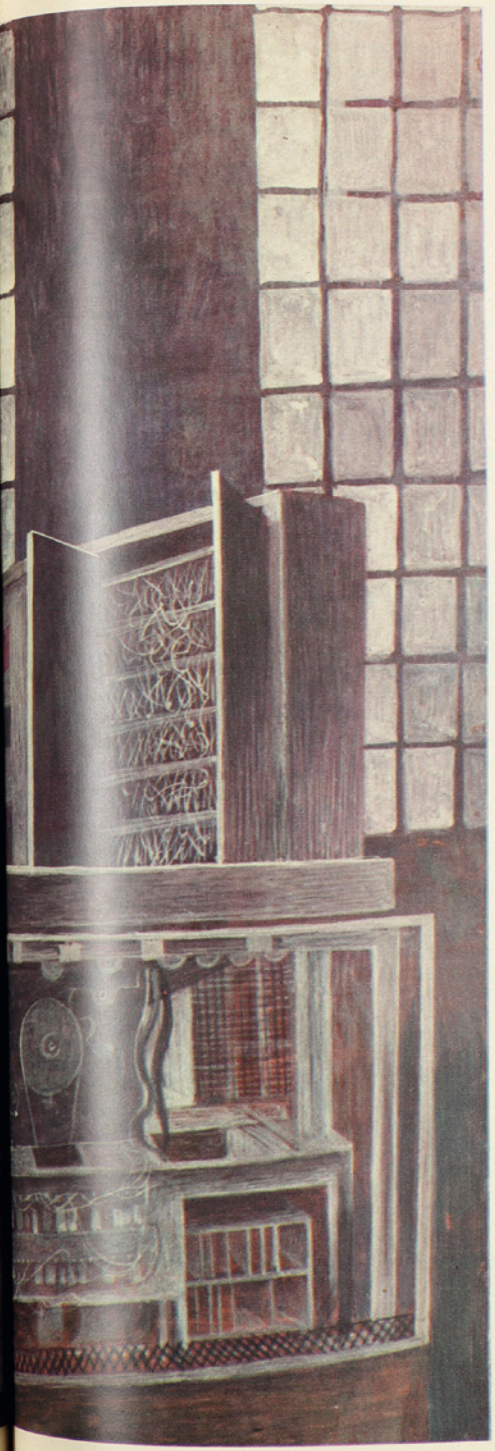
ALEXANDER ROOB / CLEMENS KRÜMMEL

Melton Prior Institut für Reportagezeichnung

Die Bildstrecke ist eine Zusammenstellung von Illustrationen, die in den späten 1950er und frühen 1960er Jahren in dem US-amerikanischen Wirtschaftsmagazin *Fortune* veröffentlicht wurden. Es handelt sich um eine Auswahl aus einer Zeit, in der gezeichnete und gemalte Illustrationen neben den durch neue Drucktechniken immer verfeinerter werdenden Fotoreportagen noch einen besonderen ästhetischen Stellenwert für sich beanspruchten konnten. Neben der banalen Tatsache, dass ein gezeichnetes Bild durch die Charakteristik einer künstlerischen «Handschrift» ein viel stärkeres emotionales Identifikationsangebot, oft sogar eine Art Komplizenschaft zu etablieren vermag, verweisen diese Bilder zurück auf die damals schon hundert Jahre alte Berufstradition des Reportagezeichners. Diese Zeichner, die zu ihrer Blütezeit in der industriellen Revolution von ihren Arbeitgebern, den großen illustrierten Zeitschriften, als sogenannte *special artists* beschäftigt wurden, stellen ein Übergangsphänomen der Moderne dar. Sie stehen für ein besonders geschultes Beobachtungswissen und eine ästhetische Sensibilität und beanspruchten für sich oftmals durchaus Kunststatus. Bilder wie die hier gezeigten verdeutlichen die Nähe der Bildsprachen zu Entertainment, Werbung und Wissenschaft, die zu dieser Zeit einen ersten Höhepunkt erreichten.

Das Düsseldorfer Melton Prior Institut, gegründet 2006 als private Forschungsinitiative des Künstlers Alexander Roob und des Kunsthistorikers Clemens Krümmel, will Grundlagen für eine international ausgerichtete Erkundung der Geschichte solcher «Reportagezeichnungen» liefern. Zurzeit besteht das Institut, das nach einem britischen Reportagekünstler des späten 19. und frühen 20. Jahrhunderts benannt ist, aus einer wachsenden Sammlung von Originalzeichnungen, Drucken und Portfolios sowie aus einer Spezialbibliothek mit einem Schwerpunkt auf der Frühphase der westlichen Illustriertenpresse. Das Institut organisiert Tagungen und Ausstellungen und publiziert in unregelmäßigen Abständen Forschungsergebnisse, vor allem auf der Webseite *www.meltonpriorinstitut.org*.

Paintings by Bernard Perlin



Shortly after this electronics giant was put together it lost its headstart in the computer business. Sperry Rand is still merging its many talents in this field. Some ex-I.B.M.'ers may help it to a better profit position.

Sperry Rand: Still Merging

It certainly looked like a fine merger. One of the partners was a leading producer of electronic weaponry, hydraulic equipment, and farm machinery. The other was the second-largest manufacturer of office equipment on a broad line and was also No. 1 maker of computers for business use. The prospects were good for a nice balancing of military with civilian business, a healthful diversification for both companies, and—perhaps most important—a golden opportunity to combine the electronic know-how of both companies to do big things in the brand-new field of electronic data processing for business.

But it hasn't worked out that way, at least not yet. The merger of Sperry Corp. and Remington Rand five years ago was a merger that is still merging. True, sales of Sperry Rand have risen impressively: from about $700 million in 1955 to nearly $1 billion at the end of the company's last fiscal year on March 31, 1959. But after-tax profits as a

Final testing of this Univac is a two-month job on two shifts. This new and successful solid-state (transistorized) computer is being produced by the Remington Rand division of Sperry Rand at the rate of five a week. Univac's high-speed printer, seen at far left, spews out 600 130-character lines a minute.

Self-propelled baler (uses twine or wire tie) is at the top of the New Holland division's line of agricultural implements. The machine shown here is equipped with New Holland's new side thrower, which automatically tosses big or little bales into a pickup. This Sperry Rand division makes nearly all kinds of grain-land farming machinery except tractors, plows, and other low-profit items. It consistently produces profits.

"White rooms" are standard equipment at Sperry Gyroscope and Ford Instrument, which Sperry Rand makes high-precision gyroscopes, accelerometers, and other equipment that can be thrown out of kilter by a speck of dust invisible to the naked eye. To enter a white room, employees go through two anterooms. In the first they don white nylon coveralls, boots, and caps. In the second they are vacuum-cleaned.

percentage of net worth have dropped from 20.3 per cent to 8 per cent. This year sales will rise again, to nearly $1.2 billion. And, happily, earnings will go up too—to a little over $1.40 a share as against 96 cents last year. This is admittedly a tidy gain, but it must be noted that it looks as good as it does because it is based on a low point in the company's history and also that it was made while U.S. business generally enjoyed an exhilarating upsurge.

At the company's annual stockholders' meeting last July, General Douglas MacArthur, chairman of the board, did his skillful best to parry the complaints of stockholders about the dreary earnings report. There were many questions from the floor, but nobody was curious enough to ask about one section of the report, signed by the chairman and by Harry F. Vickers, president and chief executive of the company. This announced the appointment of Dause L. Bibby as a director of Sperry Rand and executive vice president of Remington Rand. The report noted also that other appointments to the staff had been made to strengthen the Remington Rand side of the company.

If a stockholder had taken the trouble to ask about the background of the new appointees, he might have discovered that Bibby and the others had one thing in common: they all had held important jobs at International Business Machines, where they had learned a good deal about making and selling data-processing equipment for industry. A curious stockholder, in other words, might have confirmed a hunch that the trouble lay with Remington Rand, and more specifically with Remington Rand's computer business, which is indeed the fact.

This is not to say that the trouble is necessarily permanent. The golden potential that Vickers thought he saw in Univac is still there. If Bibby and the other I.B.M. alumni can take Univac from a poor to a good second position in the industry, Sperry Rand can yet surprise its shareholders, including even its biggest individual one, Harry F. Vickers, who owns 154,216 shares. An account of Sperry Rand, therefore, must dwell largely on the problem Bibby faces as he tries to put the computer operations of this big industrial back on the track.

The underpopulated headquarters

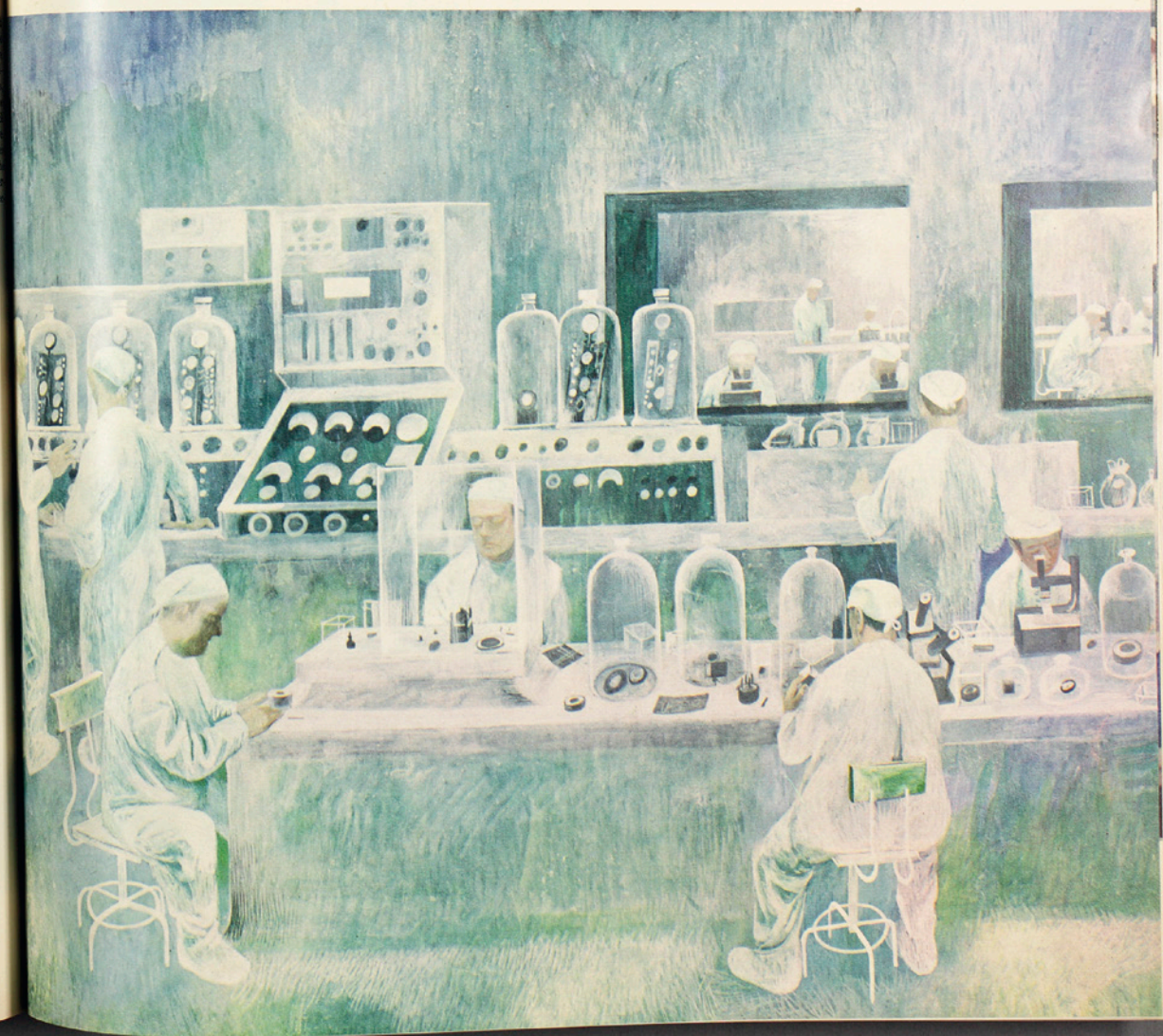
We are dealing here with a sprawling giant. Sperry Rand makes a bewildering array of products in a number of disparate fields. It has 107,000 employees, major production facilities in Great Neck, Elmira, Ilion (all in New York State), plus forty-seven others in twenty-one states and forty overseas in seventeen countries. One might begin an exploration of this complex by taking the elevator to the forty-fifth floor of the R.C.A. Building in New York's Rockefeller Center, which houses the corporate offices of Sperry Rand, and asking Miss Ruth McGrath, the pleasant and

comely receptionist, if it is all right to wander around a bit.

These are modest, comfortable, unpretentious offices. There are not many of them. They are not extensive. Only about sixty people, including office boys and secretaries, constitute the personnel at Sperry Rand's headquarters. Most of them work for the corporation's treasurer, the controller, and the corporate secretary. Vickers is quartered here, of course, and so is Kenneth R. Herman, executive vice president of Sperry Rand and president of Remington Rand. Executive Vice President Carl G. Holschuh, formerly head of Sperry Gyroscope, now charged with watching everything in Sperry Rand except Remington Rand, is the only other officer at headquarters. About all one can learn here is that the corporation could hardly be more decentralized. There are no vice presidents in charge of engineering, manufacturing, research, industrial relations, advertising, or public relations. Vickers believes that his five major divisions are so different, and their problems so involved, that there is little usefulness in having their functions represented at the corporate level. To Vickers these functions are the responsibility of his operating division heads, and he doesn't want headquarters people messing about. Furthermore, he insists that each operating divisional head decentralize as far down as practical in his own operations. So thoroughgoing a dedication to the principle of decentralization would be hard to find in any other company as big and complicated as Sperry Rand. It is nonetheless a fact that Vickers' method of operating has produced splendid profits—on the Sperry side of the business, where Vickers has been able to rely on a group of able managers.

A look at the anatomy of the Sperry side explains much, i.e., how it makes its money, and why it appeared logical for it to merge with Remington Rand. Here is a rundown on Sperry:

• The biggest unit on the Sperry side (estimated fiscal 1960 sales, $470 million) is Sperry Gyroscope of Great Neck, Long Island. Together with Ford Instrument of Long Island City (an estimated $80 million in 1960), it is deep in military business. Sperry Gyro is headed by Dr. Carl A. Frische, a physicist and inventor with many important patents. The



Rand, Vickers, and Herman know the whole story of Rand's retirement, and they aren't talking.

The first major step in dismantling the one-man show that had played too long at Remington Rand was accomplished with little or no dislocation; the many subsequent changes since have been equally gentle.

Any major reorganization in a big company is difficult under the best circumstances. In Rand the job was further complicated because Herman could find no one inside the company he could put in charge. He told Vickers that, except for a few fiscal and policy controls, there was nothing that could be done with Rand until he found a manager, not merely for Univac and the punch-card machines, but for the whole operation.

The obvious place to look for such a man, a place that has been combed over regularly by other large firms entering the electronic data-processing field, was, of course, I.B.M., which does over 80 per cent of the data-processing business. Herman called in Ward Howell Associates, a management-placement firm, and it came up with the name of Dause L. Bibby. Bibby had been an employee of I.B.M. since he graduated from the University of Texas with a degree in business administration in 1934. He had worked himself up through sales, and had been vice president in charge of all manufacturing from 1949 to 1954. Subsequently he had held other important assignments before becoming executive vice president of Daystrom, Inc., Murray Hill, New Jersey, producer of electrical and electronic instruments. The head of Daystrom, Thomas Roy Jones, was an old friend of Bibby's. Jones was planning to retire in a few years, and the idea was that Bibby would then take over. Bibby was content with his situation and prospects at Daystrom when Ward Howell approached him on behalf of Sperry Rand. Jones thought Bibby ought to investigate the possibilities: Sperry Rand was huge, and Daystrom, although growing fast, was still small potatoes by comparison.

After a series of talks with Herman and Vickers, Bibby cautiously agreed to study the situation. His first move was to appraise Rand's potential in computers. "It's obvious that I like the business-machine industry," Bibby explains, "but when you move into a new company fresh, as I contemplated doing, you have to have a realistic appraisal of that company's position, for the data-processing phase of the business had been completely dominated by the company I had left." By realistic appraisal Bibby means that he wanted to know how deeply committed Sperry Rand's officers and directors were to E.D.P. Would they keep putting up money to develop Univac, regardless of the dismal short-term profit possibilities? What results did they expect? And when did they expect them?

It was not hard for Vickers to convince Bibby that Sperry Rand was committed all the way to electronic data processing, simply because it offered the best chance for the corporation to grow importantly in the industrial area, and thus reduce the hazards inherent in military contracting. And although Sperry Rand's resources were not vast, Vickers convinced Bibby that the company could handle the early stages of a Rand buildup without outside help. Vickers also said that, no, he didn't expect quick miracles in profits.

Bibby took a look at the facilities and products he would have to work with. He was pleasantly surprised. There was plenty of plant, and although little of it was in modern, single-story buildings, it was well dispersed and located in good labor markets. Personnel in both manufacturing and sales was of much higher quality than he had anticipated. In international sales Rand was solidly established, and its overseas reputation was good—in some countries, indeed, the word Remington was synonymous with typewriter. Bibby discovered that both at home and abroad Rand's office equipment was producing splendid profits—enough to pay for Univac's losses and still keep the division out of the red.

Bibby was also impressed with the research and development that was being carried on in a dreary old Philadelphia building. He saw Univac's new solid-state machine, which was already being marketed abroad, and Randex, a high-speed, random-access memory device, usable with any Univac computer.

Finally, Bibby told himself that Univac was no worse than second in the battle of computers. So he decided to go to Rand.

Who's raiding?

Meanwhile, Kenneth Herman looked around for some more help. He got H. Gordon Smith, who had resigned as director of public relations for General Foods, to come in as Univac's director of marketing. Smith, forty years old, is an I.B.M. alumnus who had worked his way up in that

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Power-steering mechanism for tractors and earth-moving equipment is tested at Vickers' new research establishment outside Detroit. The company designed its first hydraulic devices for cars in the 1920's, sold some in the 1950's, then decided that it was a good business to get out of because of low profit margins.

Navigation unit (at far right) for the U.S. Air Force's B-58, the supersonic Hustler bomber, is hooked up to checkout equipment at Sperry Gyroscope. Each unit is tested for thirty days. In the foreground, a "line replaceable unit"—a subassembly or modular unit—that has been removed from the center of the navigation unit itself.

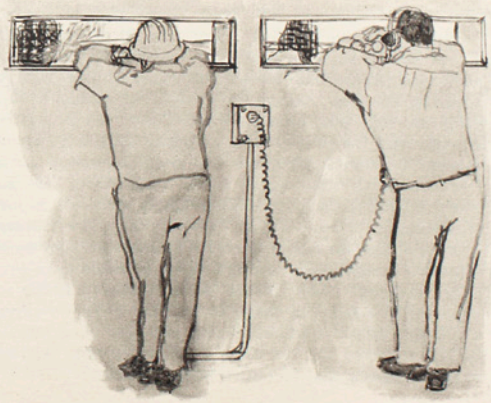

STATION 1
NAV SYSTEM

war-production effort. When the war ended, the market for JATO units collapsed, and Kimball had to struggle to keep Aerojet alive. But as the armed forces got more and more interested in rocket propulsion, Aerojet, thanks largely to von Karman's reputation and Kimball's formidable powers of persuasion, was awarded substantial development contracts, and sales rose from $2,500,000 in 1946 to $69 million in 1955.

In 1956, sales more than doubled, reaching $144 million. The main reason for this was the sharp stepping up of Aerojet's efforts to develop liquid-fuel rocket engines for the Titan, one of the Air Force's two intercontinental ballistic missiles. (The power plant for the Atlas ICBM is being developed by North American Aviation's Rocketdyne Division, Aerojet's principal competitor in the rocket-engine field.) Should the Titan be shelved in favor of the Atlas—as North American's intercontinental Navaho was recently abandoned by the Air Force—Aerojet might have to cut back its operations sharply. What is more likely, perhaps, is that the Titan will end up with lower priorities than the Atlas. But despite the magnitude of the Titan project, it will account for less than a third of Aerojet's sales this year, and Aerojet itself is widely diversified.

With the help of a technical advisory board headed by von Karman, Aerojet's 10,500 employees, who include more than 2,000 engineers and scientists, are engaged in the design, development, manufacture, and sale of one-man submarines; infrared guidance systems, among them one now being tested as an air-collision warning device for airline use; JATO units, including a model recently approved by the CAA for use on commercial airliners; underwater rocket engines; parts for ordnance rockets, including the Army's 2.75-inch Mighty Mouse; Aerobee sounding rockets; thrust reversers for jet-aircraft engines; and low-powered, $95,000 nuclear reactors. Even in the missile field, where most of Aerojet's effort is directed, the company does not have all its eggs in one basket. Besides the Titan power plant, the company is developing auxiliary power units for

Liquid-fuel rocket engines, including engines for the Titan ICBM, are tested on big steel stands at Aerojet's Sacramento plant. Above, as a test is about to begin, engineers enter a tunnel leading to a bunker from which they will observe (right) the earth-shaking blast produced by the stationary firing of a large rocket engine.



the Atlas, and is producing or developing rocket engines or other components for nine short-range missiles, including the Bomarc, Boeing's promising surface-to-air ramjet missile, which will be boosted into the air by an Aerojet rocket. Aerojet is also making the solid-propellant power plant for the Navy's intermediate-range Polaris.

With expenditures for missiles scheduled to rise steeply over the next five years—in 1960 the Air Force expects to spend more for missiles ($2.8 billion) than for manned aircraft—Aerojet's position seems strong despite present cutbacks and stretch-outs in military procurement. Indeed, investors are so taken with the company's prospects that Aerojet was able last July to sell 33,500 shares of its own common stock at $225 a share, seven times book value. Furthermore, Aerojet stock has been quoted over the counter for

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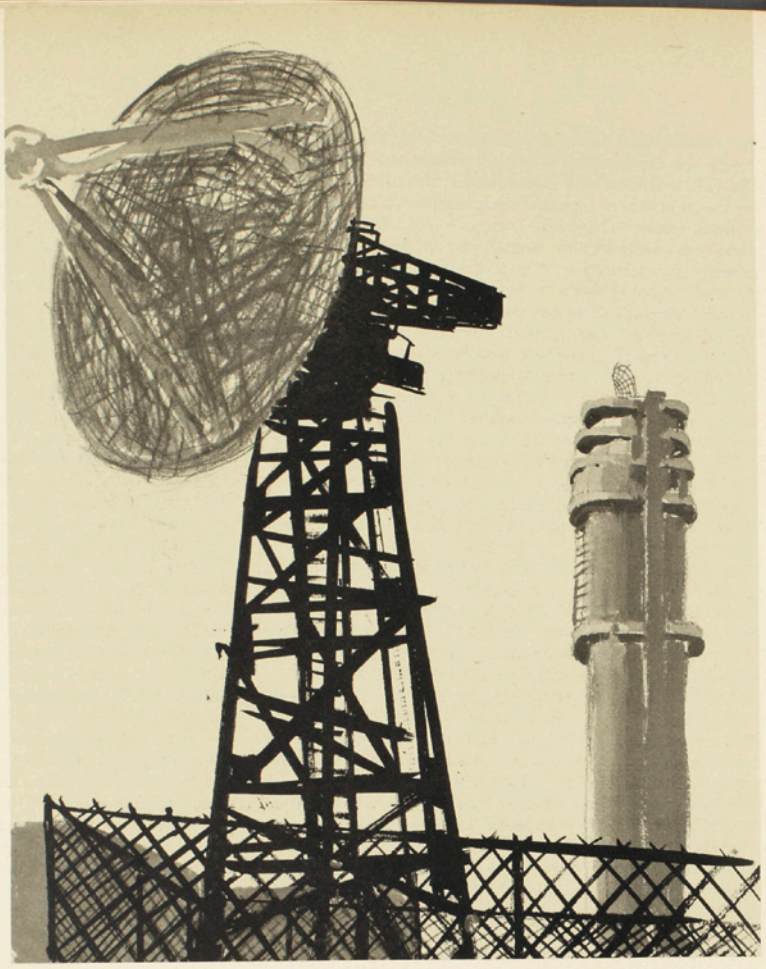


Tracking space satellites, a giant antenna scans the sky from I.T.T.'s biggest U.S. lab-and-plant complex, I.T.T. Federal Laboratories at Nutley, New Jersey. The 320-foot tower in the background houses facilities for communications research. Both plant and labs are engaged largely in U.S. defense work, and are kept under tight security control.

I.T.T. Gets the Message

by Walter Guzzardi Jr.

"There's a question how long it would have gone on before it cracked wide open. If this had gone on for three or five more years, maybe no one could have brought it back. If you let it all slide, and let operations get sloppier, then a company has to go completely downhill, all the way to the cleaners before it can come back up."

The man who spoke these harsh words was Harold S. Geneen, and he was describing, in a recent moment of reflection, the state of affairs at the International Telephone & Telegraph Corp. when he became president in June, 1959. At that time it took a man with unusual perception to see the true nature of the company's difficulties, for they were concealed behind a grandiose façade.

In the office of the newly installed president, the elegant grace of the Louis XV furnishings suggested an enterprise as perennially prosperous as the House of Rothschild. The smooth expanse of carved oak paneling allowed Geneen no room to hang maps of the empire he was taking over; but had such maps been displayed, they would have reflected a splendor of their own. They would have shown I.T.T. to be a company of extraordinary dimension and diversity. No longer principally an operator of telephone systems, it was first of all a manufacturer of electric and electronic equipment. In 116 plants operated by thirty-five divisions, affiliates, and subsidiaries in Europe, the Far East, Latin America, as well as the U.S., I.T.T. turned out the contrivances of communication: telephones, telephone switchboards, dialing equipment, air and sea navigational systems, overseas radios and underseas coaxial cables. I.T.T.'s electronic products included transistors, other semiconductors, and computers, many of them designed for such advanced uses as

Drawings by Robert Weaver

missile tracking and satellite data transmission. Moreover, I.T.T. still had impressive credentials as a telephone-operating company: under public franchise, it operated 90 per cent of the telephones in Chile, 75 per cent of the telephones in Peru, and major telephone and radio companies in six other Latin-American countries.

But a closer scrutiny disclosed the cracks. Earnings records were dismal: in 1956 consolidated profits had amounted to $28 million on gross sales of $545 million. Despite growth in volume, the net fell off to $22 million in 1957 and came back to only $26 million in 1958. In 1959 profits were $29 million on a gross of $765 million—only 3.8 per cent on total sales. I.T.T.'s commercial manufacturing in the U.S. was actually losing money: $6 million in 1959.

Worst of all, the company's future did not seem to hold any promise of improvement. Geneen set about changing that prospect. For the past year and a half he has spent almost every waking hour studying, reorganizing, firing, hiring, tearing down, and rebuilding—all with the aim of putting new vigor in a sick giant whose thought processes and reflexes belonged to a past epoch.

The troubles Geneen inherited traced mostly to the awkward efforts of I.T.T.'s founder, the late Colonel Sosthenes Behn, to adjust the company to the postwar world. Behn had steered I.T.T. through the perils of the war itself, despite the fact that up to 1940 virtually all of its properties were abroad (see page 118). Shocked by the narrow escape, Behn determined to establish a strong U.S. base for the company. When the war broke out, I.T.T. had imported some of its scientists and engineers from Europe, and gone into U.S. defense production in a number of makeshift plants, largely in New Jersey. Behn's prime objective after 1945 became the conversion of those plants into a permanent U.S. nucleus.

Harold Geneen was a passionate accountant, then a restless subordinate. Now he's a driving boss, converting Sosthenes Behn's old telephone company from fine wines to ham sandwiches—and profits.

Colonel Behn's decision to bring I.T.T. home was strategically sound. The company needed a place in the American market, not only because it promised to be profitable, but because it would strengthen investors' confidence in the company.

The trouble was that the Colonel was unfitted by age and temperament to direct his new policy. He bought companies hastily and badly. By "acquiring whatever the brokers dragged in," as one board member remarked, Behn plunged I.T.T.—a company whose main asset then was its high degree of technical skill—into the jungle of consumer appliances. In 1949 he acquired the Capehart-Farnsworth Corp., which made record players, radios, and TV sets. In 1951 he added the Coolerator Corp., manufacturer of refrigerators, home freezers, and air conditioners. After years of enervating losses, I.T.T. finally shucked Coolerator in 1954 and Capehart in 1956.

The board of directors interfered very little in the fandango of mismanagement that characterized I.T.T.'s postwar years. Not only was the board awed by the imposing figure of Behn himself, but it was also beguiled by the unrealistically favorable action of I.T.T. stock. In 1952, for example, when the company showed $22 million in earnings, the stock was selling at $9 per share; in 1959, although a 100 per cent increase in gross revenues had brought only a 30 per cent profit improvement, the stock was up 400 per cent to $45 per share—a rise from six times to twenty-four times earnings.

It's complex; it must be good

The reasons for the climb lay not in the merits of the company but deep in the psyche of Wall Street. Analysts on the Street never understood I.T.T. ("No wonder, when most of its own managers didn't either," comments a Geneen aide). But it was easy to explain to prospective stock buyers that it was a "complex company." Complexity seemed like a good thing in a complex world; the stock went up a little. I.T.T. did lots of defense work and Wall Street figured anybody dealing with Uncle Sam had great growth prospects; the stock went up some more. After Sputnik, Wall Street rushed toward electronics, and quickly ran most military electronic stocks out of sight; I.T.T. rode upward on the electronics wave.

Watching I.T.T. stock prices go up while company management went down caused some of the better-informed I.T.T. stockholders to develop manic-depressive tendencies. They clung to Behn's well-cut coattails looking fearfully down the chasms when he skidded and cheering when he was miraculously saved from the brinks. In 1948 a group of dissidents had tired of living dramatically under the oppressive genius of Sosthenes Behn. Led by Robert McKinney, I.T.T.'s most influential stockholder, they persuaded Behn to accept General William Henry Harrison (no kin to the ninth U.S. President) as president of the company. Harrison had earned his military rank in a procurement job during World War II; he came to I.T.T. from A.T.&T., where he was a vice president.

But not until 1954 did Harrison manage to wrest the day-to-day control of the company from Behn. By that time the General and the Colonel, in the words of one I.T.T. vice president, virtually "had killed each other off." Harrison, sixty-three years old, died of a heart attack in 1956. Behn died the following year, at seventy-five. The board of directors in 1956 elevated General Edmond Leavey, sixty-one, who had been with the company for five years, to the presidency. Leavey, according to one company wit, gave I.T.T. "a two-year rest." When he announced his retirement, the board appointed a committee to recruit a new president. After six months of search the committee reported back to the board with only one nominee: Harold Geneen, whose success in overhauling Raytheon Co. had won a great deal of attention from management experts.

Geneen was already a well-tested member of that special breed, the professional managers. He knew marketing and production. He was experienced in accounting and finance. Forty-nine years old at the time he came to I.T.T., Geneen also carried with him a heavy battery of other talents, which clashed sharply with the company's genteel physical and psychological decor. In the words of one of

Union Carbide, traditionally a "chemist to the chemical industry" and supplier of raw materials to almost everybody, has begun to ogle the consumer. Item: it recently paid $100 million for a sausage-casing company.

Union Carbide Enriches the Formula

by Dero A. Saunders

Union Carbide & Carbon Corp., which had record sales of $1.3 billion in 1956, is the second-largest chemical company in the U.S., as well as the No. 1 producer of plastics, of calcium carbide, of carbon electrodes, and of such key industrial raw materials as ferroalloys, oxygen, and tungsten (see box on page 125). But because Carbide turns out only three consumer products—Prestone antifreeze, Eveready flashlights and batteries, and Pyrofax bottled gas—it is probably the least-known giant corporation in American industry. This obscurity is only partly a result of the nature of its business. For years Carbide's conservative management assiduously courted anonymity, and even today Carbide's sixty-one-year-old President Morse G. Dial can hardly be accused of headline grabbing. Thus to the casual observer—or even investor—Carbide appears to remain what it has long been: a taciturn, unchanging "chemist to the chemical industry and metallurgist to the metal industry," as one of its own executives puts it.

But the appearance of changelessness is misleading. Actually, Carbide has grown enormously in the postwar years. It increased its sales of chemicals and plastics, for example, from $172 million in 1946 to some $610 million in 1956—about 255 per cent—a considerably sharper rise than that scored by top-ranking du Pont (185 per cent) or the third-ranking chemical company, Allied (138 per cent). To be sure, slightly more than half of Carbide's volume is in such non-chemical fields as ferroalloys, carbon, and atmospheric gases, which have not shown the chemical industry's capacity for explosive growth in the last decade. But even if its chemical and non-chemical sales are lumped together, Carbide's across-the-board sales gain of some 213 per cent is exceeded among the major chemical companies only by Dow and Monsanto—both of which started from much lower sales bases than Carbide.

And there are at least three intriguing signs of change beneath the placid surface. Scarcely a month ago Carbide's management parted with $99,400,000 worth of Carbide stock to buy the Visking Corp. of Chicago, a maker of sausage casings and polyethylene film—the first shift of the company's basic strategy in the direction of end-product manufacture. Carbide is also engaged in a reorganization of its research program, one of the nation's largest. And at Carbide's headquarters in Manhattan, Dial, chief executive since 1952, is about midway through a quiet but significant reshaping of the company's management structure.

The auguries for the future are for further change—and growth. U.S. output of petrochemicals, for example, has roughly doubled every five years since the end of World War II and is expected to double again by 1960 or 1961—and Carbide is the top producer of petrochemicals. Carbide's Linde Air Products Co. (Carbide calls a division a company) expects to sell twice as much oxygen this year as it did as recently as 1955, for steel mills are finding it cheaper to raise

← **Heat-interchange units,** left, at Carbide's oxygen plant at Kittanning, Pennsylvania, liquefy air by reducing its temperature to -300° F. The plant is run by Carbide's Linde Air Products Co.

A hammer blow cracks the thin coating of electrolytic chrome deposited on a sheet-metal anode at Carbide's new $120-million Marietta, Ohio, alloy plant.

Paintings by Rainey Bennett

the output of open-hearth furnaces by the massive use of oxygen than to build new capacity from scratch. Carbide's Electro Metallurgical Co. (Electromet), already the largest U.S. producer of titanium as well as of ferroalloys, expects the now rare metal tantalum to become a major new product. And the prospects for brand-new plastics are so bright that Carbide executives hint guardedly at the possibility of a major breakthrough by 1959.

The hidden pocket

Compared to Carbide's sparkling sales performance, its postwar profit record, at first glance, appears surprisingly drab. To be sure, after-tax earnings went up from $57 million in 1946 to some $147 million last year, net per share (adjusted for a 1948 stock split) from $2.03 to about $4.90, and dividends from $1 to $3.15. However, Carbide's after-tax earnings last year were less than two and a half times the level of 1946, while its sales had more than tripled. Even Carbide's before-tax return on sales was about the same as in 1946—22 per cent; and its pre-tax earnings on invested capital actually declined from 26 per cent to 25 per cent.

This apparently poor profit showing is largely illusory, however, for it reflects almost entirely a conservative write-off policy. The company's depreciation account has risen more than 600 per cent since 1946—from less than $15 million a year to nearly $115 million. Two factors explain Carbide's ability to take such massive write-offs. First, some $300 million of the company's postwar construction spending—nearly half the total amount spent over the past five years—was covered by rapid-amortization certificates. Thus Carbide's excess over normal depreciation was some $32 million in 1955 and again in 1956. And second, Carbide swelled its normal depreciation charges by adopting the "sum of the digits" method of depreciation, which allows two-thirds of a facility's capital cost to be amortized during the first half of its life. The combined effect of both factors was to understate 1956 pre-tax earnings by about $35 million, or 11 per cent.

The most sensible measure of Carbide's profit record would seem to be its pre-tax, pre-depreciation earnings. These have risen 270 per cent since 1946 (as compared with a 213 per cent increase in sales volume). They are now running about 31 per cent of sales compared to 25 per cent a decade ago. Measured against the top six U.S. chemical companies—in order of size, du Pont, Carbide, Allied, Monsanto, Dow, and American Cyanamid—Carbide's 1955 ratio was somewhat lower than that of du Pont and Dow (37 and 35 per cent respectively), but considerably above the ratio for Allied, Monsanto, or American Cyanamid.

Slag from production of ferroalloys at Carbide's mammoth new Marietta, Ohio, alloy works is tapped out into troughs, broken down into smaller chunks by the use of high-pressure streams of water, and finally dried with heat in these "dewatering bins" before being reprocessed to extract any residue of metal.

Union Carbide's Top Command

Morse G. Dial

Howard S. Bunn

Kenneth H. Hannan

President Dial, sixty-one, is one of the few Carbide top executives with outside business experience (shoes and paper). He joined Carbide in 1929, then made his way up via plastics and the treasurer's office to the presidency in 1952. (Carbide has no board chairman.) Bunn, fifty-seven, switched from alloys to chemicals to plastics before becoming executive vice president for operations in 1955; forty-six-year-old Hannan, executive vice president (staff) since last July, came up via law and finance. Creation of the second executive vice presidency was part of Dial's quiet campaign to beef up the company's central staff.

One hand washes the other

"What is the key to this corporation?" Howard S. Bunn, Carbide's executive vice president for operations, gives this summary answer: "We are equipped with a vast number of skills in research, technology, engineering, and development. No other corporation on earth has the *combined* skills that we have—though others have some skills that we don't. Du Pont, for example, can run rings around us in textile fibers. We do best by getting into a basic item and sticking with it, where our combined skills can come into play."

That interplay of skills has characterized Carbide ever since 1917, when five companies—a maker of calcium carbide, an acetylene distributor, an electrode manufacturer, an alloy producer, and an oxygen distiller—merged to form the company. A single example will illustrate Carbide's ability to create, by cross-fertilization among its components, entirely new products. Polyethylene (the squeeze-bottle plastic), which has become Carbide's most important single

product, with annual sales already near the $100-million mark, was discovered before World War II by Britain's Imperial Chemical Industries. During the war the patent was licensed to both du Pont and Carbide (see "The Polyethylene Gamble," FORTUNE, February, 1954), but production proved formidable. To start with, the ethylene raw material had to be extremely pure, which required its fractional distillation at temperatures so low that equipment made of ordinary metals became unpredictably brittle. Then the ethylene had to be put under the fantastic pressure of 30,000 pounds while cooling tubes removed the heat of compression. Carbide's early attempts at polyethylene output yielded a pound of scrap steel—in the form of broken apparatus—for every six pounds of polyethylene.

But Carbide's chemical division could seek help from the Linde division's experts, accustomed to working with temperatures as low as that of liquid helium, and from Electromet, which knew the alloys most likely to withstand any given combination of temperatures and pressures. Linde's research on synthetic diamonds (it is the largest U.S. producer of synthetic gems) had involved experimental pressures up to 100,000 pounds. This intramural cooperation enabled Carbide, working alone, to do a better job on polyethylene production than du Pont could do with I.C.I.'s assistance. As a result, Carbide supplied the top-priority war needs for polyethylene, and established an early postwar production lead over du Pont. And Carbide has kept that lead by increasing its domestic polyethylene capacity to 250 million pounds, some 40 per cent of the industry's current capacity of approximately 600 million pounds.

The recent appearance of two low-pressure polyethylene processes, one devised by Germany's Dr. Karl Ziegler and the other by Phillips Petroleum, has raised the number of entrants in the Great Polyethylene Derby to eleven. Carbide

What Carbide Makes

• **Chemicals** accounted for nearly 30 per cent of Carbide's $1.3-billion sales last year. Some 400 products (100 in tank-car volume) are made at seven major plants by Carbide & Carbon Chemicals Co. Most are petrochemicals, a field that Carbide opened up thirty years ago and still dominates.

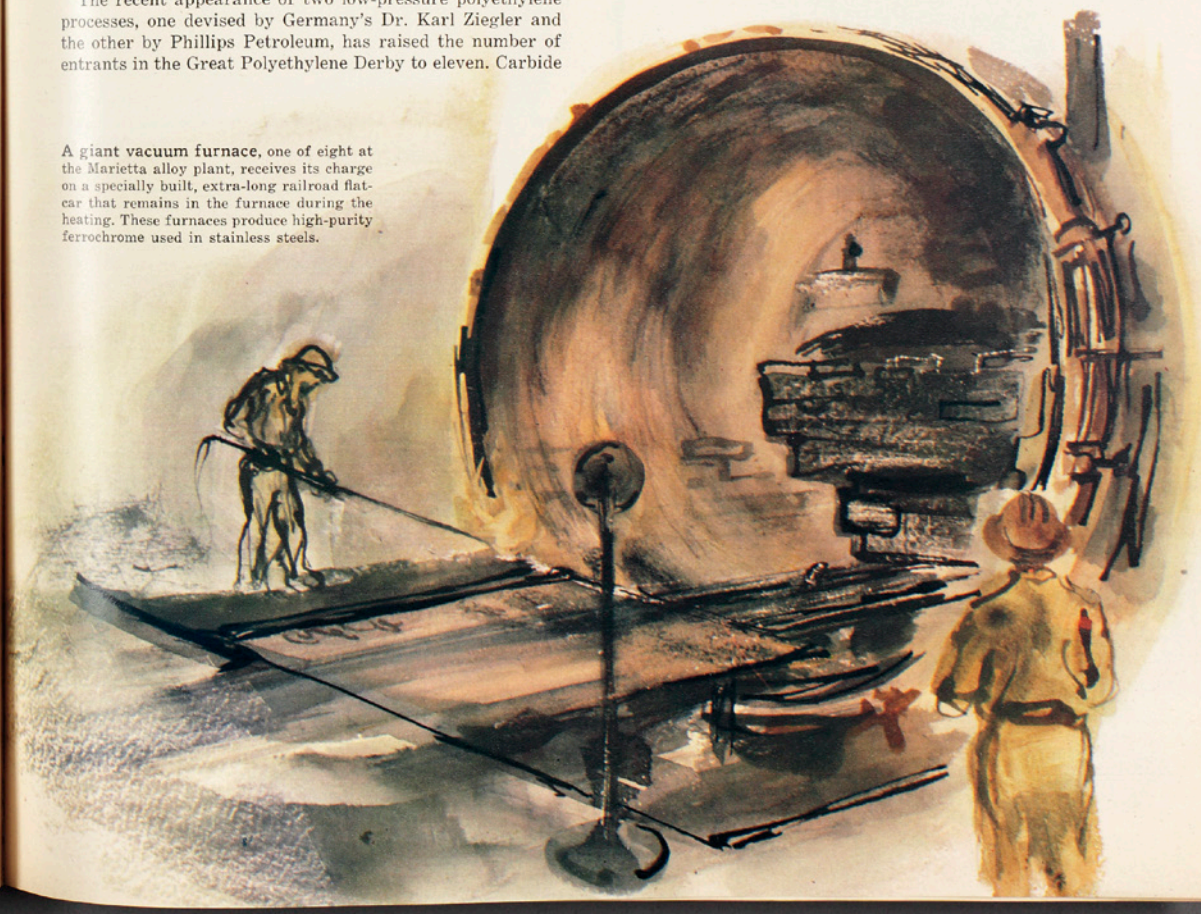
• **Plastics**, made by Bakelite Co., account for 17 per cent of total sales. Carbide sells about 40 per cent of the two most important plastics—vinyl (shower curtains, floor tiles, etc.) and polyethylene, the squeeze-bottle plastic.

• **Alloys and metals**, which account for 26 per cent of Carbide sales, are produced by Electro Metallurgical Co. (Electromet), top U.S. supplier of ferroalloys such as chrome, silicon, manganese, and by Haynes Stellite Co. With a new 7,500-ton Ashtabula, Ohio, titanium plant reaching full production, Electromet is also the biggest U.S. titanium producer.

• **Gases**, produced by Linde Air Products Co., account for 15 per cent of sales. Carbide is the No. 1 producer of acetylene (made from calcium carbide produced by Electromet) and oxygen. Linde is currently building thirty new oxygen plants to meet the steel industry's vast new oxygen demands.

• **Carbon**, which accounts for about 12 per cent of sales, is the preserve of National Carbon Co., the leading U.S. producer of electrodes, refractory carbon (i.e., bricks, pipes, etc.), and flashlights and batteries (Eveready brand). As Carbide's major channel to the consumer, National also distributes Prestone antifreeze for the chemical division.

• **Miscellaneous**: Carbide is the No. 1 operator of atomic-energy plants (it runs three for the AEC plus the Oak Ridge laboratory); a leading producer of uranium; the largest U.S. producer of tungsten; the foremost U.S. distributor of bottled gas; and a major supplier of vanadium.

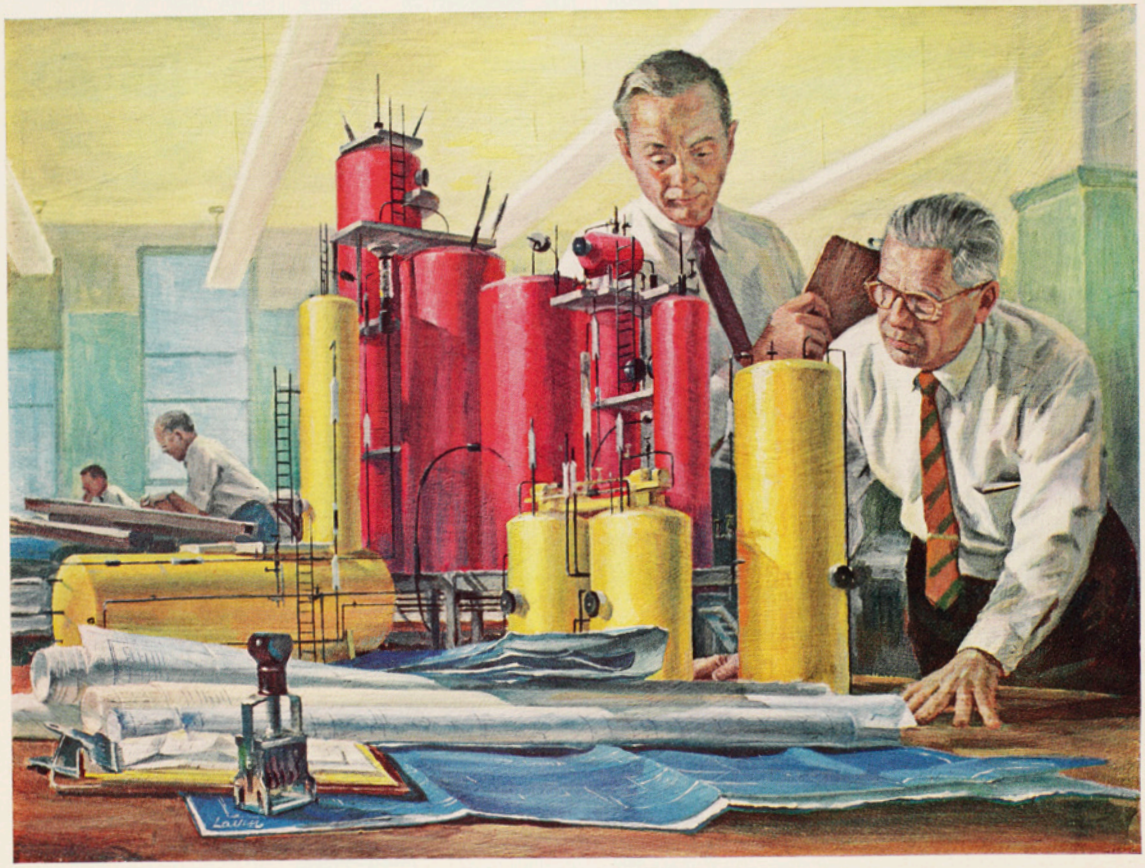


A giant vacuum furnace, one of eight at the Marietta alloy plant, receives its charge on a specially built, extra-long railroad flat-car that remains in the furnace during the heating. These furnaces produce high-purity ferrochrome used in stainless steels.

Experience passes judgment

The scale model of a chemical process plant, together with pertinent data and blueprints, undergoes one of its many reviews by the senior engineers. Knowing eyes judge, approve and reject—solving problems and smoothing the way toward construction. The men of United Engineers offer you a wealth of technical knowledge, a wide range of services—plus the hard-earned experience gained by years of serving America's chemical industry on projects of widest scope and variety. Whatever your project—process or power plant, steel mill, industrial or utility installation —the men who are United Engineers offer you a background of over 75 years' experience as designers, construction engineers, and engineering consultants.

Painting by Robert Lavin



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