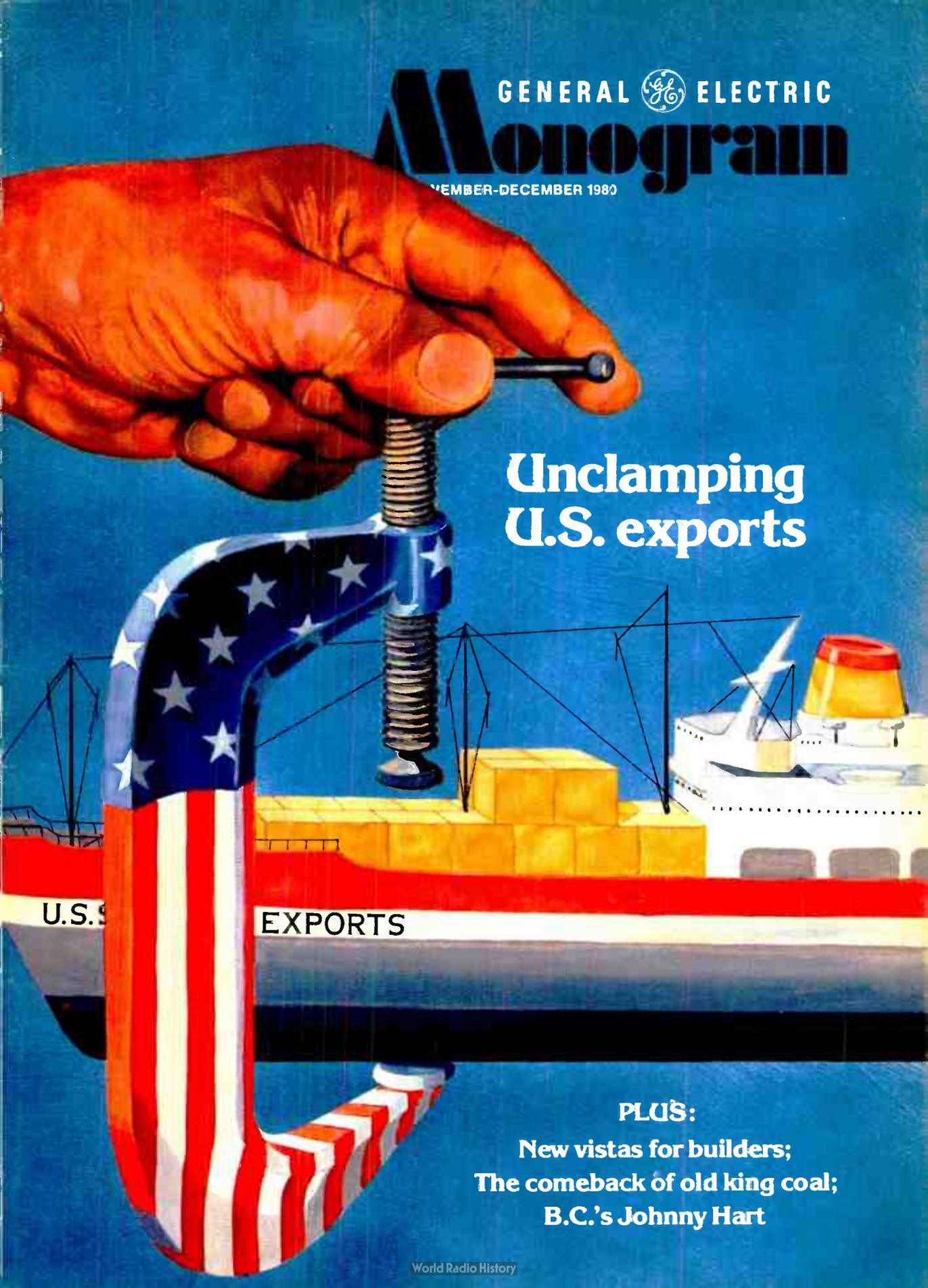


GENERAL  ELECTRIC

Monogram

MEMBER-DECEMBER 1989



Unclamping U.S. exports

PLUS:

**New vistas for builders;
The comeback of old king coal;
B.C.'s Johnny Hart**

GENERAL ELECTRIC
Monogram

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'The export imperative'

As chairman of the President's Export Council, Reg Jones leads the call for a greater 'national export consciousness.'



Flanked by Treasury Secretary G. William Miller (left) and Commerce Secretary Philip Klutznick, GE Chairman Reg Jones hammers home a key message of the President's Export Council: Expansion of U.S. exports is essential to the strength of the free world.

THE UNITED STATES urgently needs a rapid and sustained expansion of its exports of goods and service."

Thus starts a major document called "The Export Imperative," a two-volume report unveiled in Washington in mid-November that is aimed at awakening a slumbering giant—America.

Prepared by the President's Export Council (PEC), which is headed by General Electric Board Chairman Reginald H. Jones, the report's message is clear: U.S. success in accelerating exports is essential to the world's economic and political environment. Unless exports expand sufficiently, there is a real danger of restrictive import policies at home and the inevitable protectionist reactions abroad.

The report further states: "The world com-

munity will be better served by a United States that has domestic and international vitality than by a weakened giant. The strength of the free world requires strong U.S. leadership."

The result of some 17 months of work, the report recommends programs and policies to increase America's exports and to develop a "greater national export consciousness."

The PEC, which dates back to 1973, was reactivated by President Carter in the fall of 1978. The recommendations of the Council, a bipartisan board of 41 members that includes Congressional leaders as well as top men and women from the private sector, are expected to transcend the transition of the nation's chief executives and reach the desk of President-elect Reagan.

Jones, who as Chairman of GE, the nation's
(continued next page)

number two exporting company, and of PEC, is one of the country's most ardent spokesmen for a strong export policy. In December, he will hold a news conference to outline the Council's recommendations to the people of the United States.

Recognizing the Company's position as a leading exporter, the *Monogram* takes a look at the Council's report.

In the decade of the 1970s, the U.S. economy weakened. Unemployment struck high levels. The dollar lost its strength overseas, while at home inflation reached double-digit figures. And around the world, American prestige sagged. In seven of those 10 years, the U.S. recorded trade deficits and, since 1977, the deficit has been averaging \$26.5 billion a year.

What caused this decline in America? Was it due largely to a slide in trade?

For one thing, the rocketing prices of foreign oil cut sharply into the nation's balance of trade. But as the report states, the "deteriorating position" in which the U.S. finds itself in the competition for the world markets is "more than an oil problem."

Industrialized countries such as West Germany and Japan, for example, with vigorous government backing, have carved into the U.S. share of foreign markets for manufactured goods.

Notes the report: "Foreign countries are expected to emerge in the 1980s as even stronger competitive threats to the United States than they were in past decades. Therefore, the U.S. must be prepared to meet intensified foreign export competition through a major export program of its own."

Such a program, the report points out, would help accomplish the following:

- Pay for increasingly expensive oil imports and other essential raw materials;
- Reduce the country's trade deficits;
- Strengthen the dollar as the world's reserve currency;
- Provide additional jobs, not only during recessions but as an offset to the nation's chronically high unemployment levels;
- Increase the level of real income of American workers;
- Bring in foreign-source income to bolster the U.S. rate of capital investment;
- Provide industry with greater economies of scale, broader markets and powerful incentives for innovation and productivity improvement;
- Provide markets and income for U.S. farmers;
- Prevent inflationary and self-defeating pro-



GE Chairman Reginald H. Jones (left) receives the U.S. Council of the International Chamber of Commerce's first international leadership award for "initiative and leadership in supporting international trade and investment." The award is presented by Du Pont Company Chairman Irving S. Shapiro. The ceremony was held in New York in October.

tectionist measures;

- Encourage the expansion of world trade and world economic development; and
- Help restore U.S. economic, military and diplomatic credibility, and, with it, the hope for a more peaceful and prosperous world.

But if the above is to be accomplished, what needs to be done? The Council's report, focusing on key policy issues and problems which can be readily dealt with, has eight recommendations:

- Develop a national export consciousness by educating the American people on the importance of trade. This can be done by adopting a "national export goal," establishing PEC on a permanent basis, giving more responsibility to the private sector in dealing with ongoing trade negotiations with other countries, and promoting a "spirit of mutual cooperation" so government, industry and labor can better work together.
- Strengthen and integrate the federal government's international trade functions. One step here would be to consider the establishment of a cabinet-level Department of International Trade and Investment.
- Eliminate or reduce export disincentives. The nation has many laws and policies which "unreasonably or unnecessarily operate as unilateral, self-imposed disincentives on U.S. exports." Areas include: taxation of Americans working overseas, extraterritorial application of U.S. antitrust laws, unclear foreign corrupt practices laws, and inconsistent export controls.

- Improve U.S. export incentives. It is up to the federal government, while cutting back on disincentives, to provide strong encouragement and support to enable U.S. exporters to be competitive. This can be done in four areas: export financing (such as increasing the loan authorization of the Export-Import Bank), export insurance, tax benefits, and creation of trading companies.
- Reduce foreign trade barriers to U.S. exports. Large foreign markets are closed to American companies, and the U.S. must “press for further trade liberalization” and “continue to uphold the basic principles of free/fair competition in world trade” while resisting “domestic protectionist pressures.”
- Support the basic current U.S. position with respect to East-West trade. The Council feels trade normalization with all countries must remain an ultimate U.S. goal. It outlines separate recommendations in three sensitive areas: the Soviet Union, other Eastern European non-

market economies, and the People’s Republic of China.

- Increase support of agricultural exports.
- Improve the country’s overall industrial competitiveness. America needs programs that will provide the basis for greater investment which will lead to greater competitiveness, productivity and innovation. Among such programs is a tax system that encourages investment and not consumption.

Can the Council’s report start a chain of events that will awaken America and lead the country out of its present economic malaise?

The report answers: “The Council has made no new discoveries and is not proposing anything extraordinary. Rather, its hope is that by supporting basic actions that should be taken — actions that in one way or another are also being recommended by many others — we can contribute to a national consensus that, at long last, will galvanize the country to do what we know should be done.”

Championing exports

EXPORTS and General Electric go together like freighters and cargo.

Throughout the 1970s, while the U.S. was posting sizeable trade deficits, GE was consistently a leading American exporting company. In 1979, for example, sales of GE products shipped from the U.S. to unaffiliated customers were \$2.8 billion — making the Company the second-largest American exporter of manufactured goods. After subtracting GE imports,

the Company made a positive contribution of more than \$2.4 billion to the U.S. balance of trade in 1979. The positive contribution is expected to be even greater in 1980.

While competition is intensifying in the world marketplace, GE’s reputation in high technology is helping the Company accelerate its international growth.

“Diversity of our products and technology,” notes Robert R. Frederick, Executive Vice

President and sector executive, International Sector, “gives us a good match with the priorities of nearly any country, whatever its stage of economic and social development.”

Leading General Electric exports include aircraft engines, gas turbines, steam turbine-generators, engineered plastics and services of General Electric Information Services Company.

General Electric’s international role is not only working toward bettering America’s balance of trade, it is also creating jobs. Last year, some 3.4 million U.S. jobs depended on exports.

Export-related employment generated by GE amounts to about 85,000 jobs, including some 40,000 within the Company.

Indeed, international business is playing a major role in the well-being of GE and the nation.





Everett Stephens of the Booker T. Washington Foundation addresses Evendale's minority purchasing group.

Taking extra steps

Effort to help minority business enterprises gains importance under Public Law 95-507.

SIX YEARS AGO there were 316 minority-owned suppliers doing business with General Electric. Today, the number exceeds 1,000. Moreover, in that same time span, GE's purchases from minority-owned firms have multiplied seven-fold.

An impressive achievement? Yes. But the Company can do—and is doing—more.

That twin message was delivered to a group of GE purchasing personnel who gathered at corporate headquarters

in Fairfield recently to discuss the impact of Public Law 95-507 on the Company's minority purchasing programs. Passed in October 1978, the law turns what was a voluntary effort to help minority business enterprises into a mandatory program where large federal contracts are involved.

According to PL 95-507, companies cannot receive federal contracts worth more than \$1 million for construction projects, and \$500,000 for anything else, unless they've sub-

mitted their plans for using, as subcontractors, some small businesses and "small business concerns owned and controlled by socially and economically disadvantaged individuals"—a federal euphemism for minorities.

Although the law doesn't stipulate dollar or percentage goals per contract, the implication is clear: do business with minorities, or don't do business with the government.

"The spirit of PL 95-507 isn't new, it's been Company policy

for years to give all suppliers a fair opportunity to compete for our business," Vincent P. Gregg, manager — Material Resource & Traffic Operation, told the group. However, Gregg noted, a "fair opportunity" isn't always enough.

His words were echoed by GE Board Chairman Reginald H. Jones, who also addressed the purchasing personnel.

"I'm not convinced yet that we are going to bring minorities into parity status economically in the United States solely on the basis of equality of opportunity," said Jones. "Just giving them the opportunity to bid is not enough. You've got another responsibility, and that is coaching, consulting, advising—a guidance responsibility.

"If you've got a minority business enterprise that is even reasonably qualified to bid," he continued, "why not take a little time to work with them and give them some guidance? If you go that extra step, then our whole effort in this area is going to be so much more meaningful."

In addition to counseling, GE is taking several steps to enlarge its base of potential suppliers. "One of our major

objectives is to find more minority-owned suppliers, especially ones who can provide high-technology products," says Bridgeport's William H.H. Chapman, manager of Minority Purchasing for GE.

Among the steps GE is taking in this area are a national advertising campaign, minority trade fairs and a new program with the Booker T. Washington Foundation.

- The ad campaign, sponsored by the Aircraft Engine Business Group (a prime government contractor), kicked off this summer in *Ebony*, *Black Enterprise* and other publications aimed at minorities. Its message: We want to do more business with minority-owned companies. "So far we've received 107 responses, and 26 of them are potential suppliers," notes Evendale's James E. Lowry, manager—Minor Parts Procurement.

- Minority trade fairs, such as the recent Erie County Mix/Match Trade Fair in Erie, Pa., can bring hundreds of potential suppliers to the attention of GE buyers. "We have minority businessmen from three states coming to our fair, showing us their products and services,"

says GE's Robert T. Ostryniec, manager—Purchasing for Locomotive Control Manufacturing at Erie's Transportation Systems Business Division.

- The Booker T. Washington Foundation received a contract from the Department of Defense to develop a national program for expanding the amount of DOD business going to minority-owned firms. As part of its pilot program, the Foundation placed a technical representative, Everett D. Stephens, at GE Aircraft Engine Materials in Evendale—the only non-government facility selected for the program. Since last January, Stephens has forwarded to Evendale's value engineers and buyers many profiles on minority businesses throughout the U.S. Some orders have already been placed through this program.

"Programs like these and others throughout GE will help us implement PL 95-507 and further the GE spirit of progress for people," adds Gregg. "We must recognize that this law was written in the interest of our people at GE and those who will supply us with the material we need to manufacture high-quality products." ■



Above: Erie's Robert T. Ostryniec welcomes minority businesses to trade fair. At left: San Jose's Barbara Smith (standing) and Bob Wiggins (seated left) advise Harrison Taylor, whose firm supplies GE.

A treasure house of Americana

For years the million-plus photographs of General Electric's historical photo file lay moldering in the basement of Schenectady's Building Five. Now, as pictured in the May/June '80 *Monogram*, a program is under way to analyze the pictures, select those of enduring interest and re-file them in a modern storage-retrieval system. Chosen to direct this recovery operation is Professor David E. Nye, director of American studies at Union College. For Professor Nye and the graduate students helping him, this is more than just a routine restoration project. A talk with them reveals immense enthusiasm for the work — and excitement over what they are discovering among these masses of forgotten images. "The GE photographic archives constitute a unique historical resource," Nye believes. "As a historian, I see the collection as a treasure-house of Americana. GE contributions to virtually every aspect of American life in the twentieth century give the pictures great breadth in their coverage. For instance, the fact that the Company installed streetlighting on so many urban thoroughfares means that the collection gives us wonderful views of Main Streets across the country in the early days of the century." Here, in the first of a *Monogram* series on gems from this historic GE file, are examples of Americana selected by Professor Nye. ▣



Bicycles were still in favor when this group posed with Niagara Falls as a backdrop. The middle cyclist: GE's famed Dr. Charles Proteus Steinmetz.



Great expositions such as the 1915 San Francisco-Panama-Pacific Exposition gave lighting designers the chance to pull out the stops on dramatic special effects.



Main Street: Photographers assigned to shoot GE streetlighting were thorough. Here an early "projector type" Novalux unit illuminates traffic officer in Mt. Vernon, N.Y. Nickelodeon: The Hippodrome Theater in San Francisco sits for its portrait. GE's interest? Projection equipment utilized a GE rectifier.



Americanization classes conducted in GE plants helped immigrants prepare for citizenship. Bustles and hoop skirts of turn-of-the-century belles fill this display of mannequins in John Wanamaker's Philadelphia store, lighted by GE.

Monographs



75,000,000 guests. When 10-year-old Bill Julius, Jr., of Menasha, Wis., clicked through the turnstile at 2:36 p.m. on Oct. 22, he became the 75 millionth visitor to GE's Carousel of Progress, located now at Walt Disney World in Florida.

Mickey Mouse and Goofy were there to greet No. 75,000,000, who received a plaque and several awards from Walt Disney World Ambassador Monica Hallecks (right). GE Resident Manager David Harmuth (left) presented Bill with a GE portable television set.

The GE Carousel of Progress show, which portrays the role of electricity in American life from the 1890s to the present, made its debut at the 1964-65 New York World's Fair. It was relocated to Disneyland in California in 1967 and to its present location in 1974.

Double in doubles. Louisville's Irving Zeitman (left) teamed up with Ike Gumer (right) in Octo-

ber to win two American Amateur Racquetball Association doubles championships.



Zeitman and Gumer, who have been racquetball partners for five years, captured titles in the 55-and-over and 60-and-over categories. It was their second straight 55-and-over title, and third in five years.

"We're not ready to retire yet," says the 60-year-old Zeitman. His partner, a semi-retired attorney, is 67.

A technician at Appliance Park, Zeitman began playing racquetball in 1968 "to keep fit and healthy." The trim 185-pounder plays four or five times a week, and also officiates at many tournaments. His talent has rubbed off, too—his son won two national titles before turning pro.



Honors. Board Chairman Reginald H. Jones received the 1980 Gerard Swope Award, the Elfun Society's highest honor. It's given for "long and merito-

rious service to the Elfun Society."

- The Police Conference of New York presented a recognition plaque to GE for a series of ads focusing on dangers facing police officers and GE developments that can provide protection and help reduce crime. VP Douglas S. Moore (left) accepted the plaque on behalf of GE.
- Schenectady's Dr. Ralph Alpher, an R&D physicist, received The Franklin Institute's 1980 John Price Wetherill Medal for his prediction of the existence of residual cosmic black body radiation and for his work on nucleosynthesis.
- Cleveland's Robert Dorsey, manager—Lighting Technol-

ogy, won the lighting industry's highest honor—the coveted Gold Medal Award from the Illuminating Engineering Society of North America.

- When *Industrial Research/Development Magazine* picked its 100 most significant new technical innovations of the year, GE topped the list—for the 11th straight time. GE had six winners, raising its total to 129 awards since 1963.

TV special. The GE Theater will present *Omnibus*, with Hal Holbrook as host, on Dec. 28 at 8 p.m. (EST) over ABC. The performing arts special also features Princess Grace of Monaco and John Ritter.

Hot shot. Looks like basketball star Nancy Lieberman has found a new way to "warm up" for a game.

A rookie with the Dallas Diamonds, a women's pro team, Lieberman (right) joined Martha Hensley of GE Customer Relations/Dallas in promoting GE microwave ovens at the recent Texas State Fair. After telling visitors to the GE Kitchen Theater about "the ease and dependability of GE

microwave cooking," she opened her GE oven and jokingly added: "It's also a good place to keep my basketball."

To the delight of onlookers, Lieberman then demonstrated both types of skills—microwaving a tasty upside-down cake, and shooting baskets on a makeshift court. Before signing with the pros, she was twice voted the country's top women's collegiate player while leading Old Dominion to two national titles.



Mountain man. When it came time to celebrate John Turner's 50th anniversary at Pittsfield GE, his fellow employees in the Power Transformer Depart-

ment came up with one hill of an idea. They got the owner of Brodie Mountain, a local ski resort, to rename it "Turner Mountain" for the day.

Turner, shown here sitting between Employee Relations Manager Robert Campbell (left) and General Manager Randall J. Alkema, began working for GE in 1930 as a 14-year-old messenger boy. Now a production coordinator, he plans to retire early next year.

In addition to his "mountain," Turner received an album of congratulatory letters and a diamond-studded service pin. He also was feted at a special luncheon and dinner. "It was a fun day," he adds, "but the mountain topped it all."





GE engineered materials provide builders with new techniques in designing new buildings and preserving older ones. Above: New Mount Washington State Park Summit Building utilizes Lexan® sheet as glazing material. Right: Lexan sheet protects valued stained-glass windows at Bethel AME church in Bridgeport, Conn. Below: GE silicone roofing system is applied over older roof at Monument Mountain School in Great Barrington, Mass.



New vistas for builders

GE Engineered Materials Group has found a promising growth area by giving the construction industry new options.

THE STATE of New Hampshire would like to plan a new aerie atop Mount Washington, enabling visitors to be comfortable and secure as they survey the scene from the highest point in New England, 6,288 feet up, a scene that P.T. Barnum once called "the second-greatest show on earth."

But consider the problems:

- Wind speeds of better than 230 miles per hour have been clocked at the summit (more than double the wind velocity of most hurricanes);
- The temperature range extends from -47° F. to +75° F.; and
- The summit facility can expect to be in the clouds at least 60% of the time but exposed to intense sunlight at other times.

What kind of glazing can stand up to such extremes in weather conditions?

The answer is apparent in the recently completed Mount Washington State Park Summit Building, dedicated to honor former Governor Sherman Adams. Lexan[®] polycarbonate sheet was chosen as the glazing material to provide both high visibility and protection.

Lexan sheet was specified by Dudley, Walsh and Moyer Architects and Engineers, of Concord, N.H., because they knew that, with an impact strength 250 times that of glass, the glazing could stand up to the elements and retain its strength over a wide range of temperatures and humidity conditions.

In addition, it helps insure against window breakage and possible injury—an important consideration on Mount Washington because ice buildup on radio towers is often blown free by the high winds.

While demonstrating Lexan sheet's high-performance properties, the Mount Washington Summit Building also has a larger significance: It dramatizes the new options that GE engineered materials are supplying to architects and builders.

In New Hampshire, the product's strengths
(continued next page)



GE silicone sealants are being used in some of the world's most exciting new structures, including: above, the "Crystal Cathedral" in Garden Grove, Calif.; and, below, the John F. Kennedy Memorial Library on the waterfront in Boston, Mass.



gave the architects the freedom to incorporate many windows in their design. They took full advantage of it, installing no less than 90 triple-glazed windows to give visitors breathtaking views of the Presidential Range and, on a clear day, the Atlantic Ocean 75 miles away.

So it goes with many other challenging construction projects today: GE engineered materials are at the heart of liberating new building techniques.

Lexan® sheet is being specified increasingly in structures where safety and security are paramount and where window breakage due to vandalism is a problem. Schools are prime markets, but among other growth markets are churches with stained-glass windows. The glazing offers a protective shield for windows that would be costly, if not impossible, to replace.

Spokesmen for Lexan sheet are also emphasizing that their product offers better insulating properties than glass. In this energy-conscious world, that is a plus not lost on architects and builders.

Another GE sheet product, Lexgard® bullet-resisting glazing, gives building planners a new approach to solving such high-security problems as bank tellers' partitions and the windows of drive-through banking facilities.

The much-publicized "Crystal Cathedral" in Garden Grove, Calif., underscores the contributions of another family of the Company's engineered materials—GE silicone sealants. The

Cathedral is only one of scores of buildings, both in the U.S. and abroad, for which the builders have specified GE sealants.

The reasons for selecting these GE products are evident in the playbacks from builders' experiences. Silpruf® silicone sealants, for example, provide both sealing and weatherproofing in one installation. They maintain outstanding weather resistance through wide temperature extremes. They are flexible yet firm in holding glass curtainwalls in place despite the torque of high winds. And the sealants facilitate cost-savings—witness the report of one West Coast contractor: "The men said that the workability of the material is exceptional, and we were able to increase our output on this job about 15%."

In Charlotte, N.C., the new corporate headquarters for Piedmont Natural Gas Company represents still a further advance in the use of GE sealants that is stirring widespread interest in the construction industry. It is the first building in the eastern U.S. to utilize a new glazing method which requires no metal clamps, channels or framework to hold its glass sheets in place. Instead, the sheets are secured by GE silicone sealants.

The savings in construction are considerable. But in addition, the new technique is another important energy-saver, since the reduced amount of metal exposed to the weather means less transfer of heat and cold into the building.

The Group's silicone technology is also at work in GE silicone roofing systems. Spray-applied, the GE system consists of a seamless blanket of light-weight rigid urethane foam coated with silicone rubber. It offers exceptional insulation and weathering performance.

A host of other contributions are being made to construction projects by the products of the GE Engineered Materials Group beyond these major applications of Lexan sheet and silicone products:

- GE resin bolt anchors, developed originally to shore up the ceilings of mines, are steadily broadening their range of applications, from strengthening old stone bridges to adding stability to high-rise structures by binding concrete castings more powerfully together.
- Man-Made® diamonds are



At new Piedmont Natural Gas Company headquarters in Charlotte, N.C., General Electric silicone sealants rather than metal frames hold glass in place.

busy throughout the construction scene. Saw blades edged with the GE industrial gems cut through marble and granite slabs. Stratapax® drill blanks are used wherever drilling jobs are tough—even on the ocean floor. Big grinding machines use GE diamonds in highway construction to groove the surfaces so as to help prevent autos from “hydroplaning” in wet weather.

- Carboloy® cemented carbides also provide superior cutting and drilling capacities at construction sites. These tough man-made products were used, as an example, to punch through the frozen ground in laying the Alaska pipeline.
- And GE rechargeable batteries and laminated circuit board materials find a wide range of construction applications, from keeping warning lights blinking to powering hand tools.

To the management of the Engineered Materials Group, all of these diverse uses in construction make exceedingly sweet music. As Charles R. Carson, Senior Vice President and group executive, told a *Monogram* reporter recently at his Worthington, Ohio, headquarters: “While construction applications account for only about 10% of the Group’s total sales revenue, they form a very active and promising part of the whole.”

Construction markets seem positioned for growth as the recession gives way. “GE economists tell us that we can expect construction to improve in 1981,” Carson said. “Contract awards for business structures have already turned up, indicating a rising trend for commercial buildings in the months ahead. While industrial construction remains weak, the worst of the decline is behind us. It’s the same with housing. Every day the recession continues adds to the pent-up demand for housing. Housing starts have already bounced back from their low levels and will continue to strengthen, if interest rates don’t go out of sight.”

But Carson makes it clear that growth for the GE engineered materials businesses in construction isn’t only a product of market conditions: “Our prospects are strengthened by penetration into new areas of the market. Our approach is to work closely with architects and construction engineers, informing and showing them about what our products can do through application development. Together with these specialists,



VP and Engineered Materials Group Executive Charles R. Carson hears sweet music in construction trends.

our people keep coming up with new techniques, new ways to use the Group’s materials. And because of the worldwide scope of all our businesses, we have the unique ability to translate state-of-the-art developments across oceans.

“This emphasis on creating market demand through application development is standard operating procedure in the penetration of all of our served markets,” added Carson. “I credit the tremendous success we’ve experienced in the construction industry and others, both domestically and internationally, to our ability to closely

sense evolving market needs and to leverage our product technology to meet those needs.”

In addition to this technological leveraging and market sensing, the Engineered Materials Group’s multiple involvement in construction is boosted by external forces.

“Take government regulations as one driving force,” pointed out Carson. “Most government agencies and departments are pressing for greater energy efficiencies, improved safety, safeguards against flammability. General Electric engineered materials offer better solutions right down the line.

“Another driving force is the quality consciousness of today’s buyers,” Carson continued. “Our Company’s products add quality—greater reliability, longer life, the ability to withstand wide swings in temperature. For General Electric, even the impact of the microelectronics revolution on construction is a driving force—our rechargeable batteries and industrial laminates are components in systems for security, safety, communications, environmental protection, entertainment. Our silicones and insulating materials are applied in encapsulating micro-electronic modules.

“I can sum up this way: The Engineered Materials Group has five SBUs; all five serve construction; and all five have developed areas of good growth potential in construction markets.”

Chuck Carson closed his remarks with a quip: “The old saying is ‘They don’t build ’em the way they used to.’ When we see the profitable growth that comes from the interaction of our Group’s products with the construction industry currently, we can sit back and say, ‘Isn’t it nice that they don’t!’”



As coal's future brightens,
GE helps to lead the way
in coal gasification research.

The comeback of old king

KNOCKED AND KICKED about for the past two generations, hogtied with red tape and treated like the poor relative of the energy family, old king coal, the fuel that fired the Industrial Revolution, is making a comeback. A leading news magazine reports: "Coal is now being hailed as the new messiah of energy independence."

The reasons are plentiful:

- Congress has created an \$88 billion Synthetic Fuels Corporation—the largest peacetime industrial effort America has ever made;
- Federal regulations now discourage the use of oil and natural gas in most new utility power generation facilities and for many industrial processes;
- Utilities are expected to jump their demand for coal from 555 million tons this year to 959 mil-

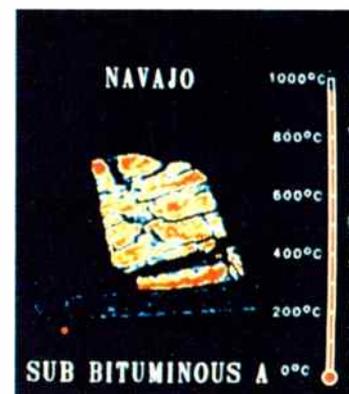
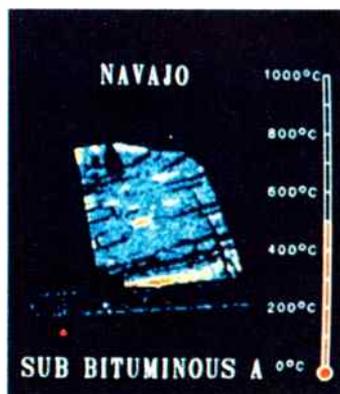
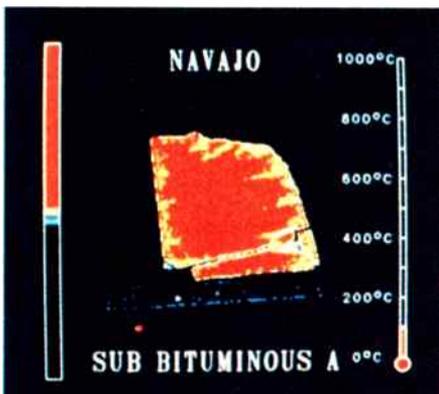
lion by 1990—a 72% increase;

- The nation's energy reserves are over 80% coal;
- The Department of Energy, which is funding numerous coal projects, including those projects to convert coal into gas and liquids, reports that coal will supply 25% of America's energy needs by 1990; and
- The world need for coal, which the U.S. can supply in much greater quantities, could help the nation's balance of trade.

One of the driving forces behind this comeback is the promise of coal gasification systems that are expected to broaden the use of coal.

States General Electric's Herman R. Hill, Executive Vice President and sector executive, Power Systems Sector: "It is vital that the nation move ahead to reduce its dependence on foreign oil supplies. Coal gasification provides

These x-ray images are probably the first recorded of coal as it thermally re-



coal



one of the most important synthetic fuel answers, allowing our Company to play a leadership role in a technology which can have wide application in the future.”

As the following examples show, coal gasification is high on a list of many energy-related projects at General Electric.

Near the Calico Mountains northeast of sprawling Los Angeles, a \$300 million project is under way to construct America's first large-scale power generation plant, converting coal into a clean gas to produce electricity. It is expected to start operation in 1983.

Partners in the project, along with GE, are Southern California Edison, Texaco, the Bechtel Power Corporation, and the Electric Power Research Institute (EPRI). Known as Cool Water because it is being built at Edison's Cool Water

generating station in Daggett, it will be an integrated coal gasification/combined-cycle (IGCC) power plant.

Points out Donald C. Berkey, Vice President and general manager of the Energy Systems and Technology Division: “The Cool Water project offers three attractive advantages to the Company. It is the cornerstone of a major market development program; the systems and control integration role will give GE the technical leadership necessary for commercialization; and the timing of the project puts GE in the vanguard of coal gasification research.”

GE is committing \$25 million to the project and is also supplying a combined-cycle unit and integrated systems controls. The combined cycle incorporates a steam turbine, a gas turbine and a heat-recovery steam generator. Some 100,000 kilowatts will be produced when gas from coal is fired into a gas turbine, and the waste heat from the exhaust system is recaptured to make steam to power a steam turbine-generator.

One of the major objectives of the Cool Water project is to show that such a plant can meet the demands of an electric power system by burning a wide variety of coals in an efficient and environmentally safe manner.

On Sears Island in Maine's Penobscot Bay, GE is involved in a project that could lead to the construction of the nation's first commercial coal gasification combined-cycle plant.

The first phase of the Maine project is a \$3.6 million, 15-month feasibility study funded by the Department of Energy (DOE) to evaluate whether or not an IGCC plant four times as large as Cool Water should be built. GE is joining the Central Maine Power Company, Texaco, and Stone and Webster Engineering Corporation in the study.

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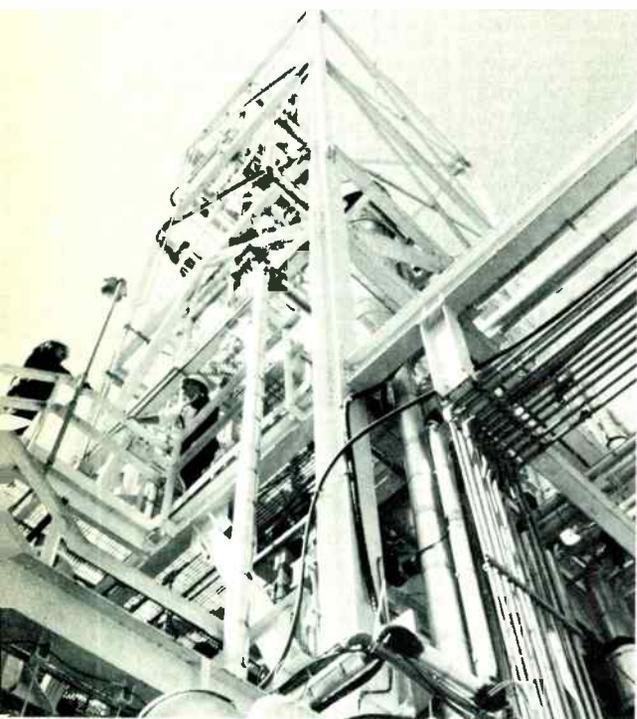
acts to high temperatures...

...and were made recently by a team of scientists from Corporate Research and Development.

Shown on the left is a nugget of coal from Utah International's Navajo Mine in New Mexico, photographed in real-time as temperatures climbed from 100 to 1,000 degrees C. This dramatic peek inside coal will help scientists understand the processes of gasification, coking and combustion, according to Dr. James B. Comly, manager of CRD's Thermal and Fuel Sciences Branch, which conducted the experiment.

The x-ray images were made with GE computed tomography scanning equipment from Medical Systems Business Division. A special furnace was used to hold and heat the coal.

In a joint effort, GE and Boeing are also using x-rays to study coal's atomic structure.



The cleanup system above was recently added to the IGCC research facility in Schenectady.

Maine is a region heavily dependent on imported oil. If the study proves a coal gasification power plant is feasible, construction will begin on a 480,000-kilowatt facility. It is hoped the plant will go on-line by 1987.

Notes Schenectady's Robert H. Goldsmith, Vice President and general manager of the Gas Turbine Division: "GE is committed to spearheading programs like Sears Island that will make the United States less dependent on oil and enable us to use larger quantities of our vast resources of coal."

On the grounds of the GE Research and Development Center stands the country's only experimental IGCC research facility which realistically simulates the operation of an advanced-design plant of the future.

The research facility became fully operational in September 1979 when a \$2 million gas cleanup system was added to remove sulfur compounds from the synthetic coal gas. The GE installation, partially funded by DOE, can remove more than 90% of the sulfur compounds, according to Dr. James C. Corman.

Corman, manager of the Research and Development Center's Thermochemical Processes Branch, heads the IGCC research and development effort in Schenectady.

Among the questions that concern Corman:

- Can an IGCC system be compatible with the environment?
- And can a gas turbine be successfully integrated with a gasification fuel plant?

At the research facility, coal is converted to a gaseous product in a gasifier; the resulting gas is then fed into a cleanup system that rids it of harmful contaminants, including particulates and other substances that could cause corrosion and erosion of the plant's turbomachinery. After being cleaned, the gas is burned in a combustor that simulates the key elements of a GE gas turbine. The entire system is under integrated computer control.

To date, with 200-plus hours of successful trial operation, Corman is pleased with the results. "For the first time anywhere," states Corman, "we have been able to demonstrate in a totally integrated system that a coal gasifier/cleanup system can deliver a fuel that is acceptable for present-day gas turbines as well as for water-cooled, ultrahigh-temperature designs now under development."

The Department of Energy has as much faith in the research facility as Corman. In September, it initiated a \$9.3 million project with Corporate Research and Development to "evaluate critical features" of the IGCC system. Applying specifically to the Schenectady research facility, the project is to establish performance characteristics for individual IGCC components from the gasifier to the gas turbine, and to explore the dynamic interactions between the components when the IGCC simulator is subjected to load patterns similar to those expected from utility operation of full-scale IGCC systems.

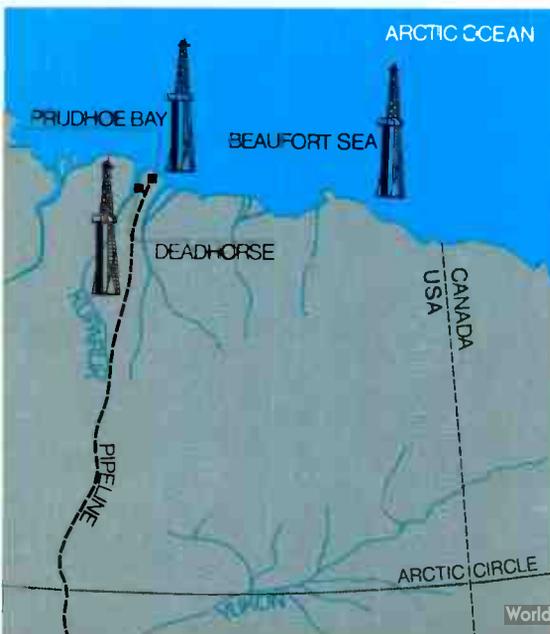
It is one of several DOE grants to GE for investigating gasification. The Company has won or proposed a dozen IGCC feasibility studies.

The other DOE contracts are:

- A two-year, \$500,000 award to develop a basic understanding of the role of catalysts in coal gasification reactions, focusing on natural catalysts such as the impurities already in coal; and
- A two-year, \$350,000 contract to investigate a novel coal gas cleanup system for removing sulfur and nitrogen compounds from the coal gas stream. This investigation will be integrated with the Schenectady research facility. ■

North to Alaska

GE is enjoying a multiple participation in the drive to make one of the coldest areas on earth a hot spot for exploration.



IT IS AN AWESOME place even in the summer: the sun high in the sky at midnight; thawing islands of ice as large as ships; a landscape unrelieved by trees or shrubs. But when the Atlantic Richfield Company struck oil at Alaska's Prudhoe Bay in 1968, which at nine billion barrels is the largest domestic discovery on record, it touched off an exodus north to Alaska that has been gaining momentum ever since.

Many oil companies are making an all-out search for new oil at home, spurred on by rising costs and uncertain supplies of OPEC crude, the risks of takeover by foreign governments, decontrol of domestic oil and gas prices, and exemption from the windfall profits tax. And nowhere has this search proved so rewarding as in the spectacular new fields along Alaska's

(continued next page)

North Slope, in the Beaufort Sea, and at the Kuparuk River, which lies 40 miles west of Prudhoe Bay.

The exploration boom at the top of the world has had an impact on other industries as well. General Electric, for one, has garnered record orders from the oil industry over the past decade for gas turbines, transformers, switchgear, drill rig motors and bits, lighting and other products.

The Company's first order, for gas turbine-generator sets to provide electricity and electrical apparatus to distribute power at Standard Oil of Ohio's installations on the North Slope, came in 1970. It was quickly succeeded by ever-larger orders for heavy equipment. Between 1975 and 1978, Sohio and Arco installed 19 GE gas turbines, 35 substation transformers and switchgear for their installations at Prudhoe Bay, and currently have another seven gas turbines on order. These newest units will be used to maintain the 1.5 million barrels-per-day production which is expected to continue for another 15 years.

Sohio was also the first oil company to make use of GE silicone anti-foam, which, when added to the oil at gathering centers at Prudhoe Bay, improves the flow along the Trans/Alaska pipeline to the storage tanks at Valdez — a distance of 800 miles through the rugged Alaska wilderness.

GE is also helping Arco and Sohio break ground in a potential new Alaska field: the Beaufort Sea. Two North Slope drill rigs have been operating with GE apparatus ranging from dc drive motors for pumps to silicon-controlled rectifiers to convert ac power to dc. Sohio's first Beaufort Sea oil rig uses similar GE electric power equipment.

The Kuparuk field, third largest in the nation, is also becoming increasingly important to General Electric. Though smaller than Prudhoe, Kuparuk's oil will not flow as easily and it is estimated that 1,600 wells eventually will be needed, compared to 120 wells now producing at Prudhoe. Arco has two gas turbines on order for Kuparuk, which will be shipped during the month-long ice-free period next July. A third unit was ordered this year and will be shipped in the summer of 1982.

The Installation and Service Engineering Business Division has worked as a subcontractor

on the installation and maintenance of gas turbine units, and sees great potential for its expertise in the years to come. Between 1980 and 1984, 80 gas turbine-generators worth \$313 million will be needed in Alaska. Many of these are on order or out for bids, representing more potential sales for General Electric.

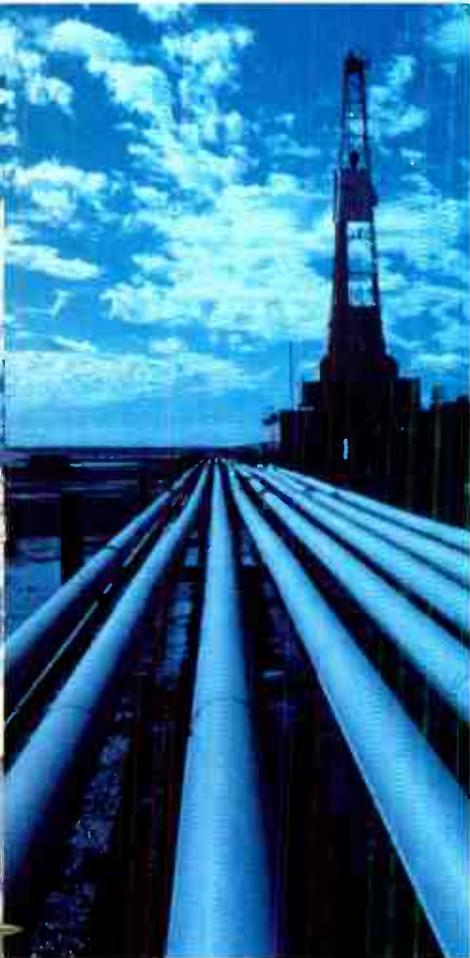
Says Gilbert M. Bosworth, a sales engineer with the Industrial Sales Division in Anchorage: "Over the next five years, GE has the potential for more than \$400 million in new orders for heavy equipment and services required to continue the development of North Slope oil and gas production. This does not include the opportunities we anticipate in areas like lighting, insulation, anti-foam and mobile radios."

Currently 15% of the country's domestic production is being derived from the Prudhoe reserves, and the Kuparuk and Beaufort fields are as yet untapped. The tremendous contribution these fields will make to U.S. energy independence cannot be overestimated. Financing and construction plans are being worked on for the development of a gas pipeline which will run parallel to the oil pipeline as far as Fairbanks, then on into Canada, following the Alcan Highway to the U.S. border, where it will route gas to the West and Midwest.

Because General Electric has built a fine reputation for its Carboloy[®] drill bits and silicone sealant in the construction of the oil pipeline, as well as for reliability in heavy drilling and power equipment, the Company is in a good position to bid on equipment for two major projects associated with the gas pipeline:

- Eight pumping stations to move the gas through the line; and
- A large gas conditioning plant at Prudhoe Bay. In this \$2.5 billion facility, 26 gas turbines are needed to provide power to remove liquids from the gas before it goes into the pipeline. Even these liquids will not go to waste, however. A plan is under consideration to build three petrochemical plants in Alaska to use them in a variety of products, and the plant construction would represent yet another opportunity for GE.

The land once called "Seward's Folly" is proving afresh that it is one of the country's most valuable assets, and a key sales area for General Electric.



GE products in the Arctic circle include (clockwise, from top left): mobile radios; gas turbines to run drive compressors at Kuparuk; drive motors and silicon-controlled rectifiers for drill rigs at Prudhoe Bay; gas turbines, switchgear, control panels, meters, relays, oil circuit breakers and transformers at Sohio power station, of which this control room is the heart; electrical apparatus to power rigs; gas turbines at Arco's central compressor plant; and silicone anti-foam, poured into pipes to help oil flow smoothly.





Hart ...a former GE

ONE DAY in the summer of 1957, a young technical artist at Binghamton, N.Y.'s Aerospace Control Systems Department, announced to his fellow workers that he would "repair to my domicile this evening and create a nationally famous comic strip." Though he had sold some cartoons to various magazines during the previous few years, his statement was met with understandable skepticism. Knowing that the artist had been unsuccessful in submitting cave-man cartoons, one wag asked, "Why don't you make it a cave-man strip? You can't seem to sell them anywhere else!"

The young artist took this as a mandate. After choosing a title, though, he was stumped for a cast of characters. "Why not use people you work with,"



artist hits it big in the funnies

his wife suggested, "and exaggerate their characteristics?" "I have a better idea," the artist exclaimed. "Why not use people I work with and exaggerate their characteristics?"

That evening, in a kitchen in Endicott, N.Y., Johnny Hart created a comic strip called "B.C." that would eventually appear in 650 newspapers and establish him as one of the most important contemporary American cartoon artists.

To Hart, who had been drawing funny pictures for as long as he could remember, the success of his strip was the realization of a dream that had begun when he was 19. That's when he had met a young cartoonist named Brant Parker, who had explained what cartooning was all about. "Before meeting Brant, I had never considered

cartooning as a profession," says Hart, "but in the years that followed, it became a driving force." The relationship between Parker and Hart culminated in 1964 in a joint comic strip called "The Wizard of Id."

Both B.C. and The Wizard of Id provide historical stages for Hart's parodies of 20th century society, B.C. highlighting a weird assortment of cave men and talking animals and plants, and the Wizard of Id chronicling the adventures of a medieval midget monarch and his loutish subjects.

B.C.'s characters, who pass their time concocting incredible inventions and speculating about civilization, include B.C., the "average cave man" who is Hart himself; Peter, a self-styled genius; and Thor, inventor of the comb and the original Don Juan.

Peter, modeled after the late Peter Reuter, Hart's mentor at GE, exhibits many of the qualities of his namesake, and is one of Hart's favorite characters. "Peter could do anything," Hart enthuses. "He taught me an incredible amount about art. He was a great concert pianist and also played jazz piano to my accompaniment on drums."

Thor, who is the cartoon embodiment of Hart's fellow GE artist Thornton Kenny, now a commercial artist with Pittsfield's Ordnance Systems Department, was constantly striving to perfect something and was also the only unmarried member of Hart's circle of friends, qualities exploited by Hart in making Thor a tinkerer and ladies' man.

How did his friends react to being immortalized in tabloid?

(continued next page)

B.C.



by johnny hart





Says Kenny: "I was terribly flattered and excited. It was fascinating to see the qualities that Johnny picked up in us that we didn't see in ourselves." His strips have brought Hart

many honors, including the Reuben Award for best cartoonist in 1968. "It was," he says drily, "the only year there was a tie for the Reuben and of course I didn't vote for myself."

Hart also treasures his more informal honors: school year-books featuring his characters, B.C. parades and golf tournaments, and the University of California's adoption of one of

American originals: The funnies, GE's Walt Kelly and Pogo



THE HISTORY of the cartoon can be traced back to the Middle Ages and beyond, perhaps even to the days of the cave man. But the art form as we know it today, as practiced by Johnny Hart and the late Walt Kelly, also a GE alumnus, was born in the 1890s when newspaper publishers William Randolph Hearst and Joseph Pulitzer battled for supremacy in New York City.

Sensationalism was the name of the game in those days, and Pulitzer, out to snare the biggest slice of the circulation pie, bought a four-color rotary press for his *World* and hired an American from Paris, Richard Outcault, to produce a cartoon. Outcault's creation—awash with color and satire—was called "Down in Hogan's Alley" and featured a bald-headed imp named the Yellow Kid. It was a stunning success.

A shocked Hearst quickly bribed Outcault away from the *World* and announced that his *Journal* would soon have a color comic weekly of "polychromatic effulgence that [will] make the rainbow look like a lead pipe."

Out of this war of colors came one of America's greatest contributions to art—the *Funnies*. Across the pages of the nation's newspapers, following the debut of the Yellow Kid, came such heroes and villains as Barney Google, Bathless Groggins, Beetle Bailey, Batman and Robin, Flash Gordon and Ming the Merciless, Krazy Kat, Li'l Abner, Mutt and Jeff, Popeye, Prince Valiant, Steve Canyon and the Dragon Lady, Smokey Stover, Dick Tracy, Tim Tyler, Wash Tubbs and Captain Easy, and, of course, B.C., the Wizard of Id and the legendary Pogo.

Before Pogo, an erudite 'possum from the Okefenokee Swamp, was born, its creator, Walt Kelly, worked for GE Bridgeport. That was back in the 1930s. When Kelly left the Company, he eventually worked his way to Hollywood as an artist for Walt Disney.

Pogo first blessed the newspapers in the late 1940s and retired in 1975—two years after Kelly's death.

Says Johnny Hart: "Walt was one of the classics—an original."



his B.C. characters—an existential anteatr—as a mascot. The school cheer is “Zot!”—the Hart onomatopoeia for both an anteatr’s tongue in action and lightning striking.

Perhaps Hart’s greatest thrill, however, came when he was chosen as an honorary ground crew member of Apollo XII—the second moon mission. Sneaking the flight manual out of the craft the day before takeoff, Hart drew in B.C. cartoons on the blank pages. Though his characters thus got to go to the moon, their journey was not without mishap: Hart recalls that just before takeoff, lightning struck the Apollo XII craft. “I remember thinking,” he jokes, “that’s one big ‘Zot!’ for mankind.”

What does the future hold for Johnny Hart? “I’m becoming more and more interested in animation,” he says. “That’s the way to really see your characters come alive. Right now, I’m working on a B.C. Christmas TV special and a Wizard of Id movie.”

Can Hart offer any advice for other would-be cartoonists in GE’s ranks? “The best way to learn cartooning is to imitate someone you like for a while,” he asserts. “Your own style will start to evolve. It also helps to have some crazy co-workers you can draw on as characters.” **AV**

Organization Changes

CORPORATE

James R. Donnalley, Jr., VP—Corporate Environmental Issues Project

CONSUMER PRODUCTS AND SERVICES SECTOR

William R. Webber, President—General Electric Video, Inc.

Jacques A. Robinson, VP and General Manager—Real Estate Financial Service Operations, GECC

Fred R. Wellner, General Manager—Television Business Division

Thomas W. Burns, General Manager—Television Manufacturing Department

Richard B. Falk, General Manager—Television Component Products Department

Alan K. Hegedus, General Manager—Refractory Metals Department

Ludwig A. Huck, General Manager—Television Marketing Department, General Electric Video, Inc.

Gary L. Rogers, General Manager—Lamp Glass and Components Department

INDUSTRIAL PRODUCTS AND COMPONENTS SECTOR

Jack C. Acton, Staff Executive—Industrial Products and Components New Business Development

William J. Scarff, General Manager—East Central Apparatus Service Department

INTERNATIONAL SECTOR

Arthur V. Puccini elected a Vice President

POWER SYSTEMS SECTOR

Clyde D. Keaton, General Manager—Mechanical Drive Turbine Department

John J. Merry, General Manager—Large Steam Turbine-Generator International Department

George W. Sarney, General Manager—Meter Business Department

TECHNICAL SYSTEMS AND MATERIALS SECTOR

Donald S. Beilman, VP and General Manager—Advanced Microelectronics Operations

Michael J. Emmi, VP and General Manager—GEIS National Sales Department

William W. Wadsworth, General Manager—Silicone Sales Department

CHINA '80



A major trade fair opens the door for GE businesses seeking future opportunities in China.

THIRTY-TWO General Electric businesses, representing five of the Company's six sectors, displayed their products and services in Beijing (Peking) Nov. 17-28 at the largest trade fair ever sponsored by the Department of Commerce outside the United States.

Billed as CHINA '80, the U.S. National Economic and Trade Exhibition attracted nearly 250,000 Chinese political, industrial and scientific leaders. They came to learn what GE and 251 other participating companies — all from America — have to offer the People's Republic of China (PRC) for its four modernization programs: industry, technology, defense and agriculture.

"The Chinese want to become a modern, industrialized society by the end of the 20th century," states GE Vice President James R.

Birle, general manager of the International Sector's Far East Area Division. "To accomplish that, they're attempting fundamental, sweeping changes in their economy. It will take time. They are still sorting out their priorities, deciding which changes to make first and how to finance them."

The cost of China's modernization programs could reach \$350 billion. "Obviously, there will be big opportunities for GE during this modernization, but the potential lies down the road five to 10 years from now," cautions Birle. "What we've done at the Beijing fair is position ourselves for those long-term opportunities. It gives us exposure in China... a chance to educate the Chinese about GE, our products and our technology."

CHINA '80 and a reciprocal exhibition spon-

sored by the PRC in San Francisco (Sept. 13-28), Chicago (Oct. 25-Nov. 9) and New York (Dec. 6-21) were the first official trade exhibitions between the two countries. The U.S.-China Claims Settlement and Trade Agreements, signed earlier this year, opened the door for the Beijing fair, which will help GE establish a major presence in the Chinese market.

Exhibits at CHINA '80, held in the spacious Beijing Exhibition Hall (opposite page) next to the internationally famous Beijing Zoo, were divided into five areas: power generation and distribution, petrochemicals and processing, manufacturing, transportation and agriculture. GE participated in every area except agriculture. No other company participated in more than two areas, and none occupied more space than the 72 square meters used by GE exhibits.

Each GE exhibit carried the theme "Wherever the World Needs Technology." Besides viewing graphic panels and films describing the various GE businesses, visitors received thousands of Company brochures, product bulletins and spec sheets. In addition, the Chinese invited seven General Electric employees to present technical papers at the fair.

"It was one of the most unusual mass marketing opportunities GE has ever had," notes Richard E. Kask, manager, China Region, Far East Area Division and vice president of GETSCO (General Electric Technical Services Company, Inc.). "We made 250,000 customer contacts and had an opportunity to talk about key GE businesses with top Chinese officials."

GE participation in the fair was coordinated by the Export Sales and Trading Division. **▲**



◀ China's Vice Premier Bo Yibo tours LST-G testing facility with GE's Lloyd Johnson (center) and Richard W. Kinnard (background).

Chinese visit Schenectady

While GE was preparing to visit China, the Chinese were visiting GE.

Headed by Vice Premier Bo Yibo, a 16-member delegation from the People's Republic of China (PRC) toured the Company's Research and Development Center and its Large Steam Turbine-Generator Division facility in Schenectady in September.

The 72-year-old Bo, who is also chairman of China's State Machine Building Industry Commission, personally picked GE as one of 28 companies he wanted to visit during his stay in the U.S. He was acting as the senior Chinese official at the PRC fair that opened in San Francisco.

During the one-day visit,

the Chinese delegation met with several GE officials, including: Herman R. Hill, Executive Vice President and sector executive, Power Systems Sector; George B. Cox, Vice President and group executive, Turbine Business Group; Richard W. Kinnard, Vice President and general manager, Large Steam Turbine-Generator Division; Dr. Roland W. Schmitt, Vice President, Corporate Research and Development; and James R. Birle, Vice President and general manager, Far East Area Division, International Sector.

The Chinese were briefed on GE's overall corporate planning. In addition, they discussed a variety of business and production matters involving heavy equipment, a crucial element in China's modernization programs.

PERSPECTIVES

Silver anniversaries

After 25 years, two GE programs to recruit and train manufacturing and marketing managers are still going strong.

JUNE 24, 1955. Inside Schenectady's Van Curler Hotel, the late Nicholas M. DuChemin, then a General Electric Vice President, told the Manufacturing Training Program's first graduating class that "there will be, because of the reputation which you pioneers acquire, a ready and even eager market for the graduates of this program who follow you."

Today, the Van Curler houses a community college and the program is called the Manufacturing Management Program (MMP), but DuChemin's prophecy rings true. Almost half of GE's annual requirements for manufacturing managers and higher-level individual contributors are filled by MMP alumni. Among its 4,692 graduates are four corporate officers and 14 general managers.

Now celebrating its silver anniversary, the MMP averages 200 graduates per year—up considerably from the first class of 84. Participants, mostly college recruits with technical degrees, spend two years in the program—handling two six-month assignments at one GE location and two other six-month assignments at another location. The assignments cover the five areas of the manufacturing function: plant engineering, factory management, quality control, materials management

and manufacturing engineering.

"The program gives participants experience across the manufacturing function by exposing them to three or four of those areas in two different GE businesses," says Fairfield's John C. Evans, manager, MMP. Graduates can apply for manufacturing management and technical positions open at any GE location.

Also celebrating its silver anniversary this year, the Technical Marketing Program (TMP) annually recruits and trains about 150 application engineers and

general sales engineers to become future sales and marketing managers.

"TMP has become the main channel into GE for technical sales and marketing personnel," notes Bridgeport's Ronald J. Bach, manager, Professional and Salaried Relations Operation in the Industrial Products and Components Sector.

Participants in TMP usually receive two years of diversified training in one of 10 career development areas they can select, ranging from electric utility sales to industrial sales. The program includes formal classroom studies, product training, plant and field assignments.

"You really become knowledgeable about the departments and products you work with, a training you can't get anywhere else," says 1979 TMP graduate Carol Jacobson, now a sales engineer assistant with Apparatus Distribution Sales Division in Meriden, Conn. She's one of 3,672 graduates of TMP since it began in 1955. 



Kathleen and Richard Hendricks, both 1980 MMP graduates, discuss their new jobs at Lynn with John Gulla (left), manager, Resource Planning & Industrial Engineering, and Roger Shepard (standing), manager, Lynn Materials System.



Unlocking your creative potential

A new Crotonville workshop explores how.

IDEAS. INSIGHTS. Creativity. From such mental triumphs spring new products, new processes, improved solutions to problems and better ways of doing things. Since Edison set a giddy pace for invention over 100 years ago, creativity has characterized many of General Electric's most notable achievements.

"Creativity is a very precious commodity, but fortunately it's something that's available to all of us," comments W. E. (Ned) Herrmann, manager of Crotonville's Manager Education Operation. "Everyone has creative potential, and every organization has creative resources. The important thing is to find ways in which we can increase our creative thinking and apply it to our work and our lives."

The nature and source of creativity has absorbed Herrmann over the past four years. His particular interest is in how it can be released in individuals. This has led to the creation of an innovative new workshop called "Applied Creative Thinking" (ACT) that was successfully pilot-tested a year ago and has now graduated nearly 100 participants.

A basic premise of the ACT workshop is that creative thinking is definable, teachable—can be learned and applied to specific tasks and issues.

An important aspect of the course is that it occurs in a working atmosphere that encourages the creative process. To achieve this environment, the ACT workshop is held at the Monroe

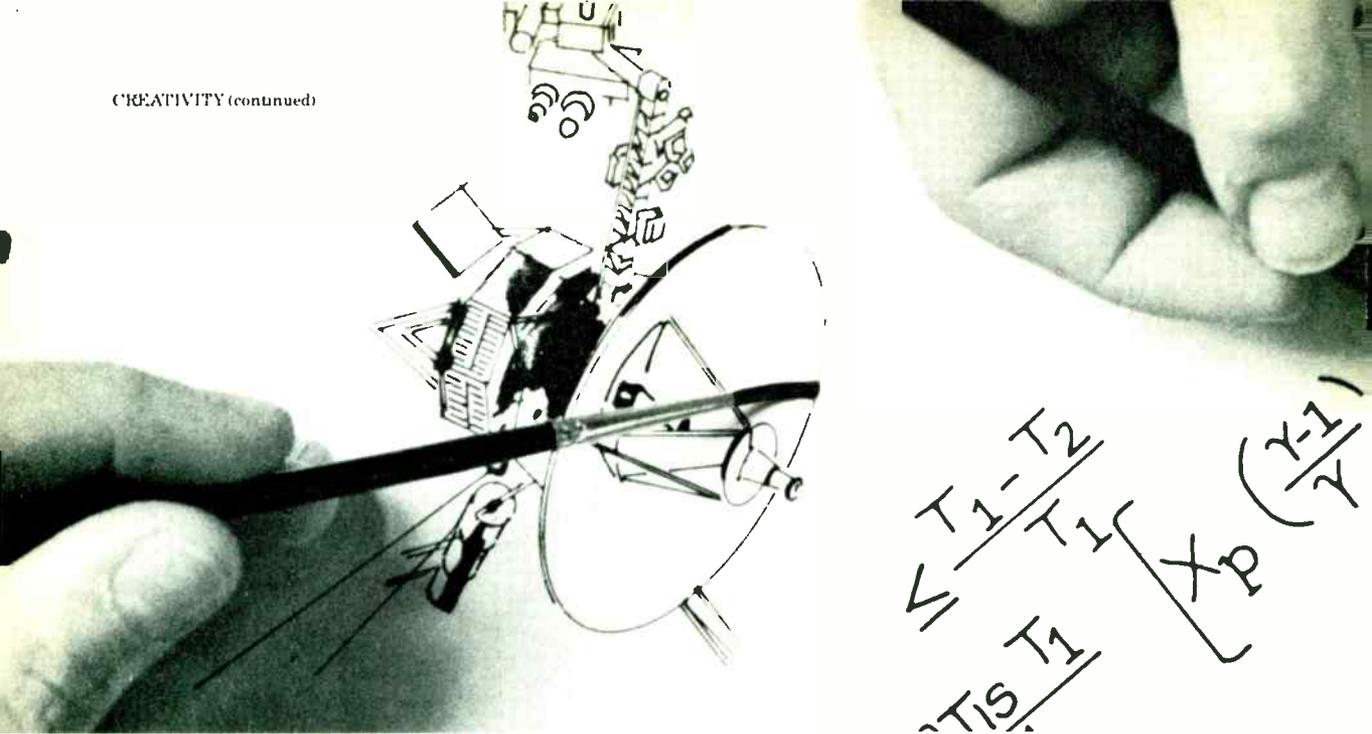
Conference Center, a unique facility snuggled in a pastoral setting near Charlottesville, Va.

In designing the workshop, Herrmann has drawn upon hundreds of sources covering the creative process, retaining the best approaches to teaching creativity. To this he has added new approaches that have recently become available as a result of a better understanding of the mental processes involved (*Monogram*, Mar.-Apr. '77). The result is a unique learning design with the potential to help release the individual's creative potential: one that involves participants in real problem-solving challenges both singly and in groups. Additionally, the course discusses the importance of motivation and the role that various people in an organization have in the creative process.

"Creativity is a mental process," comments Herrmann, "and understanding it is a key to achieving creative potential. For example, we must use both our analytical and logical strengths as well as our artistic and emotional resources."

An excellent example of this balanced thinking is provided by Albert Einstein, who first conceived his theory of relativity by imagining himself riding alongside a beam of light. The proof of his theory was worked out mathematically over the years following his visualization of the concept.

(continued next page)



What's creativity? The definition can be very personal and may take many forms depending upon the situation, says Herrmann. "Creativity can be thought of as a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, etc.; identifying the difficulty; searching for solutions, making guesses, formulating hypotheses about the deficiencies; testing and retesting these hypotheses and possibly modifying and retesting them; and communicating the results."

While there are numerous points of view on just how the creative process occurs, the ACT workshop is modeled after researcher Graham Wallas' paradigm. This suggests a specific sequence of events: preparation or saturation, incubation, illumination and verification.

Explains Herrmann: "Preparation is the stage during which the problem is investigated in as many directions as possible.

"Incubation is the interval following from conscious preparation. This stage involves actual mental relaxation where one allows subconscious thought to take over.

"Illumination marks the point where we realize a solution to the problem and is commonly known as the 'aha!' experience.

"And verification is the process of checking out the potential solution against the original problem. We've augmented this four-step process with an additional stage that we call 'toward verification' between illumination and verification. This step is when ideas can be tested, and

leads to the last stage, where solutions can be applied."

How well we utilize each step in the creative process determines how effectively we're able to move embryonic ideas from their rough early stages and turn them into accepted, workable approaches. The best idea in the world is worthless if it isn't "sold" effectively. So, the complete understanding of the creative process is essential if we're to improve our level of performance.

"There's a great deal that each of us can do to increase the likelihood of creative solutions to our problems," says Herrmann. "In the first step, in which we define the problem, for example, our preparations might involve exploring a problem in as many different directions as possible. We could try to visualize it, use metaphors or build a model. The greater the diversity of search, the greater the creative potential."

The richer our knowledge and experience, the richer our opportunities for creative problem-solving. Creativity experts emphasize the importance of expanding our horizons, and developing a healthy curiosity about things beyond our immediate field. We can read widely. We can open ourselves to new experiences and stimuli, and heed the words of Louis Pasteur: "Inspiration is the impact of a fact on a prepared mind."

The right climate can profoundly influence creativity. If we're encouraged to generate various ideas without fear of ridicule ("That will never work!"), the number of useful approaches will rise accordingly. Withholding evaluation is one of the principles behind 'brainstorming'



advocated by Alex F. Osborn (the 'O' in the BBDO advertising agency) in which group members are encouraged to "freewheel it," generating as many ideas as possible and exploring all conceivable alternatives. Quantity of ideas is the sole criterion and goal.

"The creative individual often takes risks in proposing things that are quite unique, unexpected, or unsettling to the status quo," points out Herrmann. "So, if a climate is to encourage creativity, it must allow people to take risks by removing their fear of being wrong."

Once an individual has generated several ideas, judgment is deferred and incubation begins. This could last from a few moments to hours, weeks or longer. This is certainly the time to "sleep on it"—to step away from a tough problem, detaching the mind. During incubation, notes Angelo M. Biondi in his book *The Creative Process*, "Raw ideas are gathered together, dart about bumping into each other, shift associations rapidly and form an energetic force which, often running its course, may spark illumination."

The sudden flash of inspiration that characterizes illumination is frequently illustrated by cartoons of a light bulb clicking on over someone's head. Yet this flash is a common aspect of the creative process. For Newton, it occurred while he was sitting beneath an apple tree. However suddenly this illumination appears, experts point out that it often follows an extended period of subconscious work.

Suppose illumination brings several ideas. Which are worthwhile? The scrutinizing, weighing and selecting of ideas is a crucial step in the problem-solving process. It calls upon our judgment, and often involves one of several methods of "creative evaluation."

Criteria are keys to evaluation. They help to make specific assessments of such things as the effect of a solution on meeting objectives, its effect on people, or its effect on costs, etc. Also, weighing factors can be applied to each item to help compare one idea against another. Ideas can be ranked according to difficulty. Numerical values can be assigned to each idea to ease the selection process.

"Our creativity can produce a variety of seemingly attractive solutions to our problems," says Herrmann, "but eventually these must be submitted to critical scrutiny and verification during which our logical mental processes come to the fore."

Has the ACT workshop helped participants increase their creativity? Herrmann: "Indeed it has. Our feedback shows an enthusiastic endorsement of our workshop design. There is a Company payoff, too, since most jobs benefit from creative approaches to problem-solving. In fact, we end our ACT workshop by applying the class's creativity to a Company problem."

Sums up a senior manufacturing engineer: "This workshop has to be one of the highlights of my GE career and I can say, without a doubt, the most enlightening and meaningful workshop I have ever attended." 



SILICONE CHIC. The newest thing in jewelry is not by Harry Winston, Tiffany's or even Van Cleef & Arpels. It is Carol Motty Silicone jewelry, made from GE silicone and worn by stars like Cher and Deborah Harry of the rock group "Blondie."

The first artist to use silicone for jewelry, Motty started out as a sculptress who used silicone for casting intricate pieces. Now, with partners Norman Levenson and Kitty Wise, she makes miniature geometric "sculptures to wear," enlivening them with coloring, paint, leaves, beads, stones and glitter.

Motty's earrings, pins and stickpins (r) have been featured in *Vogue*, *Harper's Bazaar* and *Glamour* magazines, and are sold in stores like Henri Bendel, Bergdorf Goodman and Bloomingdale's. Among her most recent innovations are silicone "chips" (above) used to decorate sweatshirts, dresses and bandeaus.

