

Strengthening Africa's sinews



PLUS:

1979 Issues Climate

A rush of honors

Utah's navy

World Radio History


The 1979 'Issues Climate'

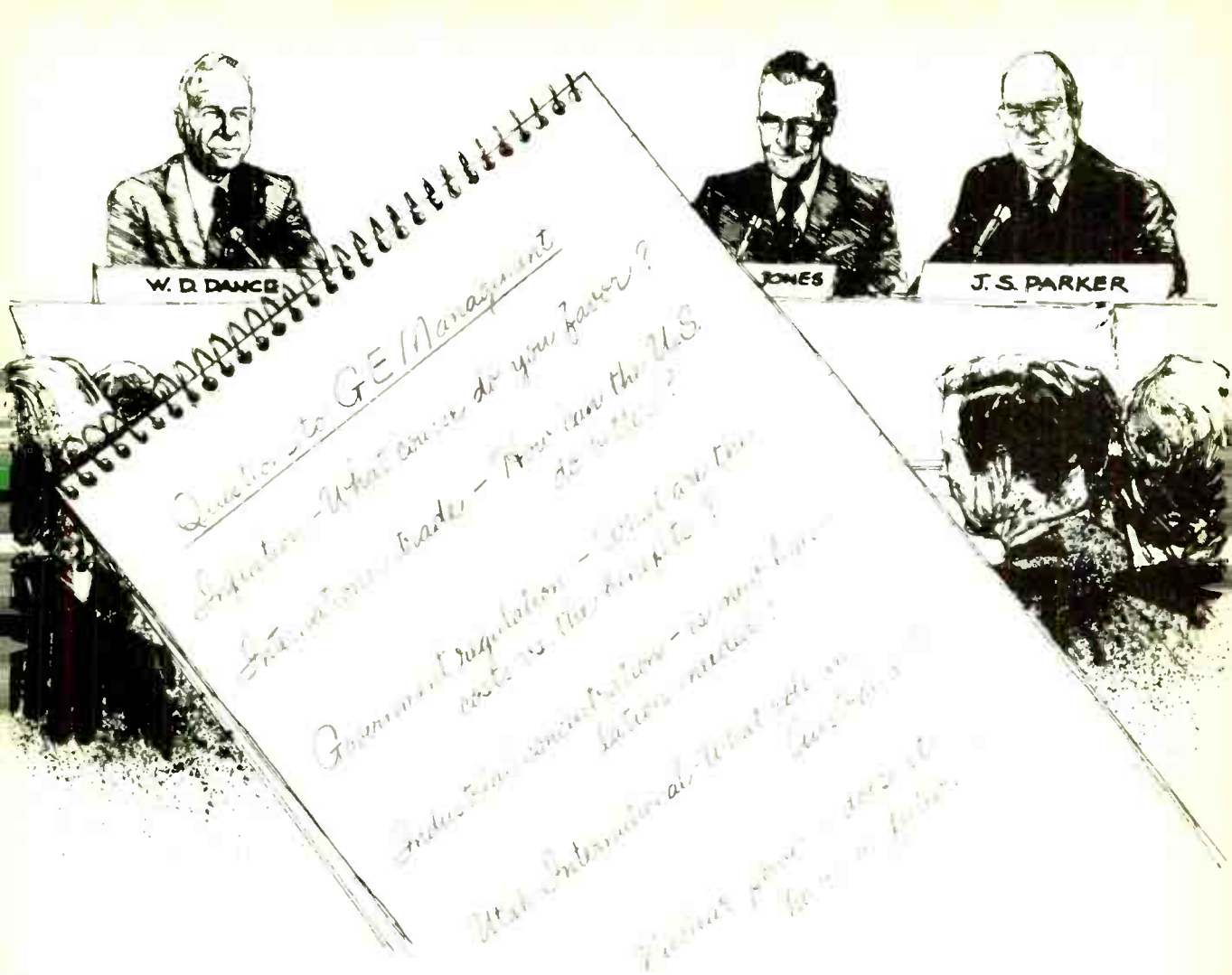
GE leaders assess several top priorities on the nation's agenda.

When members of the press assembled in New York for General Electric's annual press conference on January 25, their primary focus was on matters that have long since been publicized—including the Company's results for 1978 and management's views on the immediate economic outlook. Intermingled with these questions, however, was more durable substance: well-expressed summaries of GE positions on several of the key public issues of 1979.

Inflation—'made in Washington': Chairman Reginald H. Jones presented GE answers to why the U.S. is suffering from high rates of inflation and what can be done about it.

Business, he felt, has behaved responsibly through the up-cycle of the past few years—"keeping costs under control, keeping inventories at sensible levels, building up liquidity—all the prudent measures that prevent the excesses which produce boom and bust."

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His opinion, however, was that "I don't think we can say quite the same thing for the Government sector. We've heard much talk about restraining Government expenditures, but in fact Federal spending passed half a trillion dollars last year, and we are continuing to have huge Federal deficits in good years and bad."

The result, he said, is that "most of the current inflation is made in Washington, and it will have to be cured in Washington by means of strong fiscal, monetary and regulatory restraint."

Today's wage and price standards are, in his view, "designed to reduce inflationary expectations long enough to break the upward spiral, but they do not deal with the fundamental inflationary pressures. That is why the business community has indicated both its cooperation with the Administration's anti-inflation program and its insistence that the first order of

business must be anti-inflationary fiscal and monetary policies in Washington."

The GE Chairman added that in his contacts with the White House, "I get the strong impression that the President is firmly committed to his anti-inflationary course. The public is in a mood to support a cutback in spending and taxes, and we hope the Administration and the Congress will take advantage of the opportunity to say 'No' to those who are demanding new Government spending programs."

In answer to a visitor's question, Chairman Jones expanded on these views. He is concerned with what he called "the institutionalization of inflation"—the building-in of cost-of-living adjustments and other measures which mean that income today is, to a substantial degree, "indexed" to rise with the inflationary spiral. The result is that people are enabled to "live with inflation" and thus lose the resolve, the

(continued next page)



self-discipline and the willingness "to face up to the acceptance of a slower economy and higher unemployment in order to bring about a lower rate of inflation."

The task ahead, he summed up, is "to get across the fact that inflation, in the long run, will be considerably more damaging than any misfortune we might experience in the short run."

International trade—'expand exports': If inflation is the United States' primary economic problem, Reg Jones told the press representatives, "close behind is our badly eroded position in international trade."

The dollar, he said, "is in very fragile condition as a medium of international exchange, and the United States has run two trade deficits back-to-back at the disturbing level of some \$30 billion a year."

The American people find it hard to think of themselves as a trader nation, the GE Chairman observed. "But exports, according to the U.S. Commerce Department, provide one out of nine manufacturing jobs in this country. Those jobs are especially important when the domestic economy is slowing down and can no longer provide jobs for our growing labor force. When the economy does slow down, as is expected in 1979, then we should go all out to expand exports in order to take up the slack in employment."

But he sees this as more easily said than done. "Other nations long ago recognized the importance of exports in sustaining employment, and they offer their exporters all sorts of competitive advantages in terms of taxes, credit, bilateral trade treaties and diplomatic help in securing major orders overseas. We in the United States have been much too naive in our approach to world markets. Even as we try, through the GATT [General Agreement on Tariffs and Trade] negotiations, to reduce the barriers to U.S. products, we must also recognize that other nations are not going to surrender their advantages very easily—and so we will have to develop offsetting policies and programs that give U.S. exporters an even break in the struggle for world markets."

Chairman Jones expressed hope about the exports outlook: "Faster expansion in Europe and Japan and some recovery in the developing nations should open up better export opportunities in the period ahead. At the same time, an

economic slowdown here should cool off our rate of import growth. Thus, we do have an opportunity to cut back the trade deficit this year and start improving our international trade position."

Regulation—'assess the tradeoffs': Asked about the effect of the costs of regulation of business by Government agencies, the GE Chairman acknowledged that while the impact is very difficult to determine in quantitative terms, "we know it's tremendous." He added that Murray L. Weidenbaum, director of the Center for the Study of American Business at Washington University in St. Louis, has estimated that the total costs of Federal regulation in 1978 exceeded \$100 billion.

"In an effort to get more definitive numbers," GE's Chairman explained, "a group of companies in the Business Roundtable hired Arthur Andersen and Company to develop a methodology that could be used to look at the costs imposed on a few companies by just six agencies of the Federal Government."

Results of the study, he said, will be announced this spring. "But they do tend to confirm what we have all known for a long time, and that is that the cost the consumer is bearing is out of proportion to the benefits he is receiving."

This imbalance is understandable, in his view. "The regulatory agencies have, in effect, been given carte blanche by Congress. Congress just said 'Clean up the water; clean up the air, etc.' and didn't set limits as to the cost of these moves. In their zeal to achieve the ultimate, the regulatory agencies have, naturally, tended to err on the side of conservatism in terms of their targets rather than taking into account the costs incurred." As a result, "we haven't had cost/benefit tradeoffs considered as seriously as we think they should be."



President Carter has created the Regulatory Council to look at this issue in more depth and, the GE Chairman commented, "there has been much talk about the Council coming up with a cost/benefit tradeoff statement for all new regulation." But much remains to be done: "I think it's going to be a long battle. It's going to require tremendous education and, before we are through, new legislation." He expressed the hope that, over time, Congress will be willing to readdress this

issue and set some limits on the cost impacts.

Industrial concentration—new slants: Another press rep asked Chairman Jones to comment on the talk in Washington about possible antitrust legislation that would limit business mergers.

His reply: "It's our feeling that Section Seven of the Clayton Act is all that is required. Effective enforcement of Section Seven could preclude the kinds of damage to the economy, through lessened competition, that we have always been concerned about in this nation, and we don't believe that any further legislation is in order."

The GE Chairman found it interesting that the proposed legislation is built on the myth, advanced through the years by "structural" economists, that industrial concentration leads inevitably to price-gouging the public. "Yet, in all the time that these economists have advanced all these concepts, they have never really done any homework that has proven that concentration has been damaging."

Now, he said, a whole school of new learning is being developed by economists such as Harold Demsetz, George Stigler, Yale Brozen, Oliver Williamson, Fred Weston, Kenneth Arrow and others "that is challenging the myths perpetrated by these structuralists and is, frankly, destroying them."

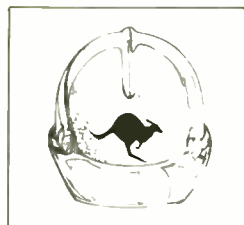
He cited the final report to the Senate by Dr. John T. Dunlop, former Director of the U.S. Cost of Living Council: "He proved that, during the period of price controls in the early seventies, the lowest price increases were in the most concentrated industries, and the highest price increases were in those that are characterized as being 'atomistic.'"

Why does this happen? Reg Jones' answer: "There is a sense of price responsibility, as a result of high visibility in concentrated industries, that is most anti-inflationary when it comes to pricing. Our own prices, in this highly competitive electrical industry, have been somewhat between a half and two-thirds of the price increases in both the Consumer and Wholesale Price Indexes—yet, we are considered to be a concentrated industry."

He wastes no opportunity, he said, to point out to present Government leaders that to return to an atomistic philosophy would be self-defeating. On this issue, he concluded: "We've got a major job of education ahead of us."

Utah—'asset to Australia': Asked to comment on press reports indicating that the Australian

public is critical of GE's natural resources affiliate, Utah International Inc., for being the most profitable business in that country, Vice Chairman Jack S. Parker termed the criticism "somewhat specious." Utah has a very good position in the mining business in Australia, he said, and is one of the most profitable companies there. But what the critics lose sight of, Parker



pointed out, "is the fact that the Australian Government is a far greater gainer than Utah is; that, for every dollar Utah brings out, the Australian Government receives about \$2 in tax revenues, plus another 50 cents for our use of the railroad which we [Utah] built and paid for. These are quite apart from the cost of doing business there."

In addition, the Vice Chairman noted, now that that particular mining venture is showing profits, many people tend to forget the enormous sums and long lead times that had to be invested in Australia's Utah Development Company in order to make these gains possible. "Believe me," Parker said, "Utah is a genuine asset to Australia."

Nuclear option—'it's here': A reporter's request to Vice Chairman W. David Dance was to discuss the status of the nuclear power industry. Dance acknowledged that in terms of new orders "the nuclear business has been in a holding period for some time." But he cautioned the press to discount the "anti-nukes'" claims that the nuclear option has been stopped. "It's not stopped," he said. "The nuclear option is here, today. There are 72 plants in operation in the U.S., which produce about 12% of the electric power coming off the lines."

In addition there's the hefty backlog of plants still to come into operation: "We ourselves have 46 plants in our backlog, and it will take us, probably, to some time between 1985 and 1990 to get those plants on line. By that time there will be, over all, some 200 to 220 nuclear plants operating in this country, producing some 20% of the electric power. And the Administration is even saying that they'd like to see, by the year 2000, probably 300 nuclear plants. So, the nuclear option is already here." He added: "We expect to have a very profitable nuclear fuel business for many decades ahead, and GE sees a lot of opportunity in the nuclear services industry." ▲

General Electric spokesmen have reiterated that if the U.S. is to have the energy it will need in the years ahead, the nation must pursue *all* of its viable energy options. Emphasize coal, yes. Revitalize the country's nuclear technology, by all means. Encourage domestic development of oil and gas resources, to be sure. At the same time, say GE experts, the country must keep advancing those yet-unproved technologies that show promise of providing economic power in the future. Matching deeds to words, General Electric is actively pursuing most of these more exotic energy possibilities. Here's a look at where a sampling of these longer-term energy projects stand today.

Solar: beyond the drawing boards

Hopes for solar energy as an inexhaustible, renewable energy source keep running ahead of reality. A talk with Bobby J. Tharpe at Valley Forge, Pa., is cautionary: as manager there of the GE Space Division's Advanced Energy Programs, which is conducting the bulk of the Company's solar energy R&D, Tharpe is enthusiastic about the progress he sees unfolding—yet he feels compelled to warn against over-optimism for solar.

“The costs of converting the sun's radiation into heat or electricity, plus the many challenges faced by industries and utilities in integrating an alternative energy source into existing power distribution systems,” he says, “limit the near-term possibilities of widespread solar energy applications. Realistically, solar can provide a few percent of the nation's total energy demands by the year 2000. Even a few percent, however, would be a significant and welcome assistance—and a major market for the Company.”

GE solar researchers can point both to advances in solar technology and to leading-edge examples of applications that are carrying solar energy well beyond the drawing boards.

- **A new look in solar collectors**—and a doubling in their efficiencies—have been achieved by Tharpe and his associates. In place of the flat-plate collectors that characterized earlier installations, the GE team is now in pilot plant production of cylindrical vacuum tube solar collectors. Arrays of these TC-100 Solartron® vacuum tube solar collectors are capable of sup-

plying up to 300° F. fluid temperatures in direct and diffused sunlight, and are insensitive to ambient air temperatures or wind conditions.

To help produce them, the Space Division turns to another GE operation, fluorescent lamp production in Logan, Ohio, to provide lamp glass cylinders—a residential size and a slightly larger commercial size. Two cylinders are used in each tube. At Valley Forge, the smaller cylinder is coated with a highly light-absorbent material and fitted into the larger one, which acts as a “window” for the sun's rays. Then, the space between them is sealed and evacuated to form a thermos-type bottle, thus trapping the heat.

Update on energy 'exotics'

While Advanced Energy Programs eventually expects to begin marketing its Solartron collectors commercially, the output of its “glass factory” is now going into the application projects it has undertaken. As an example, a rooftop collector field of the units was installed last year at the Cherry Hill Inn, a combination country inn, hotel and convention center located 15 minutes from downtown Philadelphia in Cherry Hill, N.J. One of the Department of Energy's largest commercial installations of solar collectors, the GE project features a “solar system” made up of 331 collectors that are designed to provide more than 25% of the domestic hot water and heat for the Inn.

Also, a TC-100 solar collecting field covering some 6800 square feet of a hillside adjoining the Riegel Textile Corporation in LaFrance, S.C., was dedicated last October. It marks the first

(continued on page 8)



Solar energy products are gaining increasing popularity as the nation intensifies its quest for supplemental power sources. At the GE Space Division in Valley Forge, Advanced Energy Programs' David Baum, solar collector factory foreman, looks over a section of one of the many 30-by-7-foot parabolic troughs that will be installed as an experimental solar project at Sea World of Orlando, Fla. Silieon photovoltaic cells are mounted on a coolant pipe along the focal line of each trough.

On the rooftop of New Jersey's Cherry Hill Inn, GE Solartron® vacuum tube solar collectors are expected to provide valuable guidelines for future retrofit solar installations.



process hot water application of solar energy within the textile industry. The DOE-funded system is used to heat water to 190° F. in an open fabric-dyeing vat, and can provide from 50% to 70% of the process heat required for a single dye unit. Industrial process hot water accounts for about 4% of the nation's total energy needs.

- **Photovoltaic solar cells** represent another technology under intensive development by the GE Space Division. Work is underway on two fronts: development of the units themselves, with a primary objective of producing new, more efficient cells; and experiments with new arrays of the units to perform specific energy tasks.

A leading example of the Division's work with photovoltaic cells is a unique, sun-fueled power plant to provide electricity and heat for marine exhibits at Sea World of Orlando, Fla. Under a DOE contract, Valley Forge engineers are designing a photovoltaic concentrator system which arranges high-intensity silicon solar cells on the focal line of two-axis-tracking parabolic reflectors. Nine giant turntables—each 146 feet in diameter—spread across a five-acre site will contain 180 such photovoltaic concentrators and rotate to track the sun's azimuth (direction from due north), while the parabolic collectors will track the sun's elevation (angular altitude above the horizon).

If the system is selected to proceed from design phase into the demonstration phase, the array of collectors will make up one of the largest solar-cell systems in the world. It will provide 300 kw of peak electrical power—enough power to service approximately 40 average homes—and 16 billion BTUs of annual thermal energy, used to air-condition a major exhibit hall.

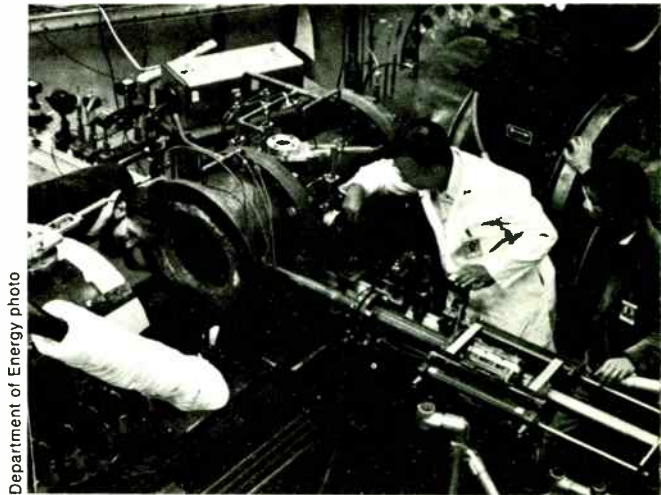
- A solar "power tower" is being designed by Schenectady's Research and Development Center, supported by another DOE contract. The concept of this solar central receiver power plant involves a field of some 20,000 mirror-like heliostats that track the sun and focus its rays at 1000 times normal intensity onto a solar energy receiver perched atop a 60-story-high tower.

Liquid sodium circulating through the receiver is heated to temperatures of up to 1100° F., then passed through two sodium-to-water heat exchangers in which steam to drive a turbine and electrical generator is produced. En route to the heat exchangers, some of the hot sodium is diverted through a large thermal storage tank that is used during periods of inter-

rupted sunlight. The tank would store enough heat energy to keep a plant running at its full 100-mw capacity for up to three sunless hours.

MHD power: high efficiency, low pollution

The concept of magnetohydrodynamics, or MHD, has been around for years: instead of using a turbine to turn a conductor in a magnetic field in order to make electricity flow, shoot hot



Department of Energy photo

Designed for use in MHD systems, the regeneratively air-cooled cyclone coal combustor undergoes inspection after a successful test at Valley Forge's Space Sciences Laboratory. Checking it over (l to r): Kenneth Dickinson, test engineer; Henry Sharp, technician; and Satoaki Omori, research engineer.

gases directly through a magnetic field at high speed. This more direct conversion of coal or other fuels promises to turn out half again as many kilowatts per unit of fuel, with less pollution, than present forms of conversion.

But a practical MHD generating system has many difficulties. General Electric's Space Sciences Laboratory at Valley Forge is one of several places working toward the large-scale experiments and pilot plant necessary to prove out the technology.

"Much is being done to expose the potential benefits of MHD to central station power generation," notes Dr. Bert Zauderer, manager of MHD Programs. "A 1975 Government-sponsored Energy Conversion Alternatives Study showed that MHD could be capable of 48% power-plant efficiency compared to conventional

steam plants' 36% average, and turn out electricity at lower costs, with better environmental performance."

Engineers from Zauderer's staff are working on several DOE-funded projects, including plant studies, and combustor and heat exchanger development. In addition, Schenectady's Energy Systems Programs Department is building a superconducting magnet for use in a 50-mw test facility now under construction near Butte, Mont. Concludes Zauderer: "These MHD generation projects are at the frontier of high-temperature technology—and hold the promise of the highest-efficiency coal-based power plants as their ultimate payoff."

GE's practical approach to hydrogen technology

Hydrogen has been aptly described as "the most abundant, most energetic and cleanest of all the elemental fuels in the universe." And for a time in the early 1970s, a new "hydrogen economy" was forecast as a near-term replacement for the present economy based on the consumption of hydrocarbon fuels.

But that optimism proved premature as the realization came that the technology of producing hydrogen at competitive costs had a long way to go.

Faith in hydrogen as the fuel of the future, though, continues to animate researchers at GE's Direct Energy Conversion Programs operation in Wilmington, Mass. There, Project Engineer John H. Russell is leading a four-year-old program, with funding from the DOE and other sponsors as well as GE, to develop a lower-cost hydrogen production process. Called the solid polymer electrolyte technology, it uses a solid sheet of ionically conductive plastic as the sole electrolyte in place of the liquid caustic electrolyte used on conventional systems today.

Russell sees this method of producing hydrogen as "a real breakthrough in improved water electrolysis performance" and foresees solid polymer electrolyte modules becoming commercially available in the 1980s—"whereas the chief competing technology, thermochemical water splitting, is not projected to be available until sometime in the year 2000."

The GE system has already moved beyond being merely a laboratory process. "We expect to have a 200-kw system on test in 1979," Russell says, "and a 500-kw system in 1981. The program will culminate in 1983 with the construction of a 5-mw demonstration plant produc-

ing approximately 1.3 million standard cubic feet of hydrogen per day. The hydrogen produced, using off-peak electric power, will be blended into the Niagara Mohawk Power Corporation's natural gas pipeline to help meet peak energy demands."

Wilmington Applications Engineer Leonard J. Nuttall doesn't foresee hydrogen becoming a universal or even a primary fuel for many years to come. "But it's important to keep the technology advancing and, in the interim, there are

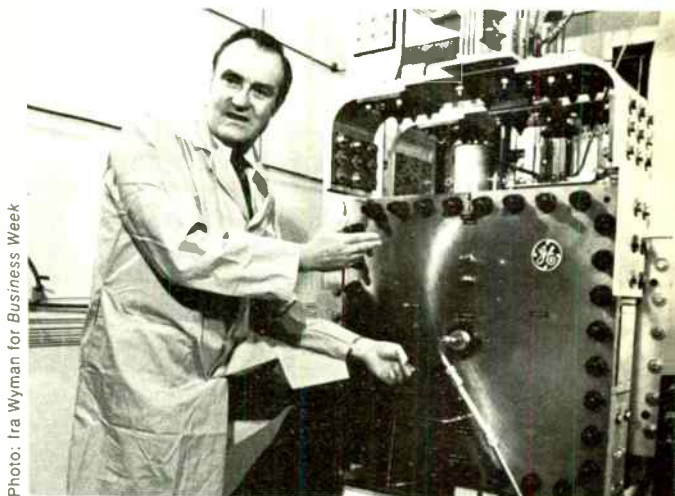


Photo: Ira Wyman for Business Week

To reduce hydrogen production costs, a high-efficiency system is being developed by Wilmington's Direct Energy Conversion Programs researchers. Shown: Applications Engineer Leonard J. Nuttall.

good related opportunities for us. Substantial quantities of hydrogen are already used for various chemical and industrial processes, and we anticipate an increasing number of new uses as the economic and environmental aspects of the energy picture change. This solid polymer electrolyte technology will give hydrogen users the option of generating their own hydrogen on site—in most cases at a lower cost. In addition, large hydropower resources can be efficiently utilized for hydrogen generation, either as an energy carrier or for ammonia production. One benefit would be a reduction in the amount of increasingly scarce natural gas used to produce hydrogen."

These potential markets, plus the changing economics and environmental factors in the overall energy situation, add up, in Nuttall's view, to "a substantial business opportunity for General Electric." ■

Five who accepted a challenge



Championing the cause of the blind, GE do Brasil's *José Onofre de Nascimento* helps newly hired blind workers at GE adjust to their jobs. Himself blind, he is a volunteer public relations representative for the Helen Keller Institute, and has raised funds to convert an old building into a school for blind girls. Onofre also has made radio and TV appearances to raise funds and promote jobs for the blind.

For the first time in the ten-year history of the Gerald L. Phillippe Awards for Distinguished Public Service, an international winner is among the persons chosen to receive the Phillippe medal. The individual: José Onofre de Nascimento, a manufacturing helper in GE do Brasil's Meter Operation. The Phillippe Awards—named for the late General Electric board chairman, who was a leader in the public-service field—were first given in 1970, and since then a total of 49 individuals and two teams have been selected. With each medal comes an opportunity to designate a charity or educational institution for a \$1000 grant from the General Electric Foundation.

Commenting on the employees nominated for the 1979 medals, awards committee chairman VP Douglas S. Moore, Corporate Public Relations Operation, said: "Reviewing this year's nominations was another thrilling experience for the Awards Committee. We can all be proud of the remarkable voluntary public service rendered by the nominees which contributes to the welfare of people worldwide." ▲



Assisting poor people of developing lands to help themselves, Gas Turbine Division's *Daniel Johnson* (above left), manager of Schenectady's Electrical Controls Development Laboratory, has provided technical aid to underdeveloped nations for two decades through Volunteers in Technical Assistance (VITA). His *Village Technology Handbook*, which he reviews here with co-worker Robert Macier, was written for VITA's use in underdeveloped nations around the world.

Providing leadership in urban renewal, education and Red Cross disaster relief, Aircraft Engine Business Group's *Gerald S. Burns* (below right), manager—Market Planning and Analysis, helped reverse deterioration of Cincinnati's East Walnut Hills by restoring unsaleable, turn-of-the-century houses. He also raised funds to improve facilities at a competitive-entrance public high school with school principal David Shepherd (l), and has led Red Cross relief efforts.



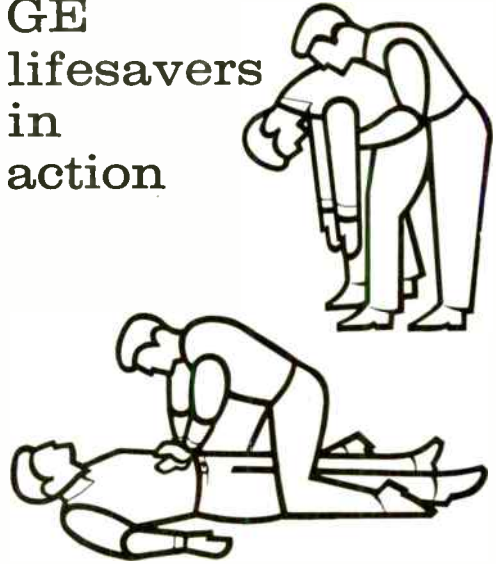


Aiding law enforcement officials, *Mary Monnet*, a Semiconductor Products Department employee relations and communications specialist in Auburn, N.Y., established an educational program for inmates at nearby Cayuga County Jail. Since the program's inception, 75% of the inmates tested have received their high school diplomas, and others are working toward college degrees. Monnet also works at a rape crisis center, and is shown above counseling a rape victim.



Leading renovation efforts for a low-income area of Largo, Fla., physicist *Tasker Beal, Jr.* (r). Neutron Devices Department, chaired a citizens' advisory committee that allocated two \$1 million community development grants which were used to implement neighborhood improvements. As president of the neighborhood's volunteer fire department, he helped arrange for the city to build a new firehouse and hire full-time firefighters. Also, Beal is a member of the board of directors of a day care nursery and kindergarten, shown above.

GE lifesavers in action



About 700,000 fatal heart attacks and 3000 reported incidents of "café coronaries," or choking to death on food, occur annually. To help reduce these tragic numbers, many General Electric locations have been offering instruction in emergency lifesaving techniques. Is there a return on the time invested to learn the procedures? These three employees think so:

- **Bernice F. Benson**, with Utica's Aerospace Electronic Systems Department: "It happened last fall at Cape Cod. A man was choking in a restaurant—he was panic-stricken and unable to speak. Because I knew the Heimlich Maneuver, I knew that applying upward pressure to his diaphragm would expel the trapped food. It saved his life."
- **Eugene J. Timmons**, Bridgeport Relations & Facilities Operation: "I was on vacation. One morning, about four o'clock, a frightened girl from the cabin next door pounded on my door, pleading for help. Her grandfather was having a heart attack. I administered CPR [cardiopulmonary resuscitation], and he regained consciousness by the time the ambulance arrived."
- **Ronald R. Davis** of Columbia, Md.'s Product Distribution Operation: "A friend with a history of heart trouble lost control of his snowmobile, hit a tree and went flying over the handlebars. When his ski mask was removed, I saw that he had stopped breathing. I lifted his head, breathed three times into his mouth and pumped his chest. Finally, he came around. I think he would have died if I hadn't known what to do."

Monographs



East meets West. Relations between the U.S. and the People's Republic of China (PRC) have come a long way in a short time. Recently, a delegation of 19 PRC mining engineers, professors and political leaders completed a six-week tour of U.S. coal industry facilities. Among the tour stops: Navajo mine near Farmington, N.M., operated by GE's natural resources affiliate, Utah International Inc.

Ranked third in the world in known coal reserves, PRC plans to open a number of surface mines in the near future and, accordingly, PRC representatives requested technical help from Utah to develop one of their new operations.

During the U.S. visit, Utah officials were shown geologic maps of China's Northern Shansi Province and a picture of a coal field with estimated reserves of about 12 billion tons of coal—almost 12 times Utah's reserves at Navajo. Utah has submitted a preliminary plan for a PRC mine which could produce 10 million tons yearly.

At mine headquarters, the group (above) was treated to a traditional Navajo lunch of mutton stew and fry bread served by women from the Navajo Indian Reservation.

Photographing Jupiter. Clouds churn around Jupiter's Great Red Spot (below) in a recent Voyager I photo taken from a "mere" 5.7 million miles away. Powering the NASA spacecraft's scientific experiments, including the on-board cameras, are three General Electric Multi-Hundred Watt Radioisotope Thermoelectric Generators. Identical GE generators are aboard Voyager II, scheduled to rendezvous with the Jovian system this July.

Voyagers I and II left Kennedy Space Center in 1977



UPI photo

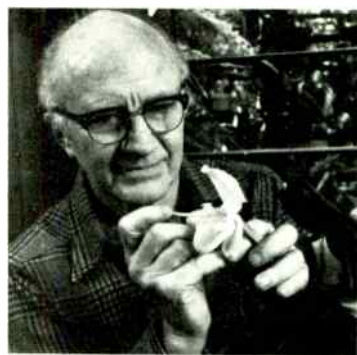
on a possible 12-year odyssey through the solar system and into interstellar space. Incidentally, when not studying the Jupiter photos, astronomers are still busy compiling a more precise profile of Venus, which has emerged from pictures and data returned by NASA's two Pioneer spacecraft in December. One craft ejected four GE deceleration module probes to collect information on the Venusian atmosphere.

Lyco mormium Fiskei. In 1971, along Ecuador's Pastasza River, Schenectady's Dr. Milan D. Fiske made a discovery

which now bears his name. *Lyco mormium Fiskei*, an orchid with pendant-spiked white and pink blossoms, is now on orchid fanciers' lists as one of the world's 30,000 orchid species.

"I got interested in orchids in 1960, and now have a greenhouse with 300-400 varieties," notes the R&D Center physicist. "It's easy to find an orchid species that will grow in your environment. Orchids thrive in the Arctic Circle as well as at the southern tip of South America."

An avid orchid collector, Dr. Fiske has made 12 trips abroad in search of new species, traveling to Central and South America—particularly Ecuador—and Southeast Asia. He now serves as chairman of the research committee for the American Orchid Society, and has donated several of his newly discovered varieties to the New



York Botanical Garden and the National Botanical Garden in Washington, D.C.

Orchid collecting began in the 19th century in England, he notes. "Because most orchids come from the tropics, only the wealthy could afford them, and a competition started. Some flowers were auctioned off for \$20,000 apiece!"



'GE Winter Olympics.' On Vermont's Pico Peak, it was the 19th annual running of the all-GE downhill ski competition, and ski teams from nine Company locations were on hand March 3 near Rutland to compete in this increasingly popular interdepartmental contest.

When the tournament was over, Pittsfield's teams had posted a cumulative four-second edge over Burlington, Vt., and thereby took first place. Fastest of the men skiers was Pittsfield's Robert Rusk, who posted an elapsed time of 35.79 seconds, good enough to garner the top trophy. The women's top winner was Burlington, Vt.'s Kim Hall, who sped through the gates in 38.60 seconds.

All told, 172 GE employees and their spouses participated, and gold, silver or bronze medals went to 35 men and 25 women in team and individual competition. Both the men's and women's courses were set in a giant slalom configuration at a level of difficulty allowing novices to negotiate the turns—yet providing a challenge for veteran skiers in their race against the clock. The average time through the downhill course was about 45 seconds.

Shown above: first contestant down the slope, Schenectady's Diane Olson.

'Entering an exciting time.' In addition to an overall annual Corporate meeting with financial analysts, each year a major segment of GE's operating businesses conducts an in-depth review. On March 8 it was the turn of the Industrial Products and Components Sector. For the more than 100 analysts assembled at New York's Waldorf-Astoria, Senior VP and Sector Executive Stanley C. Gault and his associates pre-



sented a positive, confident account.

"Our objective for the future is to continue to grow net income faster than the GNP by a significant amount," Gault said. "Based on the record and the plans we have in place, we believe this is both reasonable and obtainable."

During the past five years, he reported, the Sector's income growth rate exceeded the GNP growth rate by about 50%. "Given the economic peaks and valleys of the last five years, we believe this was quite an accomplishment."

Gault left no doubt that he sees these past results as only a beginning. He summed up by picturing the Sector's businesses as "entering one of the most exciting and profitable times in their history."

Flak Bait. By the time World War II ended, a certain Martin B-26 Marauder bomber, nicknamed "Flak Bait," had flown 202 missions and was ready for her 203rd. No other Allied bomber ever topped her number of missions. During her 21-month career, she logged 725 hours of combat and picked up more than 1000 flak holes. Twice the plane returned to base on one engine—once with an engine on fire. Her hydraulic system was shot out once and her electrical system was knocked out twice. Every control surface was replaced at least one time.

The pilot for most of *Flak Bait's* career was a young lieutenant, James J. Farrell—now a senior pilot for General Electric in Fairfield who flies Corporate aircraft worldwide. Here, Farrell is pictured examining *Flak Bait's* forward fuselage, which is honored by being on display at the National Air and Space Museum in Washington, D.C.

Farrell recalls: "*Flak Bait* was a flak magnet. Other planes



in the formation could pass unscathed, but our olive drab Marauder seemingly never left the ground without being peppered. Her greatest claim to fame is that she was a survivor. Some 5000 others of her sisters went down during the war, but she came through in one piece."



Strengthening Africa's

A *Monogram* visit to Central Africa finds GE products and services improving the region's infrastructures.

Africa. Mention of the name in newsmagazines or on the network nightly news often precedes reports of territorial disputes or social upheaval. But hard work and sacrifice in many parts of Africa are producing exciting and constructive achievements as well—so much so that General Electric's Africa, Middle East Area Division has opened regional business offices in Nigeria and Egypt.

What role is General Electric playing in the expansion of African nations' infrastructures? That was a question continually posed during a *Monogram* reporter's recent visits to three progressive Central African countries—Nigeria, Kenya and Ghana.

A pre-trip overview was provided in London by VP Paolo Fresco, general manager—Africa, Middle East Area Division, and in Westport, Conn., by VP Edward F. Roache, general manager of International Construction Business Division.

Central Africa is huge, with a seemingly infinite number of opportunities, but with pressing problems as well, Fresco observed. It has 30 countries and 200 million people, but a literacy rate of less than 12%. The area's Gross Domestic Product is growing at a rate about 50% faster than the U.S., but shortages of skilled workers and managers act as constraints

to development.

Continued Fresco: "Central Africa enjoys tremendous mineral resources, but its nations are experiencing difficulty in absorbing technology as fast as they would like. Among hurdles facing companies operating in this region are the high costs of doing business and poor communications. GE's approach has been to develop long-term plans and dedicate appropriate resources on a selective basis, both from a product and country viewpoint. We seek to maintain the flexibility needed to capture the most attractive opportunities, while staying responsive to change."

He adds: "Central Africa has come a long way in the 20 years since the nations here started down the road to independence. Since 1973, GE has increased its annual sales *more than six times* in this area, and we foresee impressive new growth in the years ahead. Our challenge is to supplement our exports with a more permanent presence in the region's most attractive countries—to lay the groundwork for longer-term participation, following the pattern similar to that successfully implemented in such regions as South America."

A more specialized view of opportunities in Africa is taken by VP Roache, whose Division includes GE's International

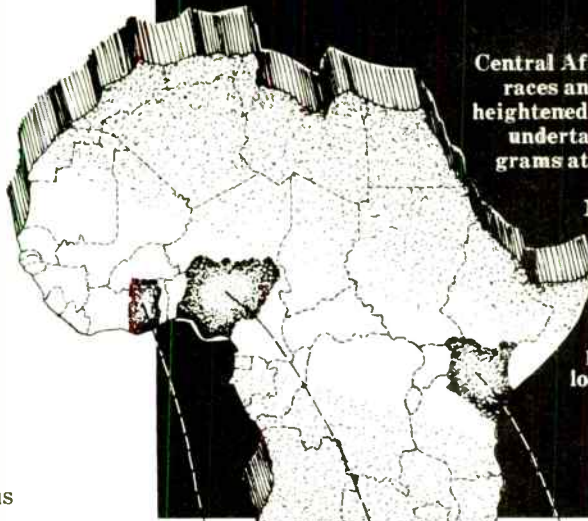
Projects Department (IPD) and the Sade/Sadelmi Construction Operations, headquartered in Milan, that came to GE some years ago as part of the acquisition of Cogener, a GE Italian affiliate. "These components have the expertise to take on management and implementation of major infrastructure projects," he says.

"GE's strength in Central Africa involves its high technology, wide range of products and services and 'can do' attitude, which provide a 'good fit' for serving developing infrastructures," Roache concludes.

Nigeria's economy is booming, making it one of the United States' most important trading partners and GE's largest market in Central Africa. Presently Africa's most populous nation—with 75 million inhabitants who constitute one-sixth of the continent's population—oil-rich Nigeria is the No. 2 source of U.S. oil imports after Saudi Arabia. With civilian rule scheduled for October, Nigeria soon will become Africa's largest democracy.

"Stimulated by major oil exports, Nigeria's economy has created an urgent need for infrastructure development—electric power, railways, ports and communications," notes John D. Maddox, GE's Country Sales Manager. "Implementa-

Central Africa—homeland of diverse races and languages—is taking on heightened business significance as it undertakes new development programs at a feverish pace. GE activities in such countries as Nigeria, Kenya and Ghana include installation and construction projects—as well as supply of products ranging from lighting systems and appliances to power systems, locomotives and jet engines.



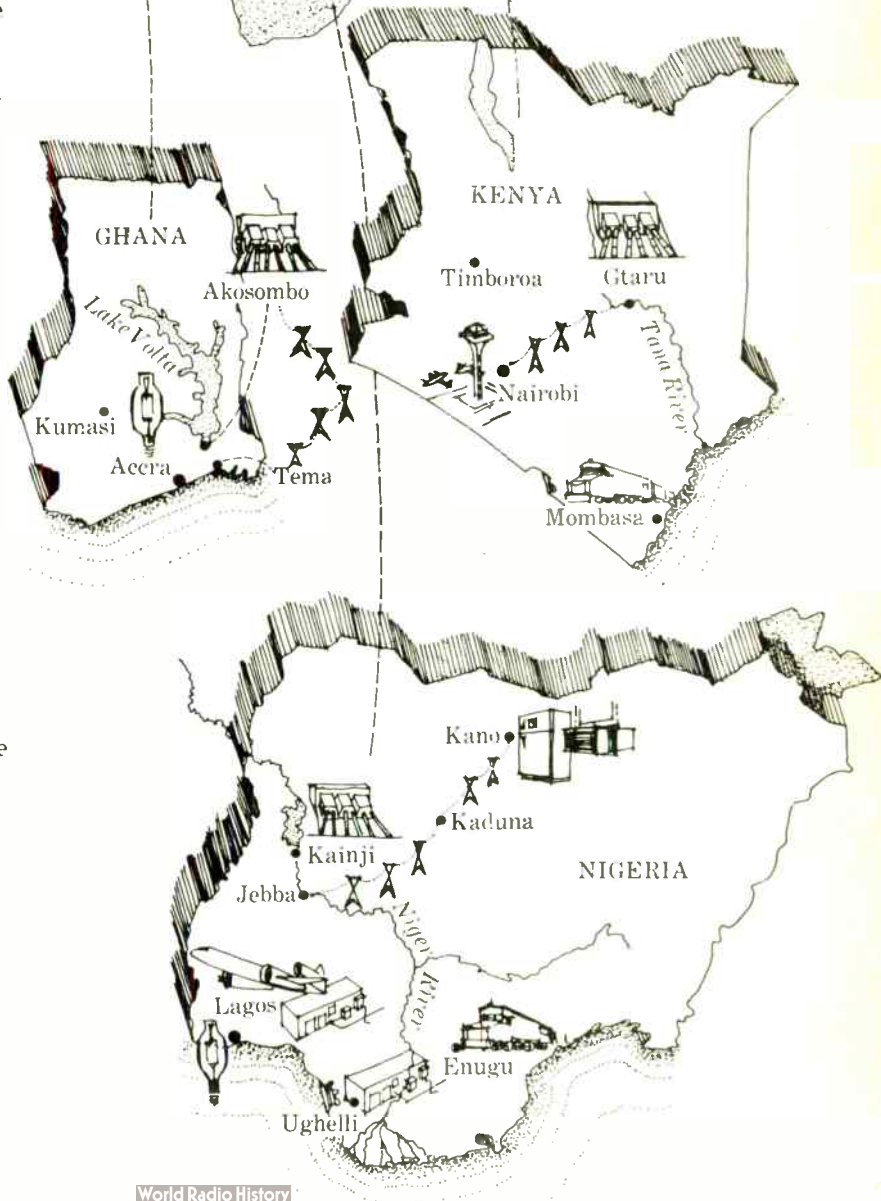
tion of Nigeria's ambitious plans has created vigorous growth—but also inflation, shortages and bottlenecks. The opportunities are enormous for the types of product and service contributions GE can make."

At Ughelli in the delta region, Nigeria's National Electric Power Authority (NEPA) has tackled the nation's need for more electric power by having General Electric install 12 frame-5 gas turbines at its 240-megawatt Delta station. GE performed the work on a turnkey basis, assuming total responsibility for all aspects of design, civil engineering, construction and equipment installation. IPD and Sadelmi worked together on the project.

Notes Maddox: "In 1978, NEPA was faced with a serious problem when dry weather caused the level of the Niger River to drop, affecting important hydroelectric plants. To help meet expected shortages, NEPA again turned to GE. Three frame-5 gas turbines were ordered for the Ijora power station in Lagos, and the same International Construction Division components delivered and installed them on a turnkey basis in record time—only eight months!"

Helping ease congestion at the port of Lagos has been a chief objective of the Nigerian gov-

(continued next page)



ernment. At one point, in July 1975, more than 300 vessels were awaiting unloading outside the harbor. Within one 12-month period, the Nigerian Railway Corporation ordered 51 GE diesel-electric locomotives—six 2200-hp freight locomotives to ease transport problems, and 45 1800-hp units for freight and passenger service.

Progress in air travel by Nigerian Airways also has been achieved, by the selection of DC-10 wide-body aircraft and GE CF6 high-bypass turbofan jet engines. International flights connecting Lagos with New York and various European cities are now available and, in April, commercial service will begin out of Lagos' new international airport.

"Major street-lighting programs by Nigeria's Federal Ministry of Works represent another area of GE participation," observes Charles A. Nelson, manager—Apparatus & Components Sales. Nelson, a Nigerian citizen with six years of GE experience in the U.S., points out that "auto accidents, pedestrian deaths and street crime have been cut dramatically with proper street illumination. All the modern residential street lighting on Victoria and Ikoyi islands in Lagos is provided by Lucalox® high-pressure sodium (HPS) lamps with Powr-Door® luminaires."

GE lamps and luminaires also can be seen along the expressway and roads leading into Lagos. Nelson credits New African Development Company, Ltd., GE's distributor and sales representative for power systems products, for promoting the lighting program.

GE major appliance distributors in Nigeria include Compagnie Francais L'Afrique Occidentale—which sells GE refrigerators, room air condi-

(continued on page 18)



When "brownouts" threatened Lagos last year, emergency electric power was provided by three GE frame-5 gas turbines at Ijora station.

Nigeria



Liberian-born Steve Boayue (above), GE locomotive engineer working with Nigerian Railways in Enugu, helps maintain 51 GE diesel-electric units delivered over past several years.

In Kano, GE air conditioners and refrigerators are sold by GE distributor Malcolm Madge (r), shown with GE's country sales manager, John Maddox.



Helping build Kenya's railway infrastructure, 26 GE diesel-electric locomotives were recently delivered at Indian Ocean port of Mombasa.

Kenya



At Nairobi's airport, GE construction affiliate, Sadelmi, installed electrical/mechanical systems that operate control tower, runway lights and various air terminal services.

Near Gtaru hydro plant (r) Sadelmi linemen erect transmission tower. Sadelmi supplied the dam's substation and built the towers which bring power to Nairobi.



In Accra, GE's complete line of lighting systems are sold through All Afra Electric, headed by distributor Carlos Allston (l).

Ghana



Now safer for motorists, Accra's Labadi Road Bypass is lit with 400-watt Lucalox® lamps in Powr-Door® fixtures. Ring Road, Accra's main east-west artery, also is equipped with GE lighting.

Built along the lines of Paris' Arc de Triomphe, Accra's Arch of Independence is enhanced at night by Lucalox® lamps in Powerflood® fixtures.



tioners and central air conditioning systems—and Vivian, Young & Bond, which sells Hotpoint® appliances, GE motors and other equipment. Ibru Communications Ltd., based in Lagos' Apapa district, recently became a full-line distributor of GE mobile radios.

Nigerian construction projects have been conducted by Sadelmi since 1966, when it began erecting the substation at the Niger Dams Authority's Kainji hydroelectric plant. Other Kainji work included installation of lockgates for river navigation. In 1975-77, the plant was extended, and Sadelmi supplied and erected the powerhouse switchyards and electrical auxiliaries.

Now nearing completion in northwest Nigeria is the 540 kilometer Jebba-Kaduna-Kano transmission line, which will bring electricity generated by Niger River dams to the northern cities of Kaduna and Kano Sadelmi designed, supplied and is erecting this 330-kilovolt transmission line

At Sapele in the southern delta, Sadelmi is the lead electrical contractor for NEPA's 720-megawatt Ogorode thermal station, and is providing engineering, supplies and erection of medium voltage switchgear, boards, controls and other systems. Already installed in the plant are 23 sets of General

Electric 415-volt motor control centers and power centers.

"We are enthusiastic about Nigeria's economic progress, and proud that it has asked us to play a role," states Sadelmi General Manager Giorgio Orsi. "Few countries can match the economic strides of this busy nation. It's a country on the move—busy and optimistic."

Kenya's national motto, "Harambee," is Swahili for "let us pull together." Led by founding father Jomo Kenyatta from 1963 until his death last year, Kenya is among the most economically advanced of the East African states.

Observes GE's Jack J. Airhart, manager Locomotive Service & Parts Sales: "High among Kenya's needs is a national railroad network, and the government is committed to a major building program."

Last year, to replace 34 of Kenya's old oil fired steam locomotives, GE shipped 26 2450-hp diesel-electric locomotives to Kenya Railways in Mombasa. These units are in both freight and passenger use on the 330-mile Nairobi-Mombasa run—Kenya's principal rail artery.

States Kenya Railways managing director, D. K. Ngini: "General Electric was selected for this order because it met the technical requirements, financial arrangements and

price. Special locomotives were needed—ones that could handle atmospheric conditions near the Indian Ocean as well as at Kenya's 9000-ft.-high Timboroa station. They had to be light, able to pull heavy loads on narrow meter-width tracks, and hold large amounts of fuel."

Nairobi International Airport represents another transportation activity for GE in Kenya. In 1973, Sadelmi began installation and erection of the lighting and other electrical and mechanical systems for this modern aerodrome. The work, for the Ministry of Public Works, was completed last year.

In 1976-78, for the Tana River Development Project at the Gtaru hydroelectric plant in central Kenya, Sadelmi provided supplies, civil work and erection of the dam's substation, as well as plant auxiliary services. Gtaru generated its first electric power five weeks early.

During this same period, Sadelmi designed, supplied and erected a 121-kilometer transmission system—of primarily 275-kilovolt lines—bringing Gtaru's power southwest to Nairobi. Sadelmi construction teams built the 30-meter-tall towers at a rate of two per day, completing this work 10 months ahead of schedule.

Situated next to GE offices on Wabera Street in downtown Nairobi is Ngao Enter-

In Nigeria's delta region, Sadelmi project manager Raffaello Zeghini (l) visits with GE's John Maddox at Ogorode thermal station under construction. Below: Nigerian Airways DC-10 with GE jet engines.



prises Company (Kenya) Ltd., GE's distributor and sales representative for power distribution products. The company recently received an order from Kenya's East African Power & Lighting for four GE 7500-kilovolt-ampere transformers, to be supplied by GE-Española.

Comments Joseph B. Wanjui of Ngao, who also is chairman of the Kenya Association of Manufacturers: "Though modest in the past, General Electric's presence in Kenya is definitely growing. Its fine reputation in Africa with locomotives and power generation products hopefully will be parlayed into many other GE business activities."

A recent indicator of that? At the Kenya Air Force's Eastleigh Station in Nairobi, GE technical representative Andrew P. Johnson is providing intermediate maintenance and technical services on GE J85 turbojet and CT64 turbo-shaft engines, which power Kenya's Northrop F-5 fighter-trainer and deHavilland DHC-5 Buffalo aircraft.

Ghana's capital, Accra, has one of the sunniest sea fronts of any African state, and at night continues to glow as one of Africa's brightest-lit cities. For good reason. During the past three years, General Electric's lighting distributor, All Afra Electric Ltd., has used Lucalox[®]

lamps exclusively in supplying all of the city's modern street lighting. Ghana's Arch of Independence in Accra is also lit by GE lamps and fixtures.

As the first European colony below the Sahara to achieve independence—on March 6, 1957—Ghana gave impetus to the nationalist movement that later swept Africa. The country made important strides during its first years of sovereignty, but huge foreign debts and other problems subsequently slowed this advance. Now, economic progress has begun and, as in Nigeria, free elections have been pledged in October.

"Ghanaian improvements are definitely underway," states All Afra Electric's managing director, Carlos S. Allston, an American by birth who moved to Ghana in 1959 and took Ghanaian citizenship. "The country has commissioned its first commercially viable offshore oil field, and a new hydroelectric plant is now being started."


One dividend of improved street lighting that is often overlooked is civic pride. So pleased has been the Accra city council with the 3000 GE 400-watt Lucalox lamps installed along 75-80 miles of Accra's avenues that the council now has ordered more than 1500 more, for another 20 miles of Accra streets. Based on the lighting success in Accra, Ghanaian cities such as Kumasi

also are using Lucalox lamps for all of their modern lighting.

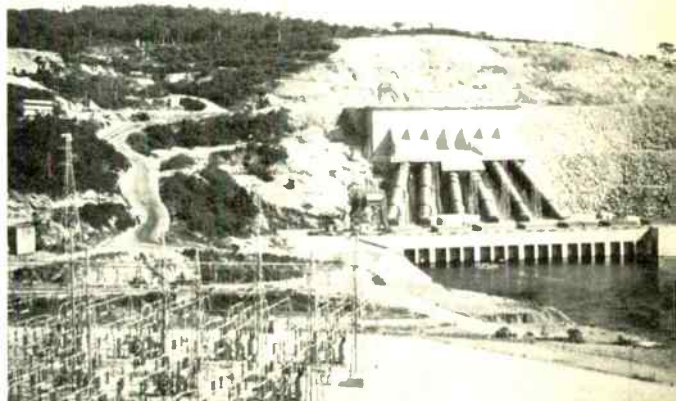
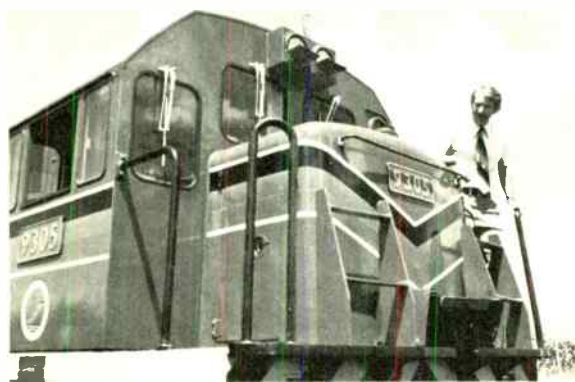
Akosombo hydroelectric plant northeast of Accra on Ghana's Volta River, and its related aluminum-smelting facilities at Tema, represent the largest industrial projects yet undertaken by this nation. Canadian General Electric supplied six hydraulic generators and electrical transformers to the Volta River Authority, and Sadelmi installed and erected them, as well as the turbines.

CGE and Sadelmi began their long association with Ghana in 1963 when Sadelmi, simultaneously with the installations at the Akosombo plant, provided materials, supplies, the civil work and erection of 18 substations that furnish power throughout the country's southern region.

From 1975-76, Sadelmi supplied and erected the 161-kilovolt transmission line that brings Volta River power to the Tema smelter, and the firm has built two other substations.

"We've been fortunate in Ghana in obtaining excellent manpower," notes Sadelmi's Orsi. "Ghanaians hired and trained on the Volta River projects have since worked in Europe, the Middle East and other parts of Africa for Sadelmi as senior engineers, steel erectors, pipefitters, welders and linesmen." 

In Kenya, GE's Jack Airhart inspects "giraffe catcher" apparatus required on Kenya Railways locomotives. Right: Ghana's Akosombo hydro plant includes six CGE generators and transformers installed by Sadelmi.



For anyone whose impressions of the seafaring life were formed by reading Herman Melville and Joseph Conrad, a close-up look at the shipping operation of Utah International Inc., the Company's natural resources affiliate, is eye-opening.

A reporter finds Utah shipping to be a special world, with its own special language. Right away, one has to become familiar with OBO ships—that's short for ore/bulk/oil vessels. Utah's fleet of 12 ships includes several of the world's largest OBO carriers. "Backhauling," "fixing" a ship and "weather routing" are other terms that dot the conversation of the traffic planners, ship operations people and maintenance staff-members visited recently during a *Monogram* tour of Utah's three areas of shipping responsibility—Utah Transport Inc., Utah Shippers Inc. and Marcona Carriers, Ltd.

Why does Utah operate its own fleet? "Oceanic transportation constitutes a major cost item in the international marketing of minerals," observes Donn K. Furgerson, VP and general manager of Utah Transport Inc. "To get the best price for our minerals, it's important to establish a strong marketing position through stabilized freight rates. In order to guarantee a reliable delivery schedule at a reasonable price, we ship a good portion of our minerals on Utah-controlled vessels—ones either owned or on long-term charter. The alternative is to be at the mercy of a near-term 'spot' market, which can take some rather violent swings in a short period of time."

He continues: "Utah's shipping strategy is straightforward: maintain long-term shipping capability at the most

NATURAL RESOURCES

Utah's navy

Australian coal for Europe?
Brazilian iron ore for the U.S.?
GE's natural resources affiliate has the ships to deliver.

economical rate. This requires a careful choice of the best vessel to make a particular delivery. On return trips to all our loading ports, we seek 'backhaul' cargoes to offset costs. Also, we try to provide maximum scheduling flexibility."

"Fixing" a ship is shipping lingo for obtaining a charter contract. Utah tries to get the best combination of vessel size, fuel consumption and rate of speed for a cargo delivery. "Before a vessel is picked," states George A. Coppo, manager—Traffic and Planning, "Utah planners work up a voyage-cost estimate. We factor in the number of days at sea and in port, port charges, fuel to be consumed and price, cargo-hold cleaning, extra insurance and canal fees. Certain harbors require extra pilots. Some ports have unloading delays."

He continues: "When chartering, we determine the cost-per-ton to move the product and consider market conditions. Sometimes, 'slow-steaming' at 10 knots is more cost-effective than cruising at a full speed of 15 knots."

Coppo adds: "Bad weather is always the 'wild card' in shipping strategy. Thirty-foot-high seas can appear in the Indian Ocean and the North Pacific and Atlantic. To stay on schedule, we 'weather route' our ships by constantly supplying them with meteorological data obtained from satellites and other ships in their area."

Utah's shipping people try to extend each voyage's profitability by obtaining backhauls. Ships carrying Utah coking coal from Australia to Europe often stop in Brazil on the way back and carry iron ore to Japan. Another example: a ship homeward bound from Europe to the Pacific may stop in the Persian Gulf to load a cargo of oil for delivery to Taiwan.

Notes Tony Cogliandro, traffic supervisor for the Mineral Products Marketing Department: "Each shipment requires close teamwork between Utah's shipping and mineral marketing people. My job is to serve as a coordinator between Utah's marine department and our customers. I try to find the best path between our customers' needs and our ships' availability."

The largest coal cargo ever carried out of the U.S. in one vessel was shipped last May from Newport News, Va. Under a backhaul charter to another firm, Utah's OBO carrier, *Lake Tahoe*, loaded 123,210 short tons of steam coal—the contents of 1446 coal rail cars—and carried it to Japan.

In January 1978, a new



Utah's *Lake Shasta* takes on iron ore at Point Ubu, Brazil, obtained from the Samarco mine in which Utah holds a 49% interest. Earlier, the ship had carried Utah coking coal to Europe.

world record for a single cargo of coking coal was set by Utah's *Lake Arrowhead*, when it sailed from Hay Point, Australia, via the Cape of Good Hope to Taranto, Italy, carrying 151,271 metric tons of Utah coal.

"This 14,000-mile passage to Taranto takes 53 days and is among the world's longest," observes Russell W. Gorman, superintendent—Operations Planning. "We do everything we can to accommodate our personnel on these long trips—from equipping many of our ships with automated controls; to providing movies and recreation rooms to enliven off-duty hours; to rotating crew members off at ports nearest their homes."

Ship officers hired by Utah sign five-month contracts, and unlicensed crew, six-month contracts, says Gorman. "We try never to rotate the master [captain] at the same time as

(continued next page)



Before carrying a grain cargo to Amsterdam, Utah's *Lake Almanor* (above) drops anchor in Mississippi River. Below: Utah Transport's VP and general manager, Donn Furgerson (l), with Charlie Canellakis, superintendent—Traffic and Chartering.



the chief mate, or the first engineer with the chief engineer. We want job continuity for safety and efficiency.”

Utah-managed ships can be found in any ocean during any given month. The only vessels “confined” to one region of the world are the *Marcona Conveyor*, dedicated to carrying Marcona aragonite from the Bahamas to U.S. ports—and the *Marcona Transporter*, which delivers Marcona iron sands from New Zealand to Japan.

Last year, an eight-month-long odyssey saw the *Lake Tahoe* take a load of coal from Hampton Roads, Va., to Japan; pick up oil in Saudi Arabia and carry it to Indonesia; then transport tapioca from Thailand to Europe.

To be sure, ships are not infallible. They break down—sometimes on the high seas. Repairs must be made quickly. “Last fall, en route to Japan with iron ore from Brazil, the *Lake Arrowhead* lost two of its three generators,” recalls William R. Odom, manager—Engineering, Construction and Maintenance. “We sent the vessel to nearby Singapore, used a 747 aircraft to fly in a generator and diesel engine from Los Angeles, and lost only one day of time!”

He adds: “A portion of Utah’s maintenance staff is on call 24 hours a day to handle emergency repairs, purchase parts, and obtain drydock and overhaul services.”

Concludes Keith G. Wallace, senior VP and manager—Australasia Division: “Utah’s shipping strategy—of establishing a balance between owned and chartered vessels—is working exceptionally well. Both the company and its customers should continue to benefit from Utah’s operations planning and performance.”

PEOPLE

A gallery of GE authors

After-hours and after retirement, GE people are in print on topics ranging from Rocky Marciano to Wall Street.

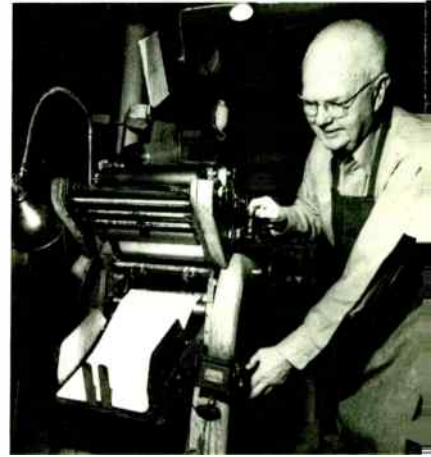


Henry Champagne: 2500 poems to his credit

Henry J. Champagne was 76 years old before he wrote his first poem. Today, at age 88, he’s penned nearly 2500 of them!

“I was chairman of a special interests group in the Golden Agers Club,” recalls the 1956 retiree from Pittsfield’s former Power Transformer Department. “One of our speaker’s topics was poetry, and we were all asked to write a short poem. People seemed to think mine was pretty good. I’ve been writing ever since.”

Champagne has published many of his works in two volumes, *Sparkling Diversity* and *Bountiful Overflow*. “My poetry focuses on many subjects,” he notes, “from a surprise nighttime visit by a stray, hungry cat—to meeting old friends at a GE ‘open house’ celebration.” Ideas for his poems, he says, are the result of “being interested in just about everything.”



Retiree Art Merrill—his own publisher

Would you like to know how to add with an abacus? How to make the opening moves in a chess game that likely would lead to checkmating your opponent? How to locate the circumpolar constellations?

Then meet GE pensioner Arthur A. Merrill of Chappaqua, N.Y., a mental gymnast whose publications on these and other twisting matters are produced on his own offset printing press. He produces his works by using an electric typewriter. Sheets are photographed, and pages are stapled together and enclosed in an attractive cover.

Since retiring in 1960 after 33 years with GE, this former Corporate Employee Relations statistics manager also has had published two hard-cover books, *Filtered Waves* and *Behavior of Prices on Wall Street*—the latter a 3000-copy “sell-out.”



Bob Cutter: from boxing to nuclear submarines

On Sept. 23, 1952—when boxer Rocky Marciano kayoed “Jersey Joe” Walcott in the 13th round in Philadelphia to win the Heavy-weight Championship—Robert A. Cutter began a concentrated, 10-day writing stint and published the first biography ever on this undefeated fighter. “My first job after college was with two boxing magazines. I’d closely followed Marciano’s career, had interviewed him 10-12 times and had lots of news clips on his bouts. That book was comparatively easy.”

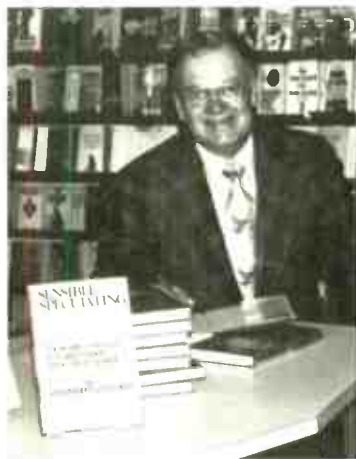
Authorship for Fairfield’s Cutter, a Corporate speechwriter, began early. At age 17, he published a collection of Sherlock Holmes literary lore. In college, he edited a book of political and philosophical essays. For General Dynamics, he wrote a book chronicling the Navy’s first 10 years of nuclear-submarine experience. “In 1965, with a co-author, I began compiling biographies of some 600 top auto-racing drivers. Our *Encyclopedia of Auto Racing Greats* was published in 1973. I’ve also freelanced books entitled *The New Guide to Motorcycling* and *The Model Cars Handbook*—the latter to be published April 15.”



Lew Miller: ‘imagination can lead to success’

By rights, the battle wounds that Louisville’s Louis A. Miller received during World War II should have killed him. Instead, they left this 192-pound young man a 90-pound form in a hospital bed, where he spent two years convalescing. His book describing his recovery, *Your Divine Connection*, reveals the secret Miller is convinced made his dramatic comeback possible—“prayer through mental imagery.”

“Imagination is the most God-like faculty we possess,” maintains this Major Appliance product promotion supervisor (left), shown with Father George Kilcourse of Louisville’s Bellarmine College. “As a ‘divine connection,’ imagination often makes things possible to the degree you visualize them and believe in them.” Miller’s book has been condensed in an inspirational monthly, *Guideposts*.



Sherwood Gaylord: ‘investors should know their options’

“I couldn’t help noticing how many people foolishly put their money into stocks without understanding the options available,” observes Bridgeport’s Sherwood B. Gaylord, shown autographing his investment guide book at a book store in Stamford, Conn. Published by Simon and Schuster, *Sensible Speculating with Put and Call Options* has generated intense interest among novice stock-market dabblers as well as veteran Wall Street practitioners. It was a book-of-the-month selection of Investors Book Club, and led to Gaylord’s recognition in the 1977-78 edition of *Who’s Who in Business and Finance*.

“Too many investors let their brokers take care of ‘options’ transactions, and fail to understand the buy-and-sell system,” notes the GE Distribution Support Operations analyst.



John Papp—‘one man’s junk is another’s book’

Schenectady’s John P. Papp recalls the time he and two other GE employees spent their lunch break searching through the littered landscape of the Scotia, N.Y., town dump for old photo negatives. Why? “Those negatives were of photos taken of Schenectady in the early 1900s,” states the R&D Center photographer-technician. “From an historical perspective, they were extremely valuable for my publications—if we could have found them all. But the bulldozers got to them before we did!”

Papp is a photographer by trade but a history buff by desire and avocation. He’s the author of 20 mini-books that deal with such historical tidbits as trolleys, quack medicine, railroads, the Erie Canal and the 1939 World’s Fair. The books range from 16 to 66 pages long and are promoted through mail-order catalogues.

More than a million insurance claims were submitted to GE last year. Here



Heather Townsend: guarded against 'crib death'

In the maternity nursery of a Pittsfield hospital, a sleeping infant suddenly stopped breathing. Alert nurses saw the emergency—and saved Heather Townsend from becoming a victim of what many today call “crib death.”

Heather has apnea, a condition which is caused by slow development of the part of the brain that controls breathing. Shown above at age 10 weeks with mom and dad, Lynn E. and John A. Townsend, Heather is protected at home by a respiratory monitor. If she “forgets” to breathe, electrodes strapped to her waist trigger an alarm.

“We have about two minutes to revive Heather by using CPR [cardiopulmonary resuscitation] and other rescue techniques,” explains John Townsend, manager—financial analysis and general accounting for Pittsfield’s Ordnance Systems Department. “She’ll be hooked up to the monitor until she’s at least six months old—around the beginning of June, when she should begin to outgrow the problem. Meanwhile, the fire department is on permanent standby, and our house is on the power company’s ‘critical service’ list.”

GE insurance covered 85% of the \$1800 for the special monitor, and almost all of the \$5000 tab for Heather’s delivery, subsequent tests, and Lynn’s care. Concludes John Townsend: “We’ve got enough to think about right now. Knowing that the bills will be taken care of is a big help.”

Meeting medical expenses



Barbara Dodge: three years and \$2110 of dental work

This is not a story in which an employee overcomes seemingly insurmountable odds to win a fight-for-life struggle. It is not a poignant saga of how moral fortitude and steadfast love help conquer unimaginable hardships.

It’s a story about a visit to a dentist.

Where, then, is the drama? It rests on the famous “bottom line”—\$2110 in dental bills. These were the fees for periodontal surgery and related dental care which Fairfield, Conn.’s Barbara Dodge has faced over a three-year span.

“The operations to remove the diseased gum tissue and bone in my mouth had to be performed twice, once in 1976 and again last year. That was the biggest part of the total bill, of course,” explains the Corporate Buildings Operation receptionist/secretary, shown at left with her dentist, Dr. Mark Zamat. “Naturally, I wasn’t too crazy about the idea of having oral surgery done at all. But if I had let the condition continue, I would have lost my teeth.

“I’m glad, at least, that GE insurance helped cover most of the cost. If it hadn’t, something like this, which is pretty unpleasant to begin with, would have been twice as hard to bear.”

are the stories behind three of them.



Sean Doherty: tragic accident didn't cripple his spirit

It happened in October 1975, during a Saturday afternoon football game between two high school academies. There were 30 seconds left to play. Fifteen-year-old Sean Doherty made a tackle. He was hurt.

The diagnosis was devastating: spinal cord fracture and complete spastic traumatic quadriplegia. The young athlete was paralyzed from the neck down. With therapy, he would regain the use of his shoulders and upper arms, but that was all.

Cautions his father, Walter J. Doherty (r), Lamp Marketing Department sales representative in Pittsburgh: "Don't feel sorry for Sean—because you won't find him wallowing in self-pity. He'll be 19 in July, and since the accident, his mother and I have never seen him cry—although I'm sure he has, privately. You see, his strength has helped hold his brother, four sisters, mother and me together. He's got a good, healthy attitude about life, and he's passed it along to the rest of us."

Sean will graduate as an honor student this spring, and will attend Duquesne University, where he'll major in mass communication. "He's really an exceptional kid," adds his father.

Since Sean's accident, professional care, intensive physical therapy and several major operations have brought the Doherty family an avalanche of bills totaling nearly \$100,000! "Thanks to GE Insurance, paying them is one of the few things we *don't* worry about," Walt Doherty notes.



Organization Changes

CORPORATE

Arthur M. Bueche, Senior VP—Corporate Technology, appointed Chairman—Corporate Technology Council

CONSUMER PRODUCTS AND SERVICES SECTOR

Warren N. Higgins, President—Puritan Life Insurance Company, GECC

Lawrence A. Bossidy, VP and General Manager—Commercial and Industrial Financing Division, GECC

Raymond F. Pettit, VP and General Manager—Consumer Financing Division, GECC

William R. Webber, General Manager—Range Product Management Department

INDUSTRIAL PRODUCTS AND COMPONENTS SECTOR

A. Melcher Anderson, General Manager—Southeastern Apparatus Service Department

William H. Broach, General Manager—Western Apparatus Service Department

Edward C. Dietz, General Manager—Southwestern Apparatus Service Department

Paul H. Way, General Manager—International Contractor Equipment Department

INTERNATIONAL SECTOR

John B. Parrish, VP—Consumer Products Operation, General Electric do Brasil, S.A.

POWER SYSTEMS SECTOR

W. George Krall, General Manager—Large Steam Turbine-Generator Department (Engineering and Manufacturing)

A



Financial analysts' recognition of General Electric for "excellence in corporate reporting" was accepted by Chairman Jones on February 2. For GE it was the sixth year in a row that this top ranking has been achieved. Shown with the GE Chairman (l to r): S. Scott Nicholls, Jr., Chairman of the Financial Analysts Federation Corporate Information Committee; Paul A. Blaustein, Bankers Trust Co.; Charles T. Kimball, Morgan Guaranty; Stanley L. Rubin, Merrill Lynch, Chairman of the FAF Electrical/Electronics Subcommittee; and Ronald K. Stribley, Provident National Bank.



Unique Japanese honor was bestowed on GE Board Chairman Reginald H. Jones in Tokyo December 19. Masumi Esaki, Minister of the Japanese Ministry of International Trade and Industry, acting on behalf of his majesty the Emperor of Japan, presented the GE Chairman the "first class order of the sacred treasure" in recognition of his distinguished and long-standing contributions to the development of the Japanese economy and promotion of amicable relationships between Japan and the U.S.A. The GE Chairman is the first American to receive the imperial decoration. Framed scroll includes the Emperor's personal signature and the Seal of the State. Medal worn by the chairman has a silver base symbolizing the mirror that was one of the legendary treasures passed on by the first emperor. Medal's rays recall the gable of a Shinto shrine.



Broadcast Pioneers Mike Award was presented February 6 to WGY, GE Broadcasting Company's Schenectady AM station, "for distinguished contributions to the art of broadcasting and in recognition of dedicated adherence to quality, integrity and responsibility in programming and management." James J. Delmonico (l), GEBCO VP and WGY General Manager, receives the award from Norman E. Cash, President of Broadcast Pioneers.

rush of honors

Honors come steadily to General Electric and its people, but over the past few weeks the usual pace has accelerated into a rush. In addition to the examples pictured:

- General Electric was selected as one of the five best-managed companies in the U.S. In its December 1978 issue, *Dun's Review* picked GE as one of the companies that "did the best job of all" in successfully navigating their way "through the churning seas of uncertainty" in 1978. Said the editors: "General Electric Company is performing at least four difficult management tasks at once, and doing each of them exceedingly well. Under the leadership of 61-year-old chairman Reginald H. Jones, chief executive since 1972, the sprawling giant is managing diversity, managing growth, managing change and managing people."
- Robert L. Fegley, Staff Executive—Chief

Executive Officer Communications in Corporate Public Relations Operation, was singled out by *Business Week* magazine as one of "the nation's top 10 corporate PR practitioners." Criteria for the choice included "the respect of professional peers inside and outside their companies, the confidence of their companies' top management, their PR accomplishments, the degree of corporate influence they wield, and the depth of experience they have in dealing with major policy issues."

- General Electric as a patron of the fine arts received recognition recently when GE and its Evendale employees received a Corbett Award, named for Cincinnati art patrons Patricia and J. Ralph Corbett. A key factor: a payroll deduction option, helping make Evendale GE the largest employee group of fine arts contributors in the U.S. ■



As birthplace of the U.S. jet engine, the Company's Lynn River Works has been designated an "historical landmark" by the American Society of Metals. The first jet engine was produced at GE-Lynn in 1942. At ceremonies (l to r): Lynn's area executive, George H. Schofield, VP and general manager—Industrial and Marine Steam Turbine Division; Arthur D. Godding, Society national executive; and Fred O. MacFee, Jr., VP and group executive—Aircraft Engine Business Group.



Outstanding "Affirmative Action" effort by the GE Customer Service and Distribution Operation's western region in El Monte, Calif., has earned recognition from the City of Los Angeles. Accepting the certificate of merit from Ethel Bradley (c), honorary chairperson of the city's Human Relations Commission, are CS&DO's Rochelle A. Ramirez, manager—Service Facilities and Accounting, and Robert T. Moyer, western region manager. A compliance officer nominated GE for the honor.

PRODUCTS

Making News



Countertop freedom

Introduced to the press in March, the new GE Spacemaker® microwave oven can be wall-mounted or hung from cabinets to provide an innovative alternative to countertop microwave cooking. Installed over an electric cooktop or range, it frees up counter space, is easy to use, and has a built-in vent and cooktop light.



Decorative fluorescent

Newest member of the Bright Stik® family of portable fluorescents is Hi-Light, a decorative lighting fixture featuring a wood-grain-finish shade which can be rotated to direct the light. The new 33-watt unit weighs only 23 ounces and takes only minutes to install.



Long-range reception

The new GE Superadio® is being billed as "the finest AM/FM portable radio the Company has ever manufactured." With design objectives for the best in reception, station selectivity and sound quality, it's ideally suited for use where long-range reception is required.



Compact dryer

Only five inches long and weighing 12½ ounces, the GE Compact 1200 Go® Dryer includes a fold-up handle for easy transport inside a briefcase, handbag or glove compartment. The new unit packs 1200 watts of drying power.

Characters © DC Comics, Inc.



Heroic night lights

Superman and Batman, popular heroes of TV, movies and comics, can now be seen on GE energy-saving night lights—as can Raggedy Ann and such Walt



Disney characters as Pinocchio and Snow White. Available late this summer on GE night lights will be helmets of all 28 National Football League teams—designed so fans can pick their favorites.



'Light' lights

Through use of Lexan® plastic, three of GE's new sealed-beam headlamps (left) weigh only as much as a single glass unit. The new lightweight halogen headlamps will cut three pounds from the weight of a four-headlamp vehicle, and will help car manufacturers improve gas mileage.



Tougher sealants

New GE advances in silicone-sealant technology have led to the development of three new products—a paintable window and door caulk for household “do-it-yourselfers,” Silglaze® 2400 construction sealant and an RTV 1575 sealant for industrial gasketing. The Company’s new Octoate cure technology used to produce these sealants will continue to be a source of other GE-patented silicone products.



Sniffing the air

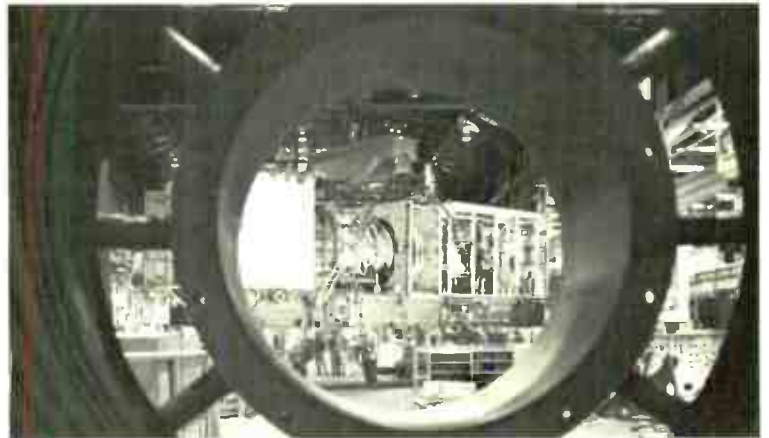
Designed to detect and track minute concentrations of some 70 toxic gases regulated by OSHA, the new GE TVM-1TM Toxic Vapor Monitor is being used by Niagara County (N.Y.) Health Department officials to measure chemical

levels in the air of certain Niagara Falls homes. John Archibald (above), a health aide, checks the basement air of a home near the city’s Love Canal landfill, where residents’ health was recently endangered by chemical wastes.



Portable control

One of the highlights of the recent International Machine Tool Show in Chicago was an articulate “sales person” named “G2-E2.” Equipped with the new GE Logitrol[®] 550 programmable control, it demonstrated the increased portability of GE’s newest control equipment—based on its smaller central processing unit. Compared to the GE Logitrol 500 unit, the Logitrol 550 unit costs less, uses less power and has the flexibility of a selectable memory.



Powermaker debut

Now under installation start-up testing for the Montana/Dakota Utility Company in Glendive, Mont., is the first GE MS6001 gas turbine, which is designed to augment the product line in the 35-40-

megawatt range. The MS6001 turbine can produce 40% more power at a 10% better heat rate, compared to the 25-mw MS5001, which has been the workhorse of the electric utility industry for many years.

Boosting efficiency

The challenge? Produce a motor that combines every engineering “trick” known today for reducing energy consumption. Just introduced, the new GE Super Saver Motors require 50% lower full-load current and provide a 60% reduction in electrical losses—based on test data comparing them to standard-design motors of equal ratings. Shown: Fort Wayne engineer Roy Mollenberg making a tachometer test on an industrial exhaust fan drive.



Recalling Alice Hamilton

GE industrial health pioneer

By Donna R. Carpenter



In 1936, First Lady Eleanor Roosevelt presented the National Achievement Award of Chi Omega to Dr. Alice Hamilton.



In the early part of this century, long before there was an Occupational Safety and Health Act, a woman physician named Alice Hamilton recognized the dangers of certain materials used in manufacturing processes. At the time, Dr. Hamil-

ton was working at Jane Addams' Hull House settlement in Chicago, along with a young engineer named Gerard Swope. The two were social crusaders, championing the rights of largely illiterate immigrants who were being victimized by sweat shops and corrupt politicians.

It was an off-beat sort of life for a woman who would become one of the nation's foremost authorities on industrial diseases, and for a man who would become the president of General Electric Company. And though the two would go their separate ways—the days they spent together at Hull House formed the basis of a life-long association.

Starting her career as a professor of pathology at the Women's Medical School of Northwestern

University, Dr. Hamilton quickly built a reputation, and in 1910 she was appointed medical investigator for the Illinois Commission on Occupational Diseases. A Commission report to the state governor led to a landmark law—the 1911 Illinois Occupational Disease Law—requiring protective clothing against exposure to lead, brass, zinc and other metals; respirators for protection against dust; locker facilities and showers; and other precautions. Dr. Hamilton shared her Commission experiences with Gerard Swope, and years later he would remember her expertise and hire her to do similar studies for General Electric.

Based on her outstanding work on the Illinois Commission, Alice Hamilton was honored by further appointments: in 1910, she was one of the U.S. representatives to Belgium's International Congress on Occupational Accidents and Disease, and three years later became a member of the U.S. Department of Labor, where she worked on chemical poisoning problems in industry. In 1919, she became the first woman to teach at Harvard.

Dr. Hamilton's experience at this time was largely in the area of toxic substances. In 1923, however, she got a chance to expand her hori-

zons in industrial health. The year before, Gerard Swope had been elected president of General Electric and, remembering Alice's studies in occupational safety, he asked her to become medical consultant to the Company.

GE had long been a pioneer in health and safety measures. As early as 1914, the GE Safety Committee, made up of representatives from eight plants, had recommended rubber gloves and goggles for employees who handled acid; leggings and asbestos gloves in the foundries; and adequate exhaust systems for dust and gases. GE also was one of the first to use welding helmets and steel-box-toe safety shoes.

But Swope wanted further recommendations that would cover the entire gamut of industrial hazards, and Hamilton's preeminence in the field of industrial diseases and poisons made her the logical person to undertake such a project.

Swope asked Charles Eveleth, head of the Schenectady plant, to give Alice Hamilton "every opportunity to see what we're doing," and she made the most of this freedom. Bringing along a team from the newly formed Harvard School of Public Health, she made a tour of the Schenectady, Lynn and Pittsfield plants.

In the area of Dr. Hamilton's specialty, the group found that GE used only a few poisonous substances, and recommended harmless compounds to replace them, as well as better safeguards in working with lead and mercury. In Pittsfield, she noted the use of a lead compound in manufacturing lead-oxide-pellet lightning arresters. She recommended, and obtained, a facility where employees doing such work could wash and shower before changing into street clothes at the end of shifts. In this way they would not only remove traces of lead from themselves, but would not carry the toxic material to their homes.

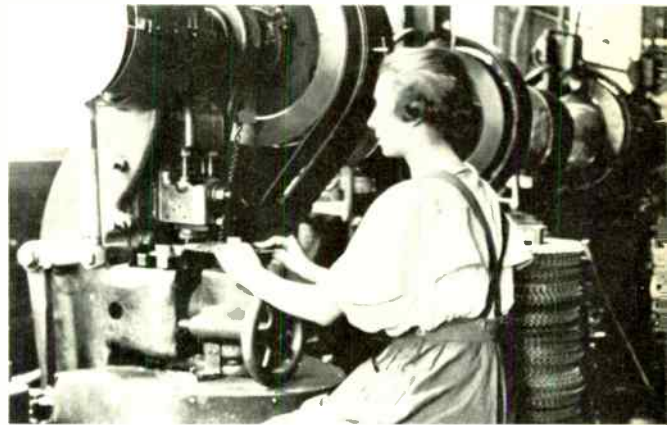
Innovative recommendations by Dr. Hamilton continued to be adopted at GE—ideas for improved sanitation, better plant hospitals, fatigue-reducing chairs and benches, and safer positioning of machines and procedures for materials-handling personnel.

In January 1924, in response to Dr. Hamilton's suggestion, GE opened a new Schenectady Works hospital with twice the previous hospital capacity. The next year, the first Companywide meeting of plant physicians was held to coordinate improvements in plant lighting, machine arrangement and other safety procedures. Until 1933, Hamilton made periodic visits to GE locations, studying work environments. After

one of her last visits, she suggested that something be done about asbestos dust in the Bridgeport, Conn., and York, Pa., plants. Gerard Swope hired her to consult with the GE manufacturing vice president until the problem was resolved.

Dr. Hamilton later said that her time at GE was a new experience in many ways. "I was dealing directly with the men in authority, so I was always sure my advice would be heeded. For the first time I found myself obliged to go into the less obvious and less direct hazards in industry . . . the underlying causes of fatigue—improper seating, dazzling lights, noise and vibration, lack of a nourishing midday meal . . . factors I had never paid much attention to when my mind was riveted on lead and mercury and nitrous fumes and benzol."

In her autobiography, she also wrote of Swope's never-failing support: "Gerard always was greatly interested in whatever I had to report. He never tried to defend the Company or explain, but saw to it that whatever I suggested was done." ▲



Even before Alice Hamilton visited GE plants to evaluate industrial hazards, the Company was a pioneer in preventive measures. Above, female factory worker wears garment protector, and right, employee is given physical exam at Schenectady dispensary circa 1917.



GENERAL ELECTRIC

General Electric Company
Fairfield, Connecticut 06431



'INTERCHANGE' EXECUTIVES ON TOUR. Since 1969, U.S. business executives have been gaining firsthand exposure to decision-making processes of Government employees—and vice versa—through the President's Executive Interchange Program. General Electric's connection, shown in Paris during a recent European conference (l to r): Department of Defense's Paul L. Sage, assigned to strategic

planning integration at GE in Fairfield; National Science Foundation's Sumiye "Sue" Okubo, now at Schenectady's R&D Center; and Bridgeport GE's Panagiotis "Takis" A. Argentinis, manager of Corporate Purchasing—International, working in Washington, D.C., as executive director of planning and budget coordination for the Office of the Comptroller of the Currency.