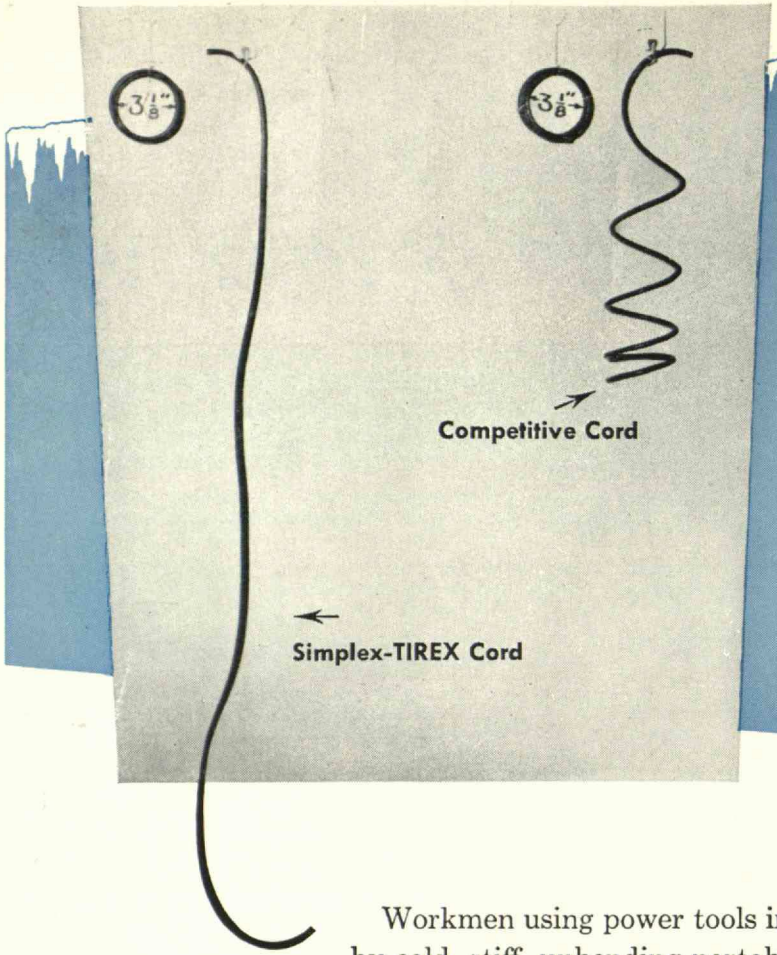
TECHNOLOGY REVIEW

December 1955



"Deep Freeze" tests prove Simplex-TIREX Cords stay more pliable when cold!

Workmen using power tools in winter weather find their work hampered by cold, stiff, unbending portable cords.

Recent tests show that Simplex-TIREX Cords are three times more pliable than other cords when cold.

Here is what we mean.

Two 5-foot lengths of 2-conductor No. 18 SJO cord were wrapped around a 3⅛-inch steel mandrel. One cord was TIREX and the other was a competitor's.

Both samples were locked up in a refrigerator for one month at 36°F.

They were attached to the panel while still in the walk-in refrigerator. The panel was carried outside and immediately photographed. Notice the results. TIREX, on the left, is limp and pliable. The other cord looks like a coiled spring.

Which would you want on your portable tools? You can get genuine TIREX from your electrical distributor.

Simplex

TIREX

SIMPLEX WIRE & CABLE CO.
79 Sidney Street, Cambridge 39, Massachusetts

THE TECHNOLOGY REVIEW, December, 1955, Vol. LVIII, No. 2. Published monthly from November to July inclusive at Emmett Street, Bristol, Conn. Publication date: twenty-seventh of the month preceding date of issue. Annual subscription $4.00; Canadian and Foreign subscription, $4.50. Entered as second-class matter December 23, 1949, at the Post Office at Bristol, Conn., under the Act of March 3, 1879.

To the man who intends to do creative engineering...

AIRESEARCH AIR DATA COMPUTER SYSTEM *integrates electronic, pneumatic and electrical components to automatically sense, measure and correct for all air conditions affecting flight.*

AiResearch is looking for your kind of engineer.

We have always been a pioneering company, constantly developing new products and searching out new and better ways of meeting the demands of modern civilization.

A sample of this ingenuity is our development of transducer-computer systems which simplify the job of flying. AiResearch also leads in the aircraft air-conditioning and pressurization fields. We are blazing the trail in overcoming the heat problem in jet flight. In the new, rapidly growing field of small turbomachinery we have more experience than all other companies combined. We produce more than 1000 different products, from unique air-valves that can operate under unprecedented temperature conditions to the most complicated complete systems. We work on the very frontier of present scientific knowledge.

That's why we need creative engineers . . . and appreciate them. You who qualify for an AiResearch position will receive stimulating assignments, utilize some of the finest research facilities in the country and be well rewarded financially.

Premium positions are now open for mechanical engineers ...electrical engineers...physicists...specialists in engineering mechanics...specialists in aerodynamics...electronics engineers ...aeronautical engineers.

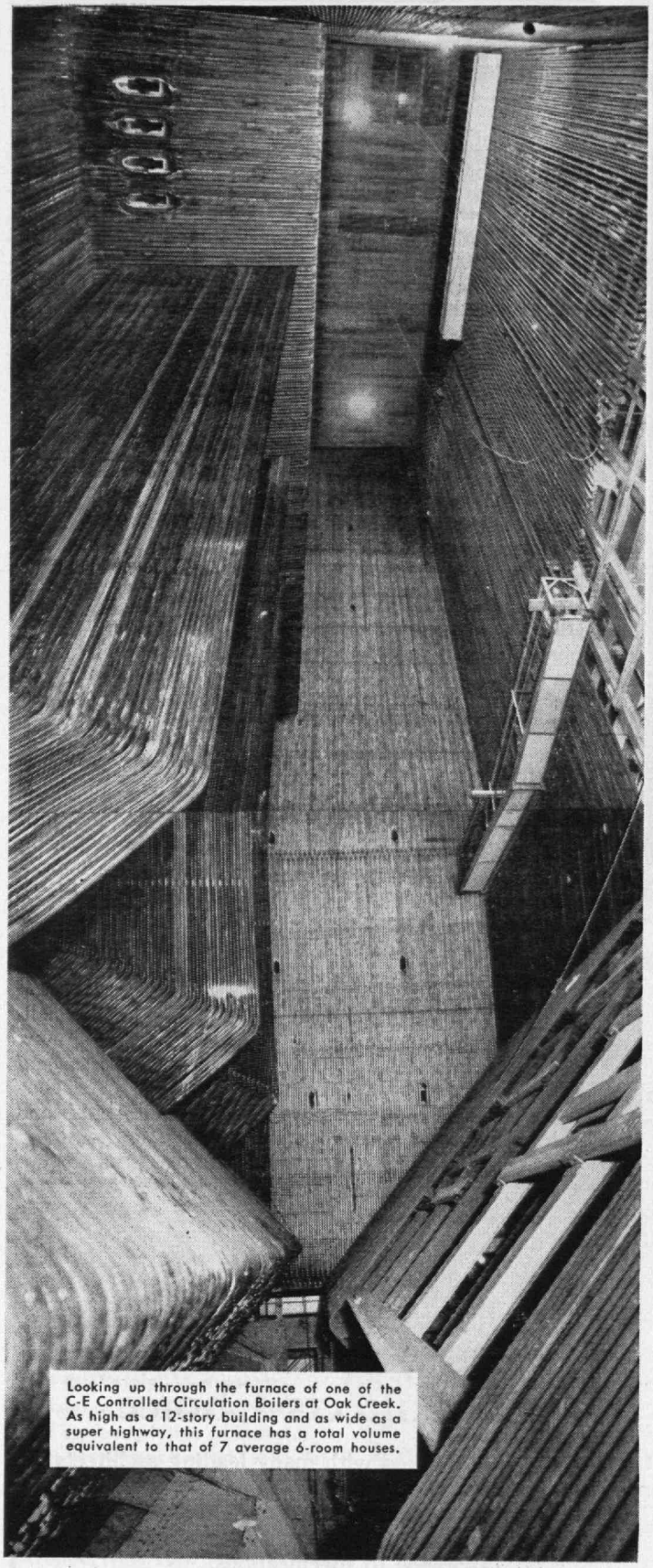
Write to Mr. Wayne Clifford, AiResearch Manufacturing Company, 9851 S. Sepulveda Blvd., Los Angeles 45, California. Indicate your preference as to location either in Los Angeles or Phoenix.

THE GARRETT CORPORATION

AiResearch Manufacturing Divisions

Los Angeles 45, California • Phoenix, Arizona

Designers and manufacturers of aircraft components: REFRIGERATION SYSTEMS • PNEUMATIC VALVES AND CONTROLS • TEMPERATURE CONTROLS CABIN AIR COMPRESSORS • TURBINE MOTORS • GAS TURBINE ENGINES • CABIN PRESSURE CONTROLS • HEAT TRANSFER EQUIPMENT • ELECTRO-MECHANICAL EQUIPMENT • ELECTRONIC COMPUTERS AND CONTROLS



Looking up through the furnace of one of the C-E Controlled Circulation Boilers at Oak Creek. As high as a 12-story building and as wide as a super highway, this furnace has a total volume equivalent to that of 7 average 6-room houses.

Wisconsin
Electric Power Company

A STORY OF PIONEERING

In the annals of America's great industrial achievements, a few names stand out. They are the pioneers, the companies whose work has advanced technology in major steps. Such a company in the field of power generation is the Wisconsin Electric Power Company. Its first big pioneering step was taken 35 years ago when it built . . .

A power plant that made Milwaukee famous

In 1920, the use of pulverized coal as a fuel for boilers was virtually unknown in the utility industry. Wisconsin Electric, after 5 years of development work in an older plant, took the bold step of designing a large new power station (the Lakeside Station) for the exclusive use of pulverized coal. Lakeside not only proved the practicability of pulverized coal but became the world's most efficient power station. Power engineers from all parts of the country and abroad came to Milwaukee to observe and learn. Pulverized coal made a major contribution to the economy of power generation and has long since become the universal method of burning coal in electric power stations.

Wisconsin Electric took its next big forward step in 1930 when it started construction of its Port Washington Station.

Port Washington set new efficiency record

Port Washington was unique among American power stations in that it not only set a new efficiency record during its first years of operation but maintained its position as *the world's most efficient power station* for 13 years. It had other claims to fame as well. Its boilers were the largest high-pressure boilers then built and established new reliability records in service.

And then came Oak Creek

Now Wisconsin Electric has erected another landmark on its "road of achievement" with its new Oak Creek Station, placed in service in late 1953. Oak Creek, like its famous predecessors in the Wisconsin system, introduces important innovations in design and is noteworthy among the outstanding power stations of today.

• • •

And what is Combustion Engineering's part in the Wisconsin Electric story? Just this. Combustion pioneered pulverized coal burning from the manufacturer's side, and designed and built all the pulverized coal equipment installed at Lakeside, Port Washington and Oak Creek. It supplied the boiler units installed in the Port Washington Station. And at Oak Creek, Wisconsin Electric now has in service two of Combustion's most advanced type of controlled circulation boilers, with a third being installed.

Wisconsin Electric, pursuing its forward looking policy, was among the first to recognize the special advantages of the controlled circulation boiler which, in the past five years, has achieved an acceptance by utilities never before accorded a basically new design. B-856

COMBUSTION ENGINEERING

Combustion Engineering Building • 200 Madison Avenue, New York 16, N. Y.

C-E

BOILERS, FUEL BURNING & RELATED EQUIPMENT; PULVERIZERS, AIR SEPARATORS AND FLASH DRYING SYSTEMS; PRESSURE VESSELS; AUTOMATIC WATER HEATERS; SOIL PIPE

THE TABULAR VIEW

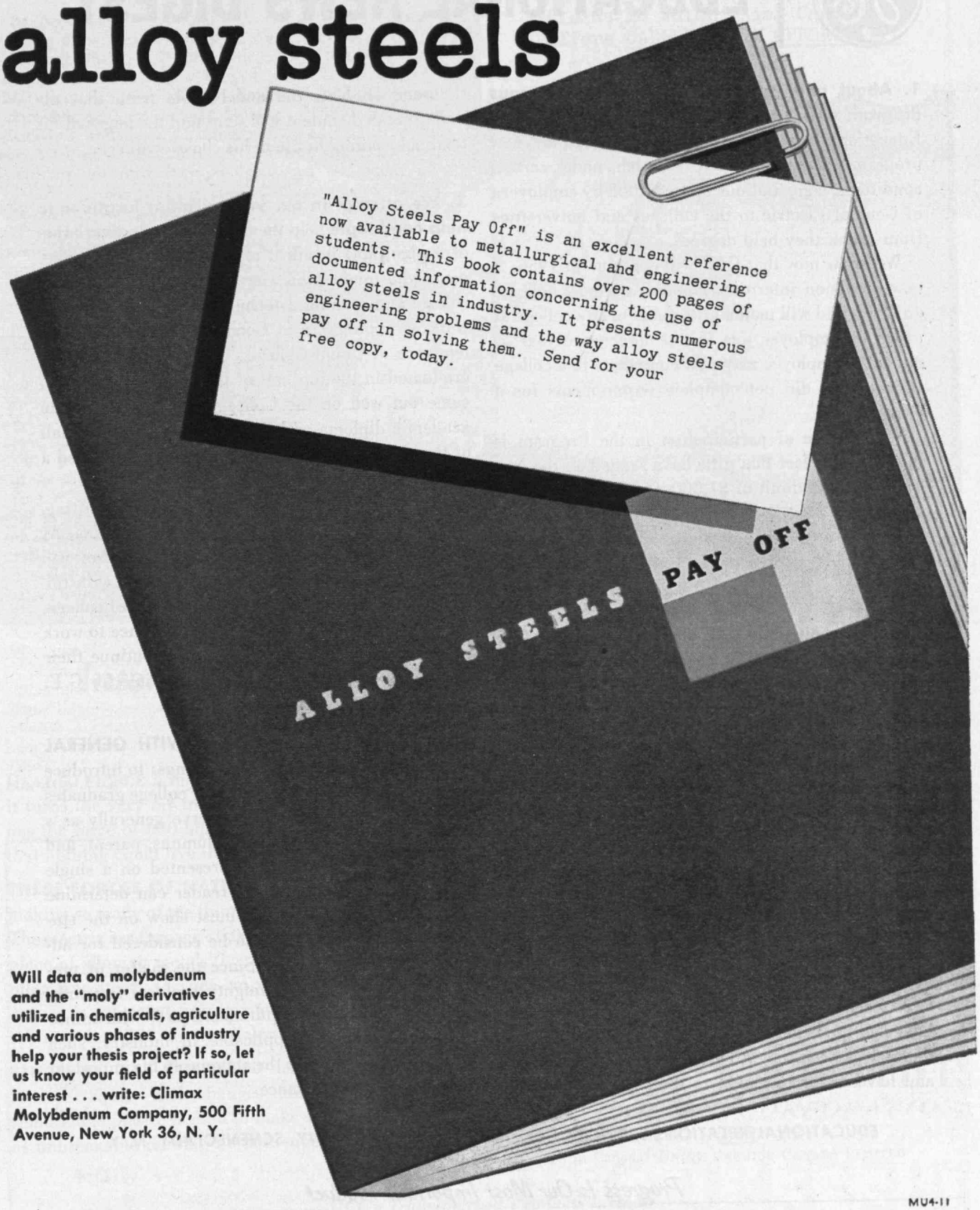
Industrial Liaison. — In operation since 1948, the M.I.T. Industrial Liaison Program, established to provide close technical contact between M.I.T. and industrial research, is described (page 87) by EUGENE B. SKOLNIKOFF, '49. Mr. Skolnikoff received the S.B. and S.M. degrees in 1950 (Course VI-A), then studied philosophy and economics as a Rhodes scholar at Oxford University from which he received the B.A. degree in 1952. He has spent two and one-half years with the Industrial Liaison Office at M.I.T.

Excellence First. — In "Engineering Education and National Spirit" (page 91), JULIUS A. STRATTON, '23, makes a strong case for that kind of engineering education that develops "personal responsibility . . . with ready willingness to minister to the public welfare." Dr. Stratton has had a distinguished career as professor of physics, member of the staff of the Radiation Laboratory, head of the Research Laboratory of Electronics, and since 1952 as vice-president and provost of M.I.T.

Distaff Doings. — Ever wonder what makes young ladies want to study at M.I.T. — how their technical training benefited them in later years? Answers to these and other interesting questions about Alumnae are given (page 94) from the women's point of view. The article on coeds summarizes the results of a survey made by the Registration Committee of the M.I.T. Women's Association in co-operation with the Office of the Dean of Students. For the preparation of this report, as well as for the article in this issue, The Review is indebted to: Ruth L. Bean, Assistant Dean of Students, and the following ladies who served as officers of the M.I.T. Women's Association when the survey was conducted in 1953: Mary E. Guinan, 2-44, President; Gladys P. Lyons, 6-45, Vice-president; Katherine S. (Mrs. Harold L.) Hazen, '28, Recording Secretary; Grace G. Farrell, '29, Treasurer.

Good Riddance. — Aided by widespread vaccination practices, medical science has virtually eliminated smallpox from the American scene. But, as JAMES A. TOBEY, '15, points out (page 97), this was not always so, and the disease was often a scourge in America. Dr. Tobey has achieved an outstanding career in public health and public health law.

60 case histories of alloy steels



Will data on molybdenum and the "moly" derivatives utilized in chemicals, agriculture and various phases of industry help your thesis project? If so, let us know your field of particular interest . . . write: Climax Molybdenum Company, 500 Fifth Avenue, New York 36, N. Y.

MU4-11

CLIMAX MOLYBDENUM

EDUCATIONAL NEWS DIGEST

1. About one year ago a Corporate Alumnus Program was established by the General Electric Educational and Charitable Fund. Through this new program, the Fund agreed to match, under certain conditions, contributions up to $1,000 by employees of General Electric to the colleges and universities from which they held degrees.

We know now that CAP will continue in 1956. A new provision interprets *alumnus* as most colleges do: the Fund will match gifts made to any college at which an employee was *in attendance* one year or more. An employee may now contribute to a college at which he did not complete requirements for a degree.

Wide range of participation in the Program is shown by the fact that gifts have ranged all the way from $1 to the limit of $1,000. On October 1, there were 3,113 contributions to 285 colleges, totaling $116,877; any alumnus who reads his mail knows that the modest gifts count as they never counted before.

* * *

2. A fifth university will start offering the G-E Fellowship Program for high-school teachers in the summer of 1956; Syracuse University will conduct a program in science for 50 high-school teachers. This particular program—like those in science and math, in Union, RPI, Case, and Purdue—will be underwritten by General Electric from the time the teacher leaves home till he returns six weeks later. These five challenging programs are at graduate levels. Our participation also includes scheduled lectures and trips to plants and laboratories to hear and observe how mathematics and science are used in modern business.

The Teacher Fellowships Program began in 1945 at Union, and that summer there was but one session of 50 teachers. By now, approximately 1,350 teachers have had the benefit of these special programs, have themselves been taught by distinguished professors, and have in turn brought to their several hundred thousand students the undebatable truth that the well-grounded student will soon find the pages of his textbook coming to life in his chosen career.

* * *

3. We attempt in our various plant locations to help our people help themselves. Here's a variation of a plan, now in effect at Schenectady: 35 young men, who might otherwise have foregone going to college and earning a technical degree, are now at work as apprentices at General Electric and in attendance at Union College. These young men were graduated in the top half of their high-school class, came out well on the College Board tests, had an academic diploma with 16 full credits (almost half of them in English and math), and demonstrated a genuine desire for a college education.

These men are full-time apprentices in drafting, machining, pattern making, and metal founding. At the end of 8,000 hours of apprenticeship, they will have completed, after business hours, and with tuition paid by the Company, two full years of college. They may then apply for a leave of absence to work for a degree on a full-time basis, or continue their educations at night, still working full time for G.E.

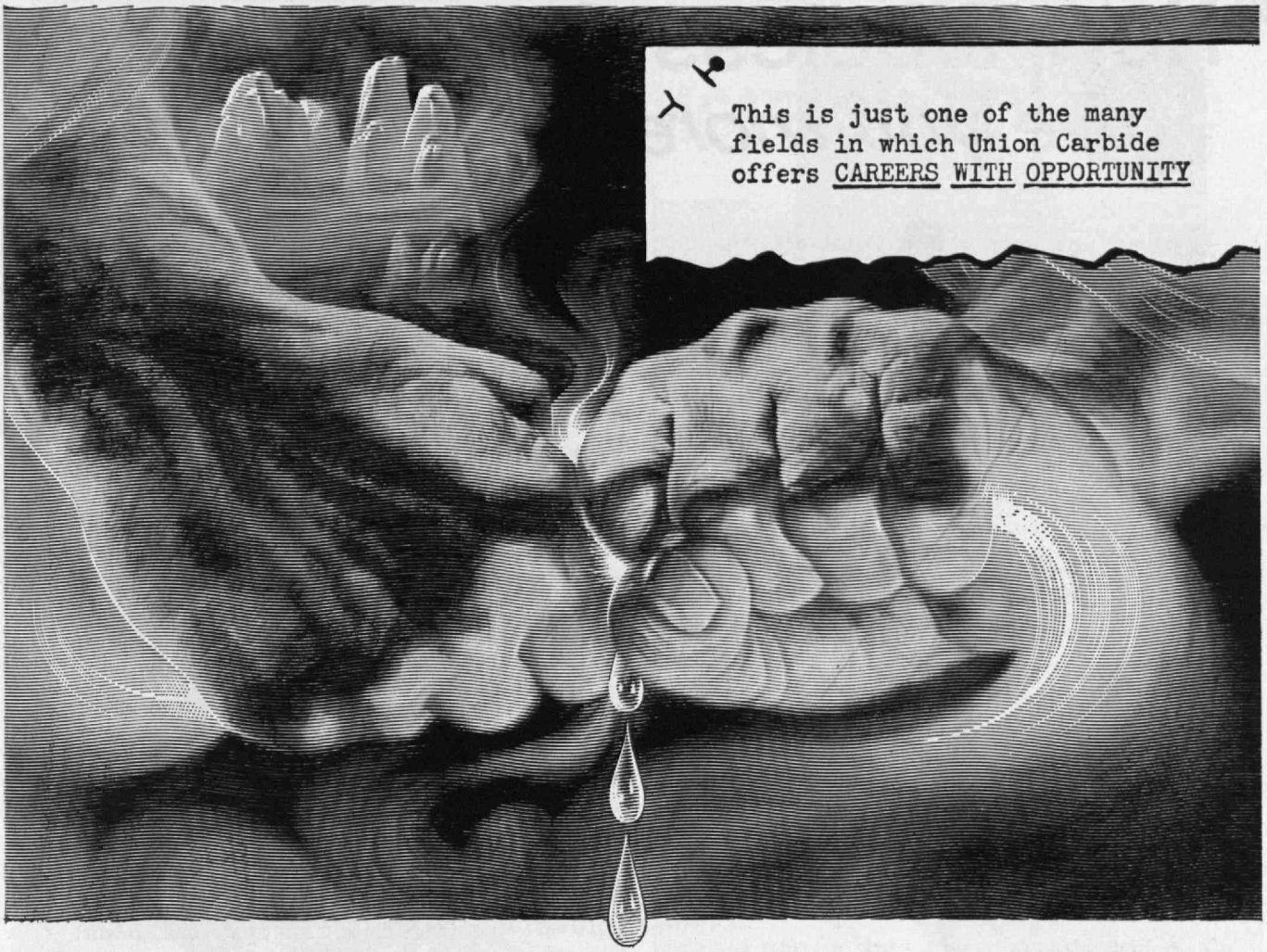
* * *

4. A new booklet, GROWING WITH GENERAL ELECTRIC, is designed to do two things: to introduce General Electric's 10 Programs for college graduates to potential employees and to serve generally as a guidance tool in the hands of alumnus, parent, and instructor. Each Program is presented on a single page in such a way that the reader can determine immediately what "majors" must show on the student's record if he wishes to be considered for admission to that Program. Since the matter of prerequisites looms up as a mighty problem to youth, and since the stated requirements are, with minor variations, generally applicable in industry, such information should help the alumnus in his important function of youth guidance.

EDUCATIONAL RELATIONS SERVICES, GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC



Intense Cold...Fierce Heat...Terrific Pressure

—forces of nature used by UCC scientists to work for you

HEAT SO FIERCE it makes steel boil . . . cold so intense it turns the very air to liquid . . . pressure so great it has the force of 600 hurricanes . . . space so "empty" that nothing could live in it.

THESE FORCES OF NATURE are used by industry in making so many of the things we take for granted today. The electric arc furnace—6,000 degrees hot—is the birthplace of alloying metals that go into stainless steel and other fine steels. Oxygen, so vital to medicine and industry, is extracted from air made liquid when cooled to more than 300 degrees below zero.

ETHYLENE GAS SQUEEZED under pressure of 15 tons per square inch changes into polyethylene. This remarkable plastic is used to make such familiar things as unbreakable nursing bottles, squeeze-spray containers, and transparent wrappings. Exposing natural gas to terrific pressures and the "nothingness" of vacuum have been key steps in making hundreds of new chemicals during the last 20 years.

THESE ARE BUT A FEW examples of how industrial scientists such as those of Union Carbide have discovered how to use the forces of nature to create the new processes and products necessary to America's progress.

STUDENTS AND STUDENT ADVISERS: *Learn more about career opportunities with Union Carbide in* ALLOYS, CARBONS, CHEMICALS, GASES, *and* PLASTICS. *Write for booklet H-2.*

UNION CARBIDE
AND CARBON CORPORATION

30 EAST 42ND STREET UCC NEW YORK 17, N. Y.

In Canada: UNION CARBIDE CANADA LIMITED

UCC's Trade-marked Products include

ELECTROMET Alloys and Metals · NATIONAL Carbons · ACHESON Electrodes · SYNTHETIC ORGANIC CHEMICALS · HAYNES STELLITE Alloys · PREST-O-LITE Acetylene · Dynel Textile Fibers · PRESTONE Anti-Freeze · UNION Carbide · LINDE Silicones · EVEREADY Flashlights and Batteries · PYROFAX Gas · BAKELITE, VINYLITE, and KRENE Plastics · LINDE Oxygen

New Tubeless Suburbanites
give you more go in snow!

See how the skier angles his skis to walk right up the slope. His ski edges cut into the snow in a "herringbone" pattern—let him climb that steep hill with a minimum of trouble.

Goodyear's great Suburbanites have the logical winter tread design. It works the same way as skis in the "herringbone." Four rows of sharp-edged cleats are angled to bite into the snow—give you a *surer* grip on the road. This wide winter tread is made of 464 cleats with 1856 sharp edges. They dig in like claws for greater traction in snow and mud—a better grip on ice.

Don't let a surprise, heavy snowfall delay you. See your Goodyear dealer—get Suburbanites for your car today. Goodyear, Akron 16, Ohio.

MORE PEOPLE RIDE ON GOODYEAR TIRES THAN ON ANY OTHER KIND!

On cleared highways, its flat tread runs more quietly, smoothly. Suburbanite cleats are flexible, so the tread cleans itself as it rolls—it's always ready to grip. Also available in a conventional winter tire for use with tube.

SUBURBANITE WINTER TIRES
by GOODYEAR

Suburbanite, T.M., The Goodyear Tire & Rubber Company, Akron, Ohio

Look for this sign; there's a Goodyear dealer near you.