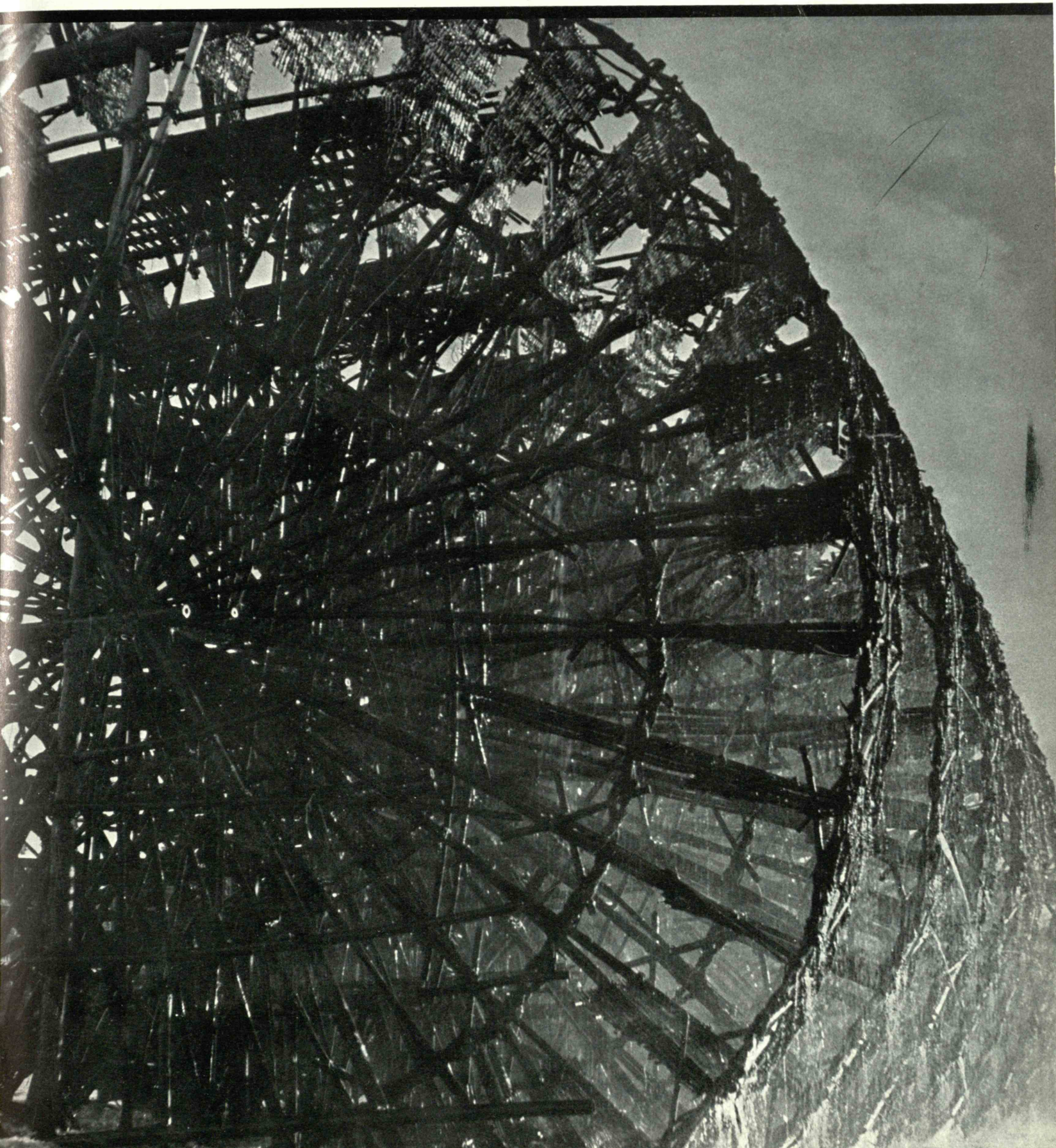
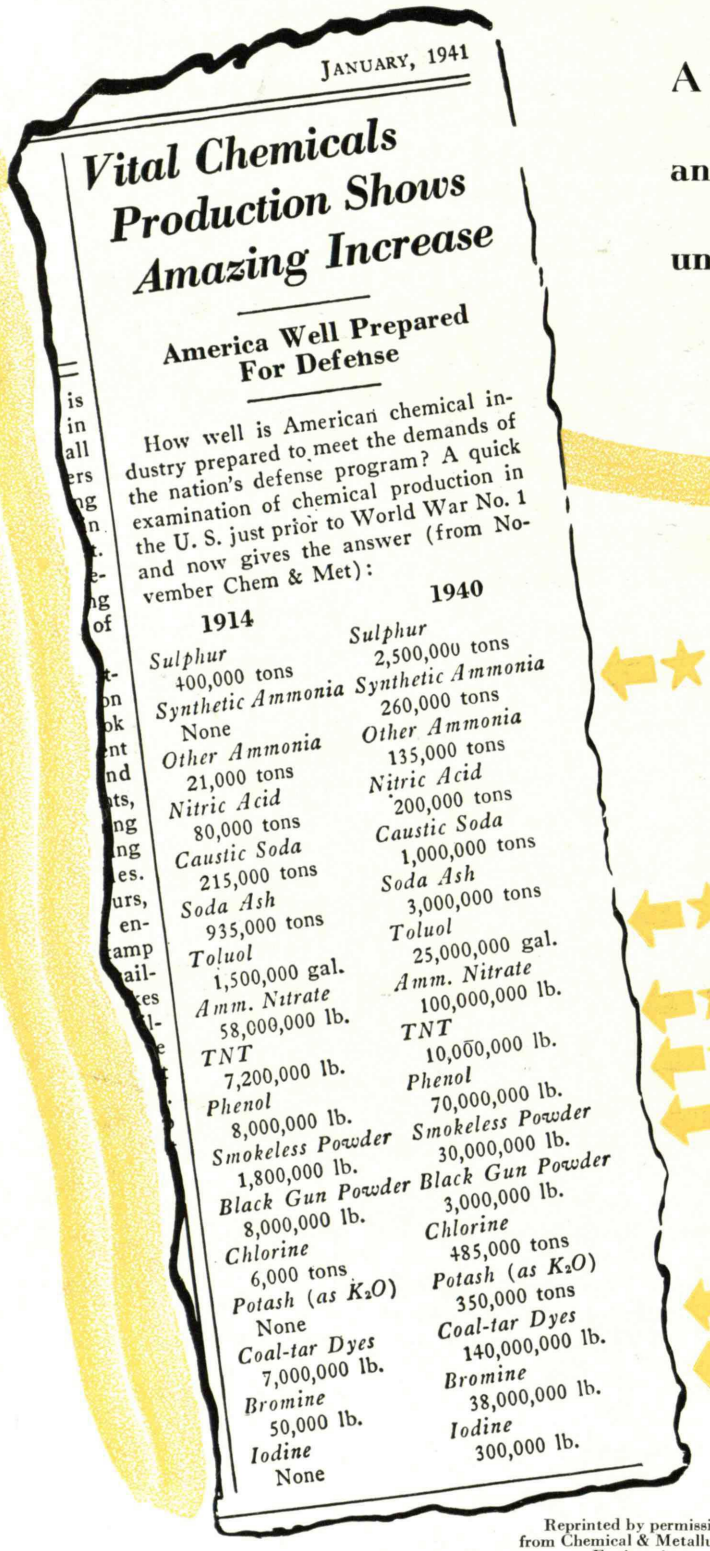
April 1941

TECHNOLOGY REVIEW



BADGER

A name long identified with the design and construction of complete plants and units producing many of our essential chemicals



JANUARY, 1941

Vital Chemicals Production Shows Amazing Increase

America Well Prepared For Defense

How well is American chemical industry prepared to meet the demands of the nation's defense program? A quick examination of chemical production in the U. S. just prior to World War No. 1 and now gives the answer (from November Chem & Met):

1914	1940
Sulphur 400,000 tons	*Sulphur* 2,500,000 tons
Synthetic Ammonia None	*Synthetic Ammonia* 260,000 tons
Other Ammonia 21,000 tons	*Other Ammonia* 135,000 tons
Nitric Acid 80,000 tons	*Nitric Acid* 200,000 tons
Caustic Soda 215,000 tons	*Caustic Soda* 1,000,000 tons
Soda Ash 935,000 tons	*Soda Ash* 3,000,000 tons
Toluol 1,500,000 gal.	*Toluol* 25,000,000 gal.
Amm. Nitrate 58,000,000 lb.	*Amm. Nitrate* 100,000,000 lb.
TNT 7,200,000 lb.	*TNT* 10,000,000 lb.
Phenol 8,000,000 lb.	*Phenol* 70,000,000 lb.
Smokeless Powder 1,800,000 lb.	*Smokeless Powder* 30,000,000 lb.
Black Gun Powder 8,000,000 lb.	*Black Gun Powder* 3,000,000 lb.
Chlorine 6,000 tons	*Chlorine* 485,000 tons
Potash (as K_2O) None	*Potash (as K_2O)* 350,000 tons
Coal-tar Dyes 7,000,000 lb.	*Coal-tar Dyes* 140,000,000 lb.
Bromine 50,000 lb.	*Bromine* 38,000,000 lb.
Iodine None	*Iodine* 300,000 lb.

Reprinted by permission from Chemical & Metallurgical Engineering

ONE CONTRACT UNDIVIDED RESPONSIBILITY

Badger Units and Complete Plants have played an important part not only in the tonnage of chemicals produced in the year 1914, but in the startling increase in tonnage since then.

All of Which Implies extensive experience in plant design for the production of chemicals. Coupled with this is experience gained by work in other divisions of the processing industry.

Badger Services are available to any extent—economic studies, research, design, process, equipment for part of plant or a complete plant operating to meet guarantees.

★

1841-1941

One Hundred Years of Service

★

E. B. BADGER & SONS CO.

Boston, Mass.

New York Philadelphia San Francisco London Paris

Chemical Engineers and Contractors Specializing in Distillation, Evaporation, Extraction and Solvent Recovery

THE TECHNOLOGY REVIEW, April, 1941. Vol. XLIII, No. 6. Published monthly from November to July inclusive at 10 Ferry Street, Concord, N. H. Publication date: twenty-seventh of the month preceding date of issue. Annual subscription $3.50; Canadian and Foreign subscription $4.00. Entered as second-class matter at the Post Office at Concord, N. H., under the Act of March 3, 1879.

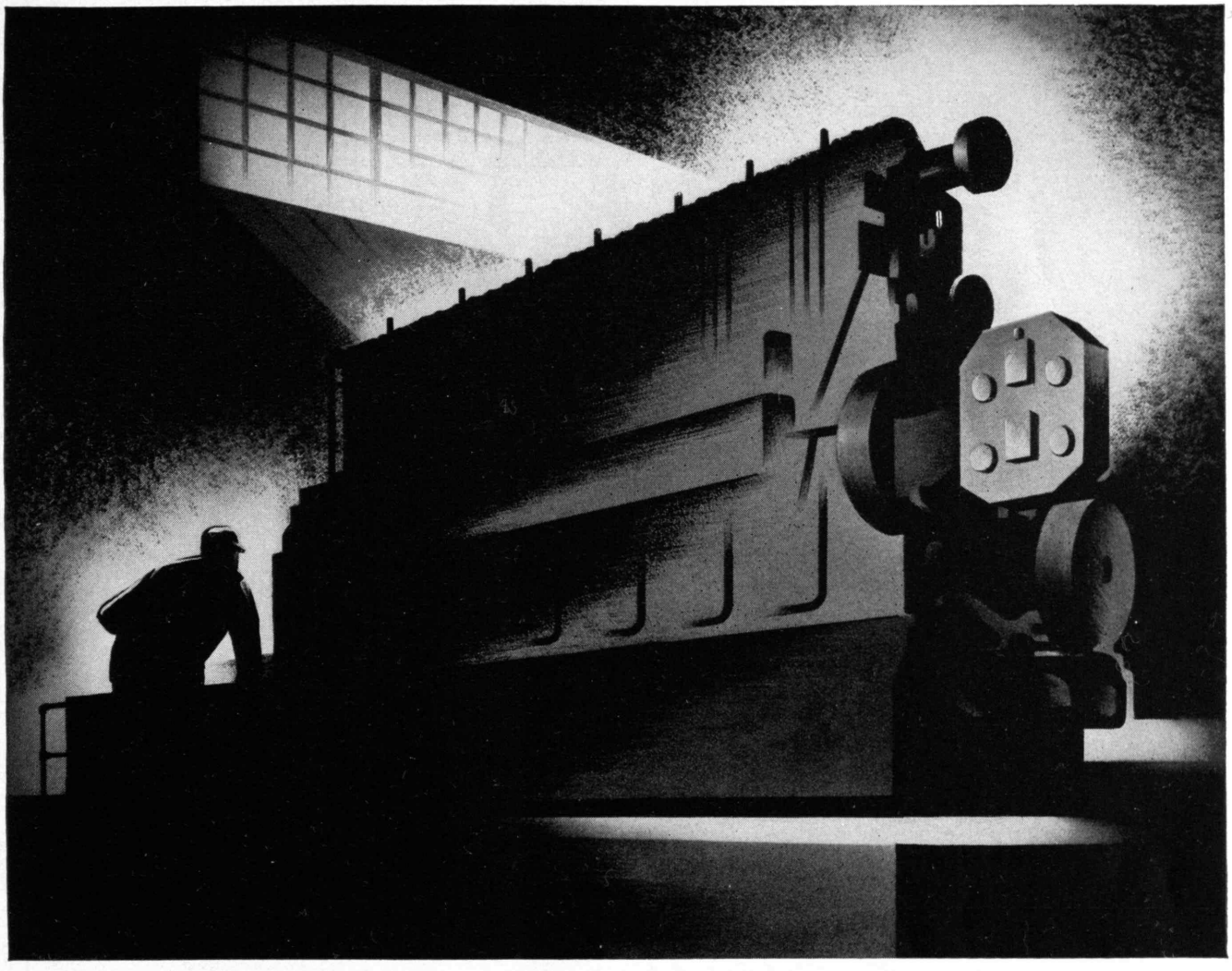
THE TABULAR VIEW

Isentropic. — As the air becomes more and more the front line of war, knowledge of air fronts in meteorological terms has become of greater and greater military value. Long-range weather forecasting may hence be a useful by-product of the present struggle, and thus again the stimulation of meteorological knowledge by martial demands will have been demonstrated. The relationship between war and weather is sketched in this issue of The Review (page 247) by SVERRE PETTERSSEN, Professor of Meteorology in charge of work in the subject at the Institute. Dr. Petterssen's explanation of advanced methods of air-mass analysis has the authority of his distinguished career as one of the group of Scandinavian students of the weather upon whose work modern technique is based. Before coming to Technology in 1939 to take charge of meteorological research, Dr. Petterssen headed for seven years the Forecasting Institute in Bergen, Norway.

Unlike Likes. — Talk being so familiar a phenomenon, the interest which men take in analysis of it is the more readily understandable. Chief difficulty with many discussions of the ubiquitous subject, however, is that such discussions offer little which is basically new. The penetrating essays which BENJAMIN LEE WHORF, '18, has earlier contributed to The Review have rightly been regarded as exceptional by readers, some of whose comments have appeared in our Mail Returns column. In the present issue (page 250) Mr. Whorf pushes his inquiry farther, showing how some languages resemble chemical compounds in the way their sentences are constructed, and others resemble mechanical mixtures. Mr. Whorf's studies in speech and logic are the outgrowth of an avocation commenced over a decade ago. He has lectured on linguistics at Yale.

Atomic Geometer. — To BERTRAM E. WARREN, '24, Professor of Physics at the Institute, diffraction of x-ray beams by various materials has disclosed rare and interesting knowledge of the infinitesimal worlds within crystals, liquids, and glass. His work on the structure of water was reported in The Review for February, 1939. In this issue (page 253) Professor Warren discusses how the geometrical demands of atoms govern the structure of glass. His article reports advances in this field of research which have been made since Philip M. Morse, Professor of Physics and Editorial Associate of The Review, summarized the situation in our issue for April, 1937.

To Instruct. — After varied executive experience in metallurgical industries, A. C. CARLTON, '17, became a teaching administrator through his post as curator of fuels and metals in the Chicago Museum of Science and Industry, which he describes for The Review (page 256) as an example of the modern museum in its function as an educational institution.



THREE JOBS...ONE IRON

Versatility in cast iron — especially when economically obtained... is a valuable asset for both the foundry and the user.

Consider, for example, the experience of a manufacturer of Diesel engines — and the economies effected by using one base iron to meet three distinct sets of requirements. One set calls for ability to resist wear and hold pressure at operating temperatures, the second for toughness and pressure resistance at the same temperatures, and the third for the wear resistance and toughness essential for timing gears and similar parts. Good machinability is, of course, a prime requisite in all three cases.

All these varied requirements are being met by using the same Chromium-Molybdenum (0.60—0.70% Mo.) base iron; only slight changes in the analysis are necessary. The practical and economical advantages to the foundry are obvious. And the user benefits by getting reliable, machinable parts at reasonable cost.

Our booklet, "Molybdenum in the Foundry", is both interesting and helpful. A copy will be sent to all those interested free on request.

PRODUCERS OF MOLYBDENUM BRIQUETTES, FERRO-MOLYBDENUM, AND CALCIUM MOLYBDATE

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MOLY

MAIL RETURNS

Australia at War

From an Alumnus in Australia recently came to President Compton the letter below, which The Review is privileged to publish. Written on January 7 of this year, it gives in summary form an understanding of the determination and courage which have had other gallant expression in lands far from the Antipodes.

FROM UTAR JAMES NICHOLAS, '08:

Receipt of your annual President's Report for 1939–1940 has inspired me to write to you for the first time since my graduation in 1908. We Australians deeply appreciate promise of vast help outlined in President Roosevelt's inspiring message to Congress on January 6.

Fellow students at Technology in my day thought that Australia was a country of kangaroos, boomerangs, and bushwhackers. Today we are manufacturing and delivering airplanes, tanks, guns, rifles, and ammunition on a scale never before believed possible in this country. Our Australian diggers are fighting in North Africa. All are volunteers, for we have no conscription. Fifty thousand airmen — pilots and crews — are training for the Empire Air Scheme.

I cheerfully pay one-half of my income to the income tax department and will willingly pay still more when necessary. For we are going on — no matter what the cost in blood and treasure — until we are secure. We are all intensely loyal to our King. When we have reverses, the rate of recruiting is doubled or trebled, thus showing the temper of the people. . . .

Like Australia, you are far removed from the din of battle. May it never reach your shores.

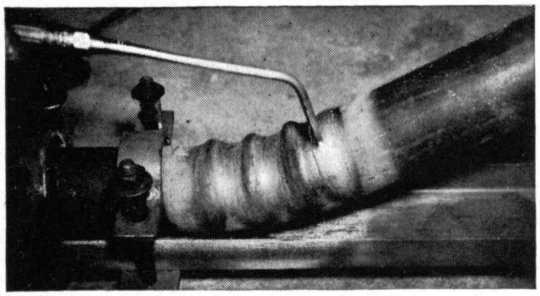
Melbourne, Australia

Here are a few of the things you can do—

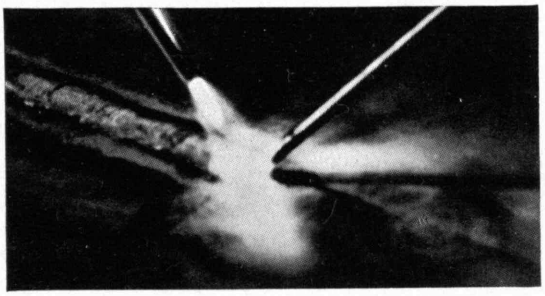
with the help of these dependable products . . .

In practically every industry—large or small—oxy-acetylene processes are used to speed production—to improve results—to lower costs—and to maintain efficiency of plant and equipment. A few of the things you can do with the help of Linde Oxygen, Prest-O-Lite Acetylene, and Union Carbide are outlined here.

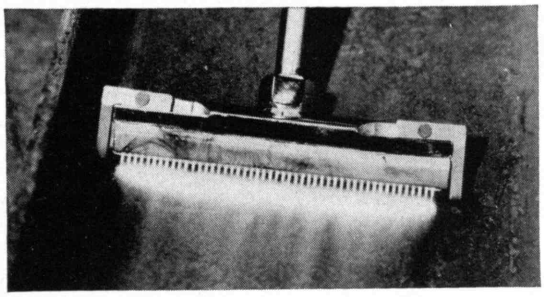
Shape Steel—Fast and economical flame-cutting reduces machining, grinding, and chipping operations. There are hand-cutting blowpipes and cutting machines for almost every cutting, gouging, and shaping need.



Form Metals—The oxy-acetylene flame is being used increasingly for such operations as "wrinkle-bending" of pipe and for straightening damaged metal sections. It should be applied where intense heat is required.



Join Metals—Oxy-acetylene welding makes it possible to join practically any metals, similar or dissimilar. Production oxy-acetylene welding is used wherever speed, strength, and good appearance are required.



Treat Metals—Oxy-acetylene flames are used both to surface-harden and to anneal steel and iron parts. The same flames are used for descaling to facilitate machining, and for cleaning to make paint last longer on steel.

Linde has the organization and the experience to help you use Linde products and processes profitably. If you want to know more about how to use the processes outlined above, *ask Linde!*

THE LINDE AIR PRODUCTS COMPANY
Unit of Union Carbide and Carbide Corporation
UCC
Offices in New York, Chicago, San Francisco, Kansas City, Birmingham, and other Principal Cities
In Canada: Dominion Oxygen Company, Limited

LINDE OXYGEN . . . PREST-O-LITE ACETYLENE . . . UNION CARBIDE . . . OXWELD APPARATUS

IN modern blitzkrieg armored forces must travel far and fast without breakdown or delay. Yet even the heaviest steel tank treads are surprisingly short-lived under the grind and pound of field operations. Engineers thought of shoeing these caterpillar-footed treads with rubber, since rubber far excels metal in resisting abrasive wear. Tests proved it was the answer. Not only do these rubber-armored treads long outwear naked steel, but they give Uncle Sam's new iron cavalry greater maneuverability, greater speed to deliver a knockout punch. Industry too finds this rubber-armoring process of great value in protecting equipment used in handling ores and other highly abrasive material. The G. T. M. (Goodyear Technical Man) will be glad to tell you about it. Write: Goodyear, Akron, Ohio or Los Angeles, California — or call the nearest Goodyear Mechanical Rubber Goods Distributor.

THE GREATEST NAME IN RUBBER
GOODYEAR

Chester H. Pope, '09

Brocade and a Bali drummerboy

VOLUME 43 NUMBER 6

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