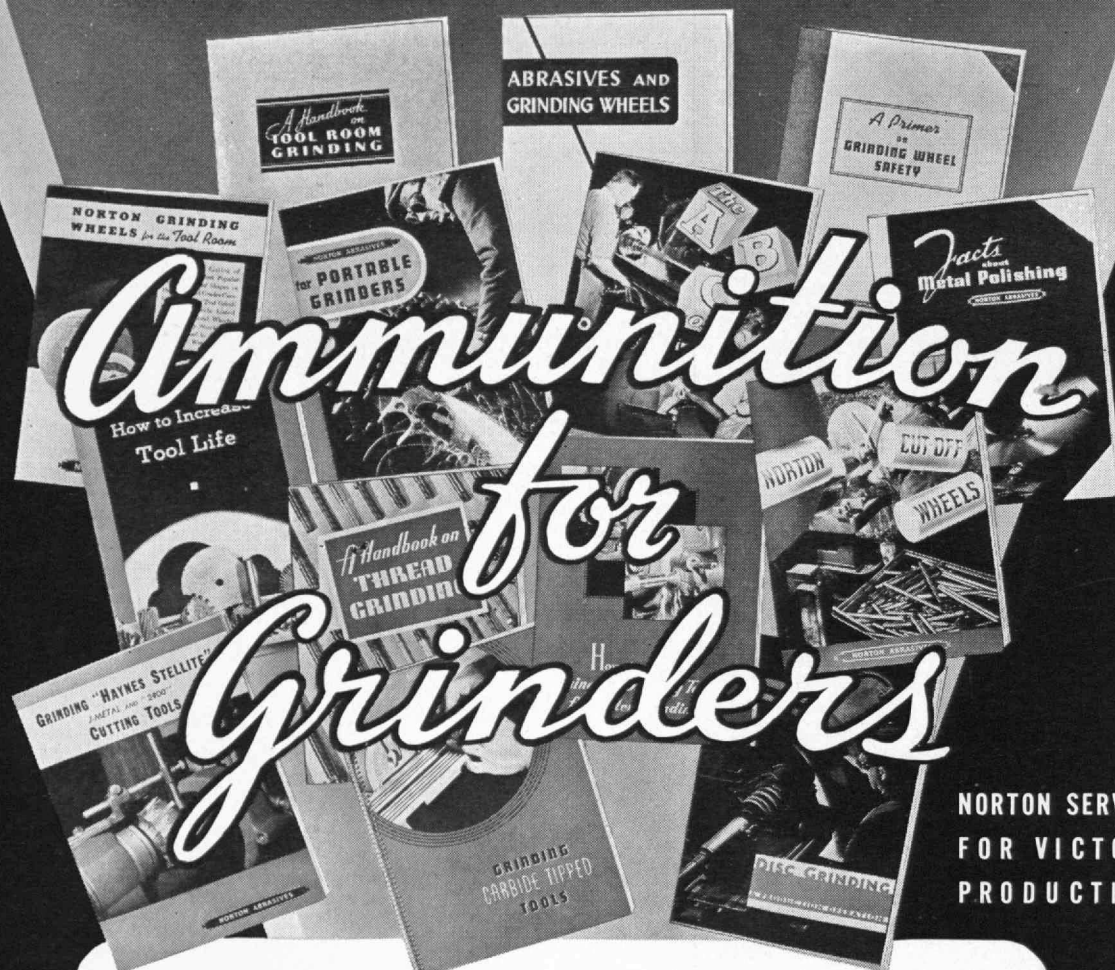


January 1943

TECHNOLOGY REVIEW

Title Reg. in U. S. Pat. Office





**NORTON SERVICE
FOR VICTORY
PRODUCTION**

Your factory's grinding problem may be with the carbide tipped tools

- or precision grinding of the cylindrical type
- or surface grinding
- or internal grinding

Printed information on these subjects is a part of Norton Service — along with motion picture instruction, training courses and engineering service.

All these types of service are available wherever needed.

What subject covered by any of the above booklets is bothering you now?



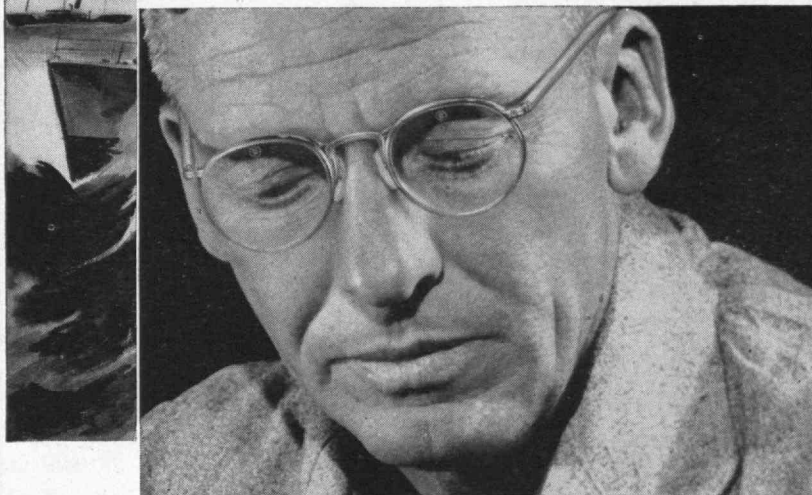
NORTON ABRASIVES

NORTON COMPANY • WORCESTER, MASS.

BEHR-MANNING DIVISION • TROY, N. Y.

Keep Vital Supplies Moving Forward ON SCHEDULE

By Protecting Workers' Eyes



*"The time has come when we must utilize every hour capable of producing war equipment. Those lost through accidents prolong the war and cause needless sacrifice."— Lt. General Brehon Somervell, Commanding General, Services of Supply.**

You can do *your* part in speeding up production of urgent provisions and equipment for our fighting forces by eliminating eye accidents in your plant.

American Optical Company, pioneer manufacturer of prod-

ucts to aid and protect vision can help you. AO offers you a complete line of easy-to-wear protective goggles—a special design for every type of eye hazard . . . posters . . . guides and charts for correct eye protection . . . the services of an expertly trained and highly experienced AO Safety Representative to work with your own Safety Director.

*From U. S. Army Safety Program Folder, "Conserve Man-Power for War-Power."

American Optical

COMPANY
SOUTHBRIDGE, MASSACHUSETTS



Wartime readjustments . . . #3



MONKEY-WRENCHES don't mean much to Mother. Father is sure the old sewing machine can be spared! Salvage is sometimes painful—but, besides aiding war production, it has its helpful side in the home.

It shows what we can do without. It teaches the difference between little luxuries and big necessities.

The same sort of adjustment, applied to income, puts taxes, War Bonds and life insurance at the top of the list. Both taxes and bonds advance the war effort directly. Life insurance does the same thing indirectly—since much of your premium dollar is reinvested in Government bonds. *Life insurance also protects your family at a time when they need protection more than ever before!*

Life insurance is the *safest, surest* property you can own—and it has a

guaranteed value that doesn't vary. The liberal New England Mutual contract even helps finance itself if the need arises! Ask one of our *Career Underwriters* how it's done.

Here are some of the advantages of a New England Mutual contract

1. **DIVIDENDS** begin at the end of the *first* year.
2. **CASH VALUES** begin at the end of the *second* year.
3. A **PREMIUM LOAN** is available toward payment of the *second* annual premium.
4. **CONVERSION** to Retirement Income or higher premium plans requires the payment of difference in reserves only.

Here's help with insurance salvage!

Metal scrap may cause family scraps—but the problem is not nearly so tough or technical as another kind of salvage—*savings* salvage. Most families make their largest investment in life insurance—and too often endanger that investment by sudden decisions.

If you must adjust your insurance program, get sound advice *first*. Talk to any of the men listed below. They're alumni of your college and they talk your language. They are also trained representatives of the First Mutual Life Insurance Company Chartered in America.

Out of their experience you'll get *practical*, constructive suggestions. They'll help you make the most of your limited life insurance dollars—help you protect your present policies with premium loans if necessary.

Check your protection *now when you need it most*. If none of these men is near you, you can get similar service at the New England Mutual office in your city.

RAYMOND P. MILLER, '18

Salem

■

ARTHUR C. KENISON, '19

Boston

■

BLAYLOCK ATHERTON, '24

Nashua

New England Mutual Life Insurance Company of Boston

George Willard Smith, President

Agencies in Principal Cities Coast to Coast

THE FIRST MUTUAL LIFE INSURANCE COMPANY CHARTERED IN AMERICA—1835

We're making readjustments, too. With some 15% of our field force now in military service, we have real opportunities for able men in several cities.

If you're interested in a career where you can be your own boss—and if your draft status is reasonably assured—we'd like to talk things over. Or perhaps you have a friend who might appreciate the tip.

In either case, just write to Wm. Eugene Hays, 501 Boylston Street, Boston, Mass., for information. There's no obligation, of course.

DID YOU EVER PULL THE TRIGGER ON A TEST TUBE?



THE test tube is a mighty weapon in this war. It is the birthplace of strategic materials America must have to win.

But the contents of a test tube mean little until the results of the experiments are put into full-scale production. That takes time—and wars won't wait.

In the vital chemical and petroleum industries today, Badger is helping to cut down the precious time required to turn the findings of the test tube into a completed, working plant.

Badger directs the process all of the way—from the first blueprint to the first blow of the whistle! With its large staffs of engineers, chemists, draftsmen, designers and construction workers, Badger gives the unified, co-ordinated effort that speeds production.

Today, with our nation fighting for its very existence, Badger is serving the petro-chemical industries—building plants and equipment for the manufacture of T.N.T., butadiene, alcohol, aviation gasoline, and many other critical war materials. Tomorrow, when the peace is won, Badger will help convert the miracles of wartime test tubes into a greater service for a greater America.

E. B. Badger
AND SONS COMPANY
BOSTON EST. 1841

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PROCESS ENGINEERS AND CONSTRUCTORS FOR THE PETRO-CHEMICAL INDUSTRIES

EASY DOES IT!

A difficult job being well done —
easy does it! Modern warfare on
seven oceans puts a premium on
efficient, unfailing communications.
National equipment is covering all
seven of them.

NATIONAL COMPANY, INC.
MALDEN, MASS.



"AN URGENT CALL FOR YOU"

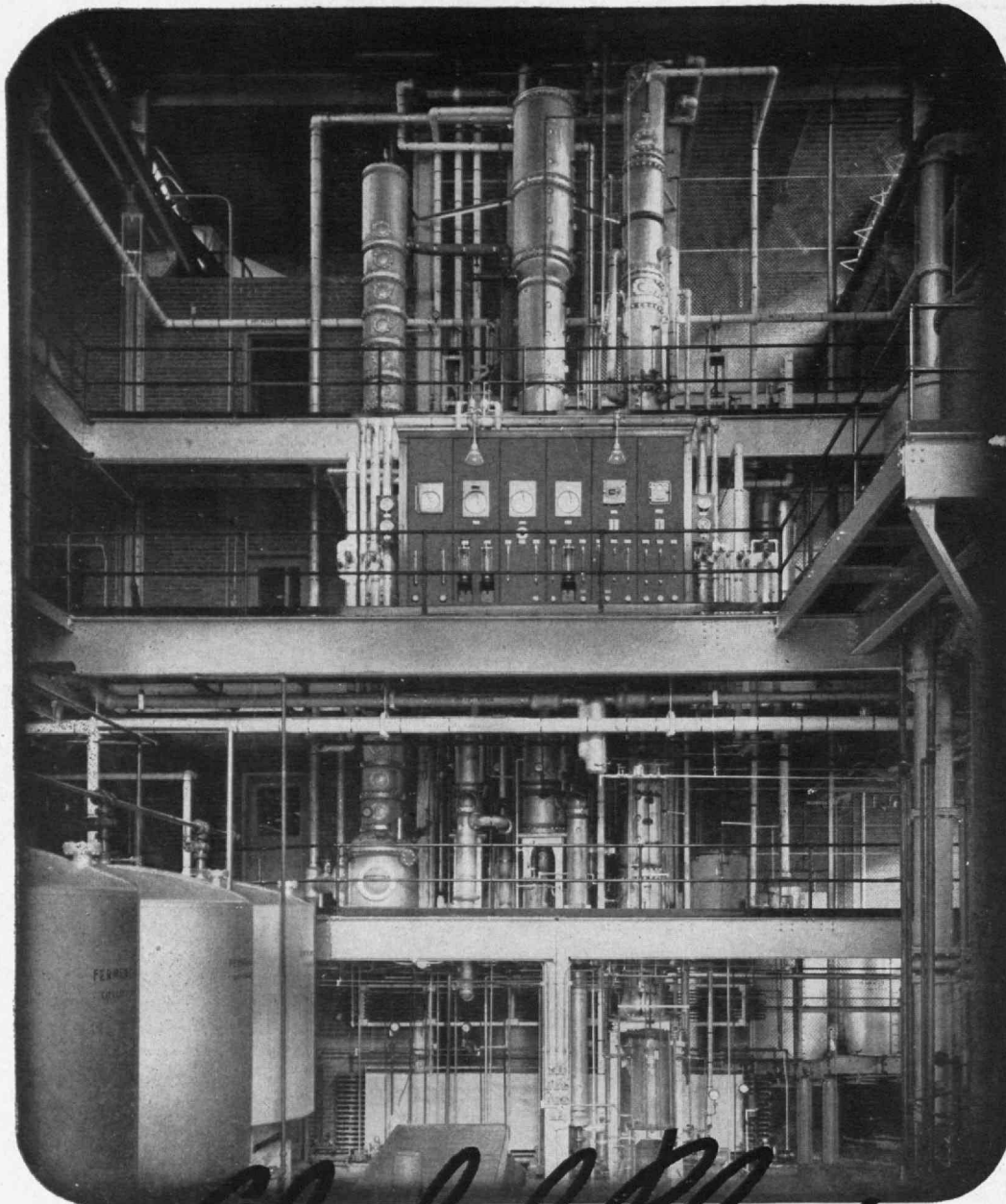
"Please do not make Long Distance telephone calls to war-busy centers unless it is really necessary."

That helps keep the lines open for war messages and war's on the wires these days. When we can get telephone materials again we'll give you all the wires you desire. Many thanks.



BELL TELEPHONE SYSTEM





Alcohol Plants **DESIGNED and BUILT by VULCAN**

Through the use of Vulcan processes embodied in the relatively simple continuous distillation unit illustrated above, refined anhydrous ethanol can be produced from distiller's beer with a steam consumption of less than 20 pounds per gallon; conclusively demonstrating economy of operation heretofore unapproached.

During this critical period, when alcohol production in an unprecedented volume is so essential for the success of the War Effort, Vulcan's comprehensive knowledge of and diversified experience in this field of processing are available to existing distillers and to those who contemplate new production facilities.

DISTILLATION • EVAPORATION • EXTRACTION
PROCESSES and EQUIPMENT

THE VULCAN COPPER & SUPPLY CO., CINCINNATI, O.

PACK *those* VALVES "for KEEPS!"

John Crane EXTRA VALUE
gives many times longer life

All-inclusive assortment of packings for superheated steam, hot and cold water and oils, petroleum distillates, air, gases, acids, chemicals . . . Moulded one-piece rings for shut-off, globe, gate and angle valves, cocks . . . PRICE PACKINGS are "trimmed to the market." When the test comes, they fail. Operation stops; repacking costs become abnormal. It is the costliest method . . . Quality packings, such as "John Crane's," are scientifically fabricated: materials, mechanics and chemistry are fused into an exact unit. You pay somewhat more for it. But stuffing boxes are sealed "for keeps!" It is the money-saving method CONSULT CRANE COUNSEL for recommendations.

CRANE PACKING COMPANY, 1800 Cuyler Avenue, Chicago, Illinois
Branch Offices: Baltimore, Boston, Buffalo, Cleveland, Dallas, Detroit, Houston, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh, St. Louis, San Francisco, Tulsa
CRANE PACKING COMPANY, LTD., Hamilton, Ontario, Canada
Branch Offices: Montreal, Toronto, Vancouver

☆ High pressures . . . Temperatures to 1000°F
VALVES, VALVE RODS, STEMS
on superheated and saturated steam, hot gases
SUPER-SEAL 6AM PLASTIC PACKING

☆ Temperatures to 550°F
VALVES, VALVE RODS, STEMS
general utility on steam, water, air
SUPER-SEAL NO. 1 PLASTIC PACKING

☆ High pressures to 1200 pounds
Temperatures BELOW 550°F
HOT OIL VALVES, (ALSO DIPHENYL)
on hot oil, crude oil, gas oil, pressure distillates
STYLE 100-AL ALUMINUM PACKING

☆ Medium temperatures
VALVES AND STEMS
on hot and cold water and oils, caustic solutions and acids
STYLE 810 SQUARE-BRAIDED ASBESTOS PACKING

☆ VALVES AND STEMS
on gasoline, distillates, solvents
STYLE 1810 BRAIDED ASBESTOS PETROLEUM
RESISTANT PACKING

☆ Medium temperatures
VALVE STEMS
on steam, hot and cold water and oils
SUPER-SEAL VALVE STEM PLASTIC PACKING

☆ Temperatures to 1000°F
for shut-off valves (steel, brass), globe, gate and angle valves, cocks, etc.
Services: Freon, SO₂, NH₄, methyl chloride gases, oil and petroleum distillates, saturated steam, hot and cold water, air. Also foods, edible oils, etc.
STYLE 172-D . . . "JOHN CRANE" ENDLESS RINGS (PLASTIC)

JOHN CRANE *packings*

BUY ANOTHER BOND!





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when Tools are Dependable
 Speed-up precision
 Reduce spoiled work.
 And accelerate the flow of
 War Production

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WAR PRODUCTION

Cambridge Engineers are glad to work with manufacturers having instrument problems. Cambridge has developed innumerable outstanding special-purpose instruments for determination of temperature, moisture and acidity; for continuously analyzing many gases and liquids and for measuring various physical properties of solids.

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Other precision, mechanical and electrical instruments.
 Send for bulletins describing instruments of interest to you.

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THE TABULAR VIEW

Prediction. — The forecast that after this war the automobile will still purr over the highways is not one to elevate an eyebrow. But some of the attributes of that postwar car which WILLIAM B. STOUT foresees (page 125) suggest many a change from the things that are as well as from those that were. Mr. Stout's career as an engineer and designer — his *Batwing* was the first American commercial monoplane; he was a primary figure in the development of the Ford trimotored transport plane; his Stout Engineering Laboratories, revived in 1929, are nowadays busied with transportation research on airplane, railway, and motorcar developments — centers unusual interest in what he has to say concerning the car which John Citizen may drive a few years hence. Chief engineer for the Scripps-Booth organization some 30 years ago, Mr. Stout has known automobiles and airplanes alike during their formative periods.

Comestible. — The last time that famine stalked a weary world as one result of a war forced on the democracies by aggression and ideological buncombe, SAMUEL C. PRESCOTT, '94, then Professor of Industrial Microbiology at the Institute, served as a major in the Sanitary Corps of the United States Army, being in charge of food research and the problems of storage at the Army training camps. Named chief of the division of dehydration of the Bureau of Chemistry in Washington as a consequence of this work, Dr. Prescott pushed progress farther in methods of handling food-stuffs so as to preserve their quality and make them more readily transportable. Now as professor emeritus and honorary lecturer, Dr. Prescott is busying his "retirement" from the post of dean of science, which he held for 10 years following appointment in 1932, by a return to this service. Special consultant to the Quartermaster Corps of the Army, he is at work with his usual energy and enthusiasm in the rapidly expanding development of the manufacture of dehydrated foods both for the armed forces of the nation and for the peoples whom the Allies must rehabilitate. His survey (page 127) of the rebirth, growth, and stabilization of what may prove to be a postwar industry of first importance carries the weight of authority and the vitality of vigorous interest.

Redivivus. — Antiquary of aeronautics as well as active participant in many phases of the research and development contributing so greatly in these days to the advance of aviation, S. PAUL JOHNSTON, '21, is likewise a frequent contributor to *The Review*. From his ranging in the historical byways of the evolution of the airplane, he reports (page 130) the little-known resurrection of the work of an almost forgotten pioneer, telling how an airplane on paper was translated into an airplane in the air, how it flew, proved a theory, and then slipped again out of sight. His chronicle of Alexandre Goupil, Albert F. Zahm, and the resultant *Duck* is an interesting look into the past. (Concluded on page 114)