December 1943

TECHNOLOGY REVIEW

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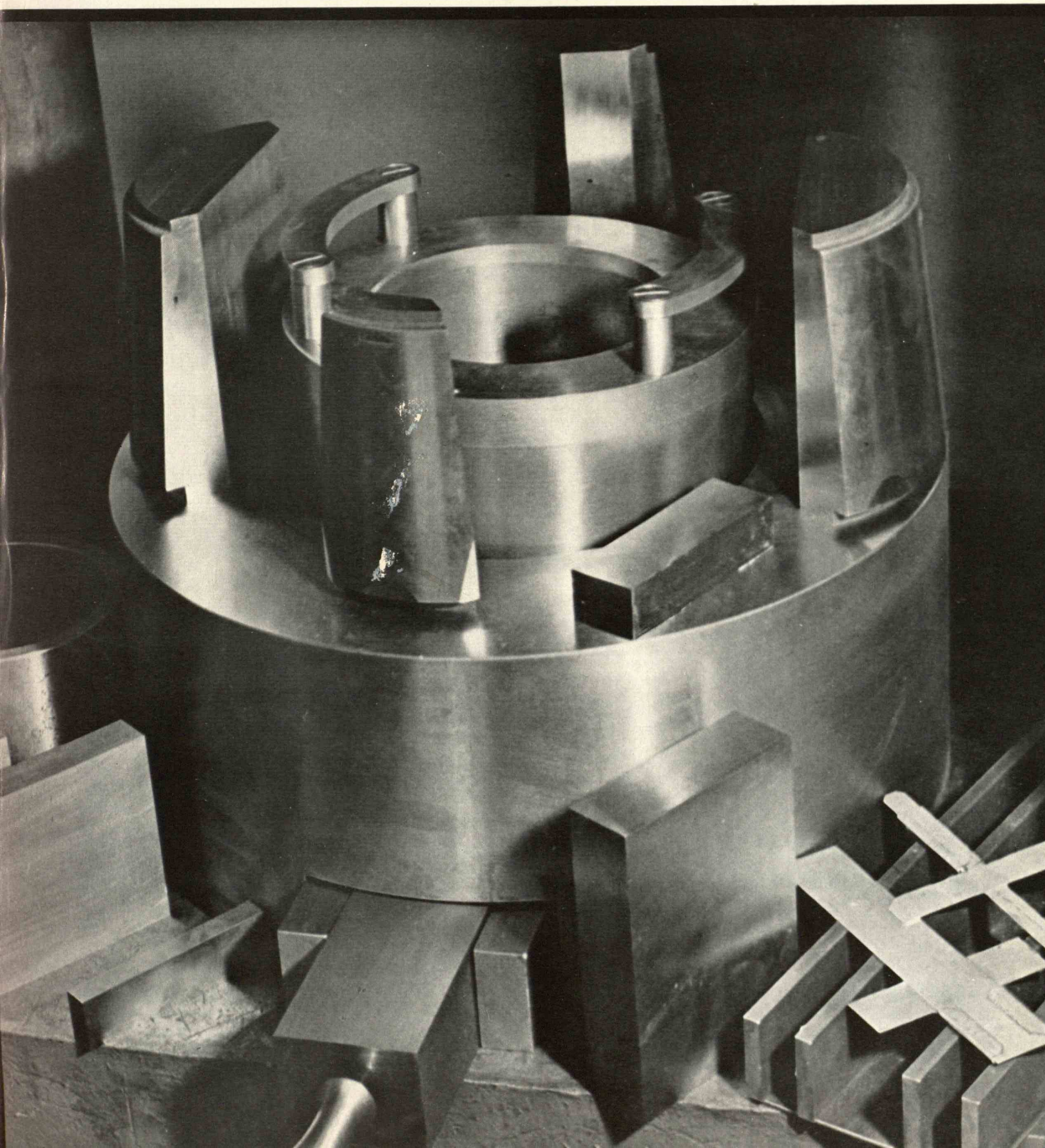
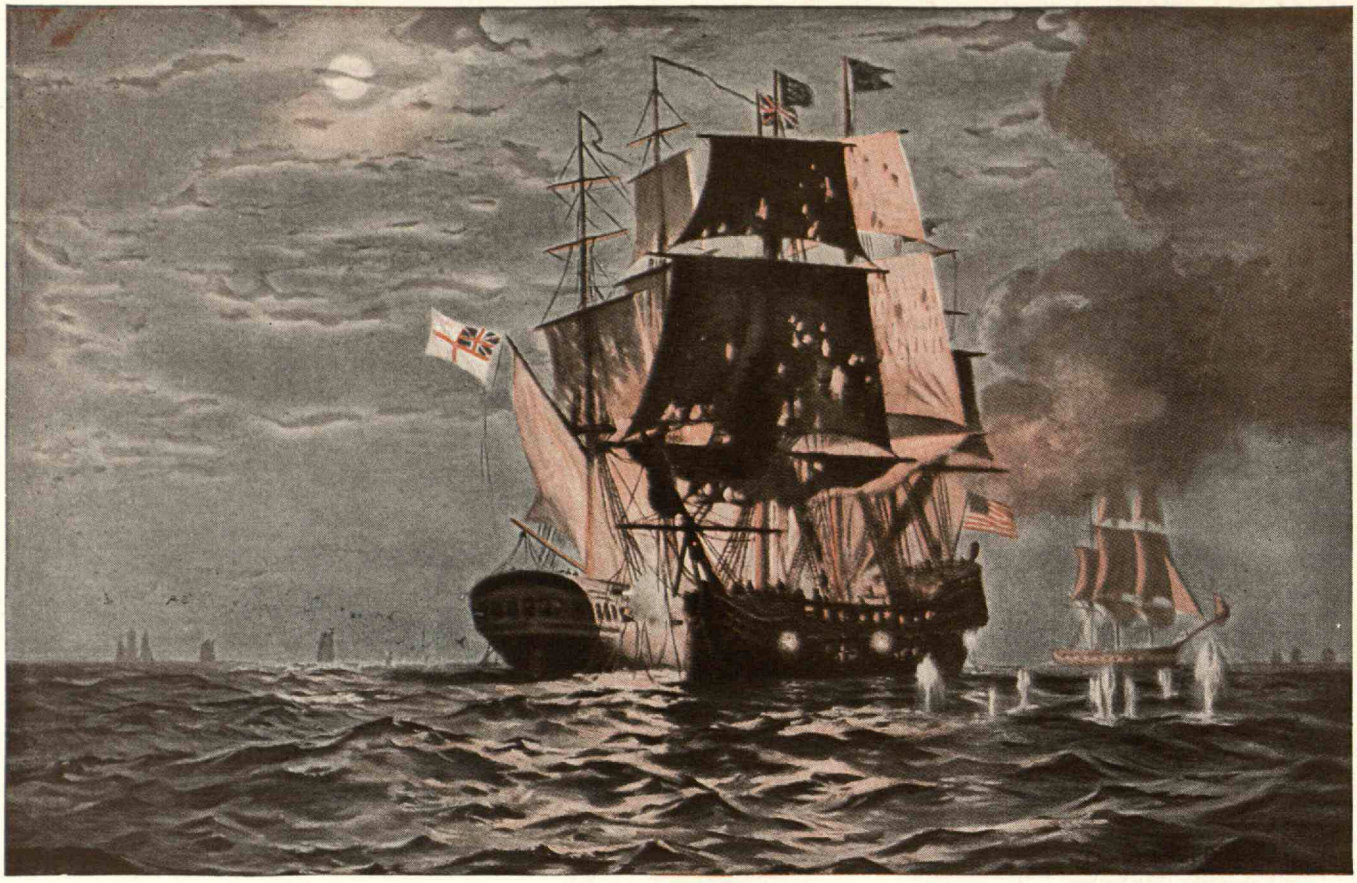




Evening off Flamborough Head . . .

SEPTEMBER 23, 1779

The Bon Homme Richard, her decks a shambles. Raked from bow to stern. Hull blasted to a sieve, filling fast.

Shout from the Serapis' captain, "Have you struck?"

Then from his quarter deck, John Paul Jones lifted himself and his men to immortality with inspired words. Words that welled from an iron heart to set infectious courage leaping like wildfire through his crew. Words that made victory and founded naval tradition for an infant nation.

"No! I have not yet begun to fight!"

Today these words are still vital and inspiring at the work bench, at the bond booth—everywhere that men and women are working or fighting for victory.

PENFLEX responds with augmented effort so that more and more diesel exhausts, fuel oil feed, circulating water and starting air lines may speed the building and operation of the great armada of fighting and cargo ships that has grown from the tradition so brilliantly founded that September day.

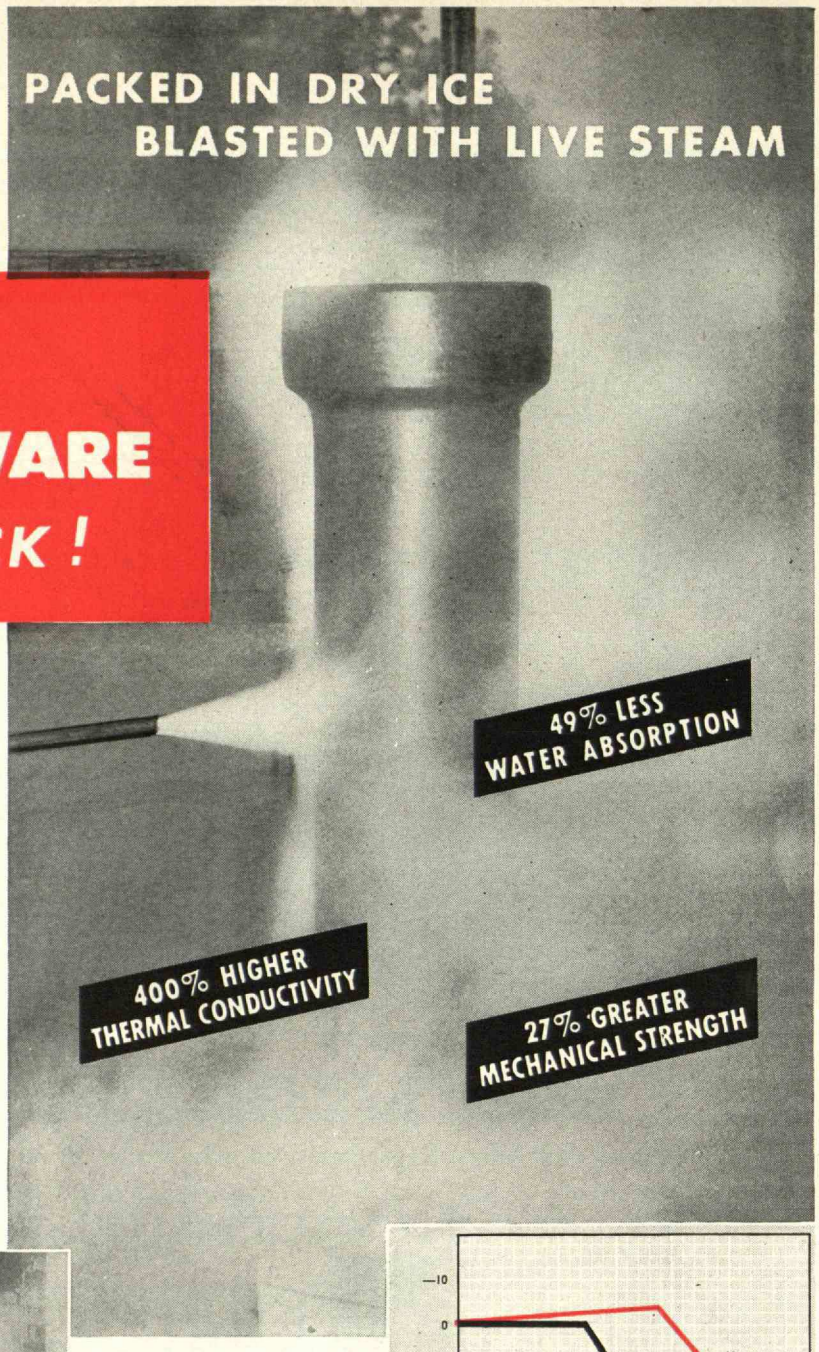
Army and Navy requirements come first. However, if you are doing essential high priority war work and need flexible metallic tubing, write for Bulletins that will show you how PENFLEX can help you.

PENNSYLVANIA FLEXIBLE METALLIC TUBING CO.

PENFLEX METAL HOSE

Established 1902 7250 POWERS LANE • PHILADELPHIA, PA.

THE TECHNOLOGY REVIEW, December, 1943. Vol. XLVI, No. 2. 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.



THIS NEW CHEMICAL STONEWARE REFUSES TO CRACK!

THIS new "Ceratherm 500" will change your whole thinking about chemical stoneware equipment. Here, for the first time in the history of ceramics, is a chemical stoneware body, rugged, like cast iron, of low-porosity and high thermal conductivity, that will withstand abrupt heating and cooling!

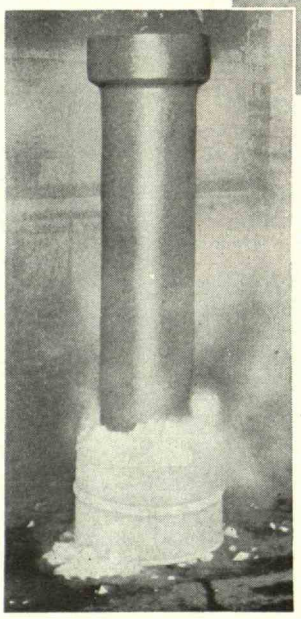
The most persistent claims raised against ordinary chemical stoneware have been its poor resistance to thermal strains and heat shocks, and its fragility. Admittedly tops from the standpoint of corrosion-resistance; admittedly the least expensive material from which equipment of odd size and unusual shape could be fabricated, chemical stoneware would have been specified for hundreds of additional applications if it had been able to withstand rough usage and sharp temperature changes.

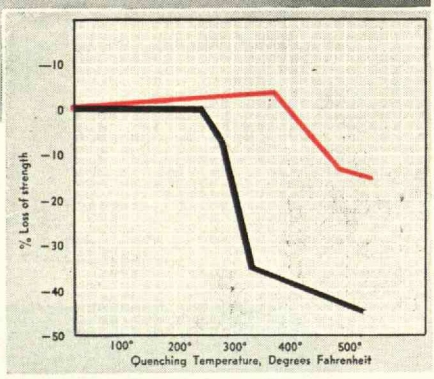
"Ceratherm 500", U. S. Stoneware's new heat-shock resistant body does just that. Temperatures can be raised quickly over a wide range through direct application of steam or hot gases, even, in some cases by direct flame. Slow, cumbersome heating with hot oil or sand baths can be forgotten.

27% STRONGER

"Ceratherm 500's" marked resistance to thermal stresses has been obtained without sacrifice of mechanical strength, corrosion-resistance, or absorption characteristics. In fact, "Ceratherm 500" is initially 27% stronger mechanically (it actually increases in strength with thermal changes — see chart) than standard bodies now available. Its corrosion-resistance has been unaffected. Its thermal conductivity is almost 400% greater than ordinary stoneware. Its porosity, as measured by water absorption tests, is less than half the figure generally accepted as being within the limits of good chemical stoneware.

The cost? But a fraction more than standard bodies. In fact, on most items the cost differential is negligible.





This new "Ceratherm 500" actually shows an increase in mechanical strength (note chart at right) when heated to 400° F. and quenched, more than 100° beyond the point where ordinary chemical stoneware bodies begin to lose strength!

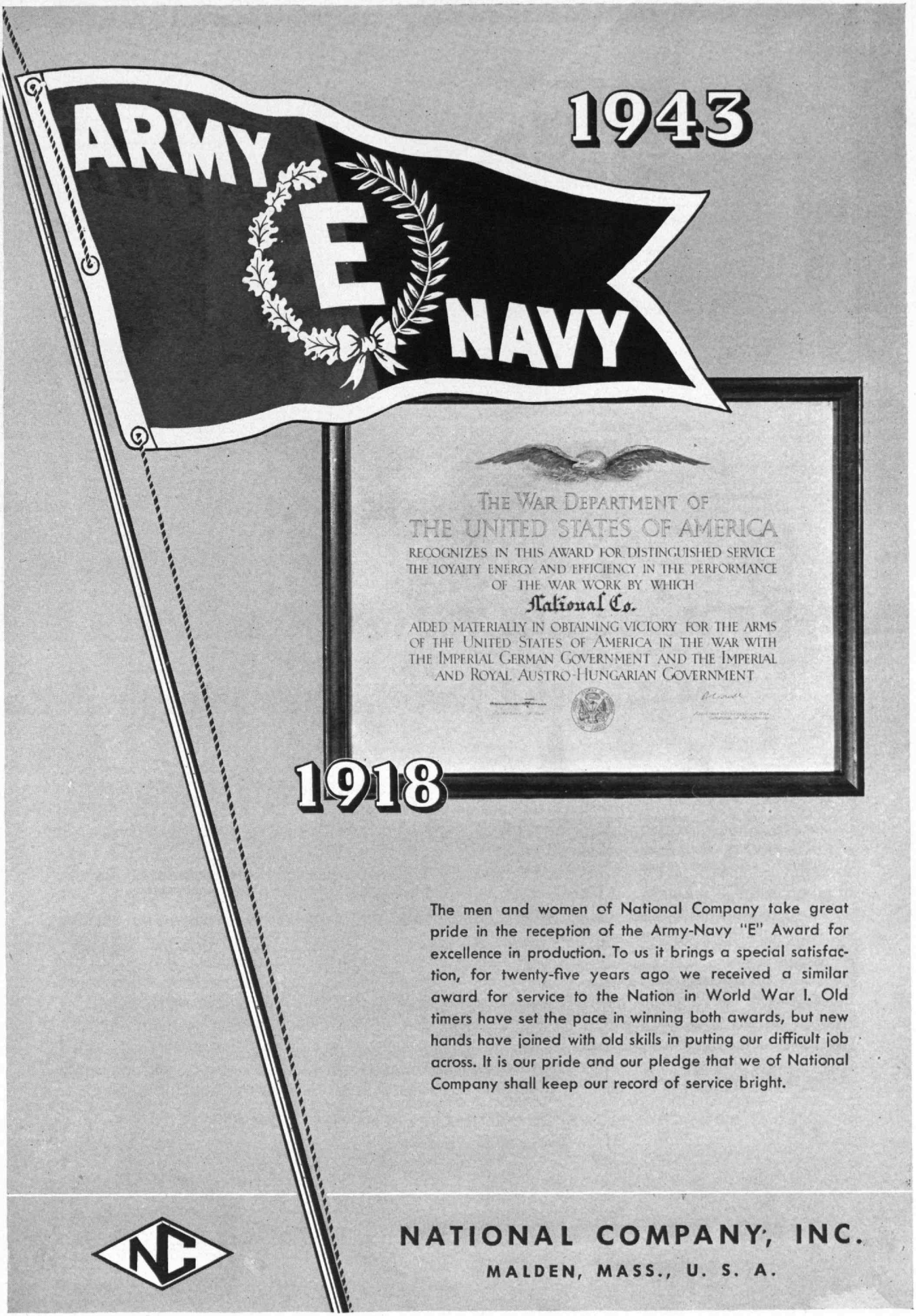
In the photograph above, a chemical stoneware pipe 10″ ID x 5′ x ¾″ wall thickness, made from "Ceratherm 500", was packed in dry ice of a temperature of —109° F. After an hour the pipe, still packed in dry ice, was subjected to repeated and prolonged blasts of super-heated steam of 125 lbs. pressure (equivalent to a temperature in excess of 325° F.). An ordinary chemical stoneware body would have been destroyed at the first turn of the steam valve. "Ceratherm 500" was unaffected.

"Ceratherm 500" is available now. Specify it for full-sized process equipment, such as boiling kettles, evaporating dishes, cooling coils, filters, tanks, mixing equipment, valves, pumps, or for any equipment where ruggedness, high thermal conductivity and heat-shock resistance are required.

U. S. STONEWARE

Since 1865 • Akron, Ohio

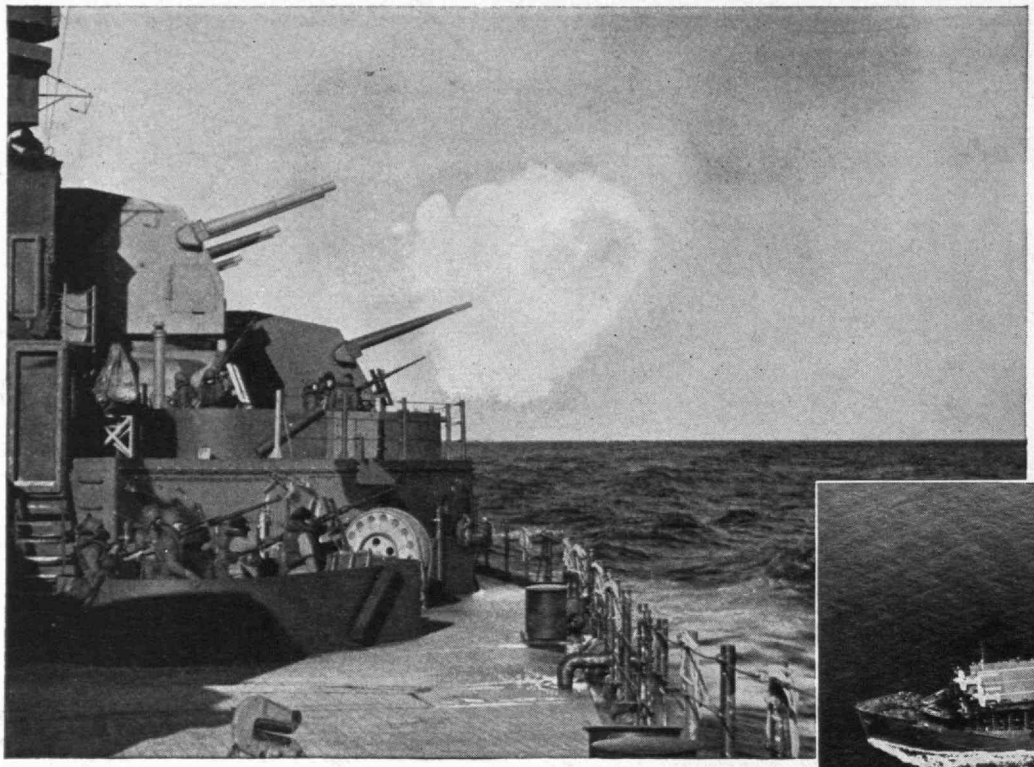
IN CANADA: CHAMBERLAIN ENGINEERING, LTD., MONTREAL



The men and women of National Company take great pride in the reception of the Army-Navy "E" Award for excellence in production. To us it brings a special satisfaction, for twenty-five years ago we received a similar award for service to the Nation in World War I. Old timers have set the pace in winning both awards, but new hands have joined with old skills in putting our difficult job across. It is our pride and our pledge that we of National Company shall keep our record of service bright.

NATIONAL COMPANY, INC.

MALDEN, MASS., U. S. A.



OFFICIAL U. S. NAVY PHOTOGRAPHS

Seeing Pictures Like These Makes the Headaches Worthwhile

As with most other plants, Busch-Sulzer found it no easy matter to throw its peacetime procedure by the board overnight and get into a full stride of war production. The Navy wanted ammunition hoists above all and quickly. Men, machines and tools had to start from scratch. New men had to be trained. Obstacle after obstacle had to be overcome.

Sooner than we hoped for, the ammunition hoists began leaving our plant. The Navy wanted Diesels and got them, too. The Department awarded Busch-Sulzer its E—and then a star, a second star and now a third.

Now, these official U. S. Navy photographs show what the headaches have helped to accomplish. The 'flat top' is the U. S. S. Long Island, an auxiliary aircraft escort vessel of the type that has been much in the news lately. It is powered by Busch-Sulzer Diesels. The other picture shows the 5″/38s of a battleship being fired. These dual-purpose guns are served by ammunition hoists of the type made by Busch-Sulzer. The hoists are made with watch-like precision. Just what they do for the gun is one of those stories that will astonish you after the war.

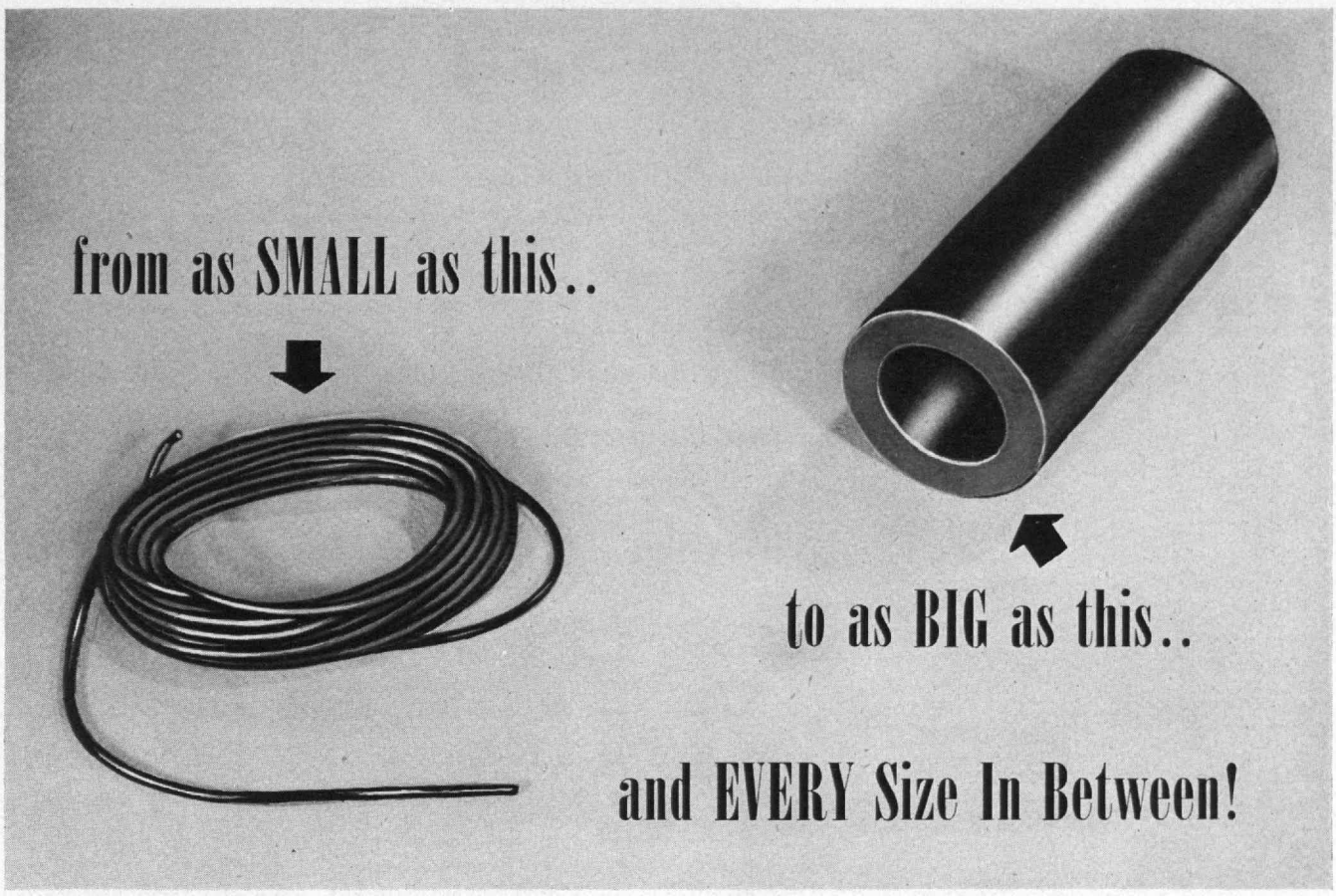
Right now it's good to know that skilled American workmen have done and are doing their share to hasten the hour of victory.

BUSCH-SULZER BROS. DIESEL ENGINE COMPANY

SAINT LOUIS

BUSCH-SULZER ST. LOUIS

AMERICA'S OLDEST BUILDER OF DIESEL ENGINES



Sandee

FLEXIBLE PLASTIC TUBING

Custom-made to every practical size and thickness, the uses for SANDEE Flexible Plastic Tubing are practically unlimited. Investigate this modern product for insulating electrical wire and cable. It's made in all the N.E.M.A. colors. Consider it also for acid drains, oil lines, air hosing, and other such uses. Sandee Plastic Tubing is highly resistant to acids, oils, greases, is non-oxidizing and possesses ample tensile strength. No matter what size, thickness, length, color, or degree of flexibility . . there's a SANDEE *Flexible* Plastic Tubing to meet practically every need. Let our skilled plastic engineers help you on production problems. Send for samples and complete information, today.
★ Sandee also manufactures a large line of stock and custom-made extruded *rigid* plastic sections. Complete information on request.

ELMER SZANTAY, M.E. '35, GENERAL MANAGER

Sandee Manufacturing Company

3945 NORTH WESTERN AVENUE • CHICAGO, ILLINOIS

EXTRUDED PLASTICS AND SPECIAL TOOLS

"PUT IT ON THE BLANCHARD"

CHECK THESE ADVANTAGES OF BLANCHARD GRINDING

- Production
- ★ Adaptability
- Fixture Saving
- Operation Saving
- Material Saving
- Fine Finish
- ★ Flatness
- ★ Close Limits

★ . . . . . *Especially valuable on jobs like the one illustrated.*

HERE are two surface grinding problems that came to the Blanchard Engineering Department in one week:

(1) Grind a hardened steel ring 86½" in diameter to a tolerance of ±.0002" for thickness.

(2) Grind the edges of a steel strip, .005" thick, .125" wide, and 20" long, straight and to a tolerance of ±.0005".

Thirty years' experience in grinding flat surfaces enabled Blanchard Engineers to solve the grinding of both of these jobs, using Blanchard vertical Surface Grinders and Blanchard Grinding Wheels.

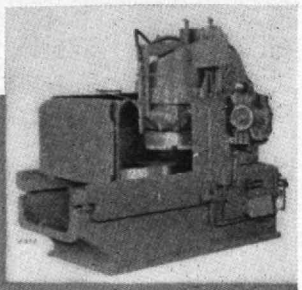
If you have work which lies within the range here indicated, you should investigate the possibilities of a Blanchard.

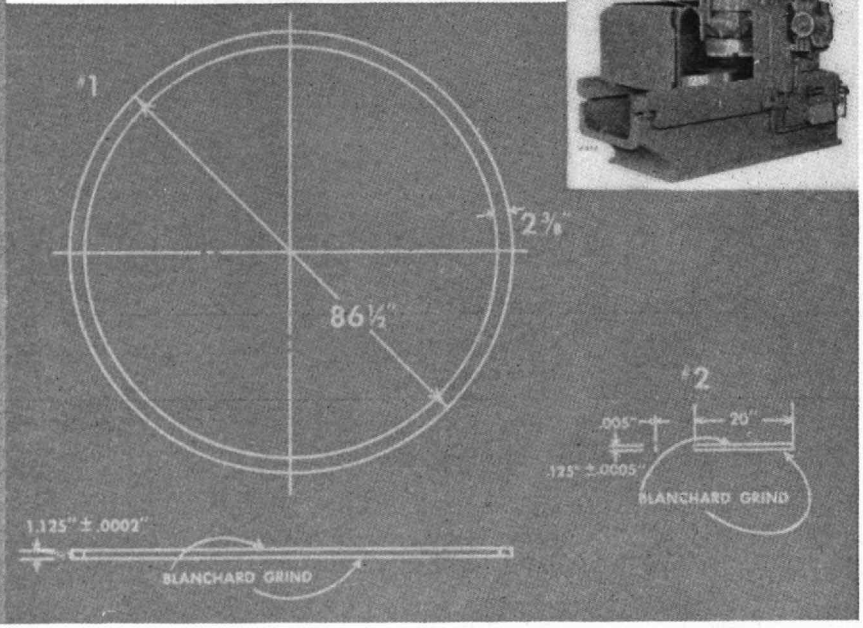
Whether the job is large or small, usual or unusual, Blanchard can show you how to grind it better and faster.

The BLANCHARD MACHINE COMPANY

64 STATE STREET, CAMBRIDGE, MASS.

Grinding Hardened Steel Rings and Edges of Steel Strip on Blanchard Surface Grinders.





BLANCHARD

Send for your free copy of "Work Done on the Blanchard." This book shows over 100 actual jobs where the Blanchard Principle is earning profits for Blanchard owners.

The Spark that Lights the Flame of Victory

A pinpoint of fighting metal placed in the arc of the spectrograph writes its own signature on a photographic plate. Inside the instrument, the light from that flame is broken up by a prism as a prism breaks up sunlight. Each element identifies itself by a series of characteristic lines, always the same for the same basic element. It reveals to the spectrographer each constituent, what impurities are present and in what quantities.

Thus spectrography helps in controlling inspection. It keeps tough fighting steels tough, helps in development of new fighting metals. Spectrography is used too in other fields . . . chemicals, foodstuffs, vitamins. It speeds research, control, and analysis. Today, spectrography is helping to build the tools of Victory as in peacetime it helps to make better cars and better breakfast foods.

Because Bausch & Lomb had long experience with such precision optical equipment needed in education, research, and industry, it was ready for quantity production of precision optical instruments of war such as gunfire control instruments, binoculars, and aerial photographic lenses. When the last gun is fired, Bausch & Lomb will devote its enlarged experience to peacetime optical production. Through war and peace, Bausch & Lomb has continued . . . and will continue . . . to do the job it knows how to do best. *Here again optical science is seeing it through.*

For Bausch & Lomb Instruments essential to Victory—priorities govern delivery schedules.

BAUSCH & LOMB

OPTICAL CO. • ROCHESTER, N. Y.

ESTABLISHED 1853

AN AMERICAN SCIENTIFIC INSTITUTION PRODUCING OPTICAL GLASS AND INSTRUMENTS FOR MILITARY USE. EDUCATION. RESEARCH, INDUSTRY AND EYESIGHT CORRECTION

THE TABULAR VIEW

Twoscore. — It lacked eight days of Christmas in 1903 when Orville Wright started a telegram on the way to his father, reporting a world-shaking event in characteristically unpretentious style: "Success four flights Thursday morning all against twenty-one-mile wind started from level with engine power alone average speed through air thirty-one miles longest 59 seconds inform press home Christmas." This month, 40 years after that windy Thursday on the dunes of Kitty Hawk, The Review presents (page 83) an evaluation of what Orville and Wilbur Wright had to do to bring to pass man's most ancient desire. FRED C. KELLY, one of the members of the press who then paid little heed to the announcement in that telegram, has in the years since worked closely with Dr. Wright on the history of the achievement of 1903. Mr. Kelly's biography, *The Wright Brothers*, authorized by Orville Wright, appeared last spring. His essay in this Review is marked by the trenchant style which makes him a notable companion in contemporary letters. A pictorial footnote of especial interest to Technology people appears on page 93 — a photograph recalling Dr. Wright's attendance at the dedication of the Institute's Cambridge home in 1916, when the *Wright Flyer* was exhibited.

Team. — How science, industry, and American military men have worked together for the winning of this war is implicit in all parts of the record of recent years. For The Review, BRIGADIER GENERAL ALDEN H. WAITT, assistant chief for field operations, Chemical Warfare Service, brings an area of that record into sharp focus in an article (page 85) describing the development of a new smoke generator which has proved of great value in the screening of important targets against air attack. An Alumnus of the Institute, Class of 1914, General Waitt is one of the few original World War chemical warfare officers remaining in our Regular Army. He is a frequent contributor to magazines and is the author of *Gas Warfare*, accepted as the standard book in the field.

Futures. — It is appropriate that in the anniversary month of the Wrights' success, consideration should be given to our future use of the vast fleets of transport aircraft now in operation for military purposes. L. WELCH POGUE, chairman of the Civil Aeronautics Board, argues cogently (page 88) the necessity for sound planning to meet this problem of the postwar years. An able and farseeing administrator, Mr. Pogue is a graduate of the University of Nebraska; he served as general counsel for the Civil Aeronautics Board before assuming his present post.

Plant Plans. — Trends in the construction of industrial buildings, now possibly of academic interest except in so far as large-scale war plants are concerned, will be of major concern to American communities in years to come. They are discussed (page 90) by HERBERT S. SWAN, city planner and industrial consultant, who frequently comments on social phenomena for The Review. Projects for urban rehabilitation which are counted on as assistance in restoring peacetime equilibrium of employment cannot but be influenced by the developments which his article discusses.

Hot. — Application of electronic principles to the bonding of plywood is an industrial development of decided importance. THOMAS D. PERRY, who explains (page 80) the technique and its advantages, was graduated from the Institute in 1900, and is sales and development engineer for the Resinous Products and Chemical Company. For some 30 years he has been associated with the development of plywood by American industry and is the author of an authoritative volume on the subject.