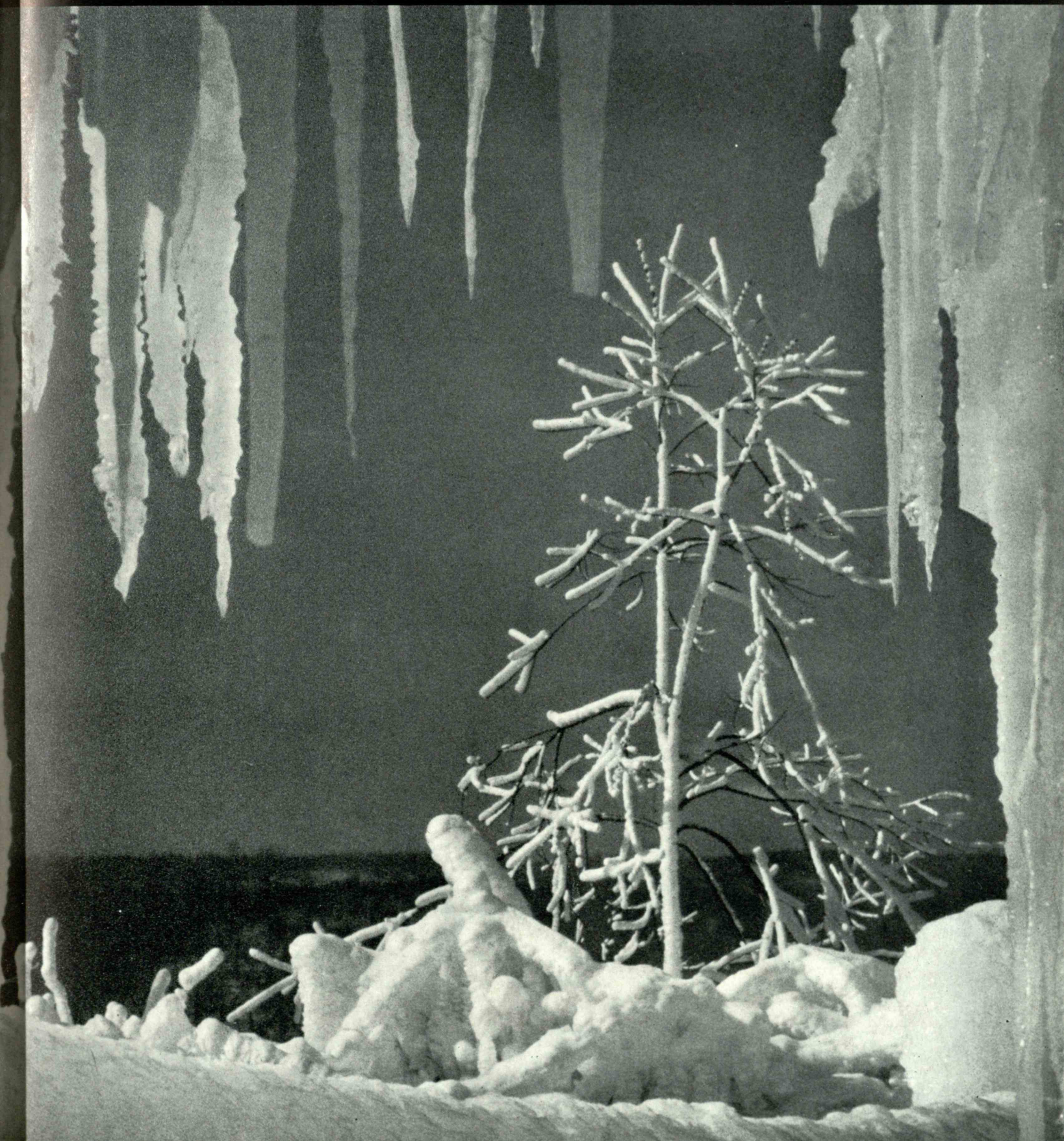


*January* 1941

# TECHNOLOGY REVIEW

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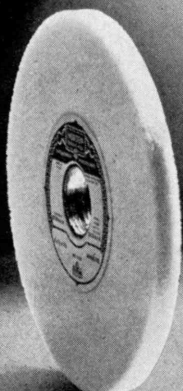




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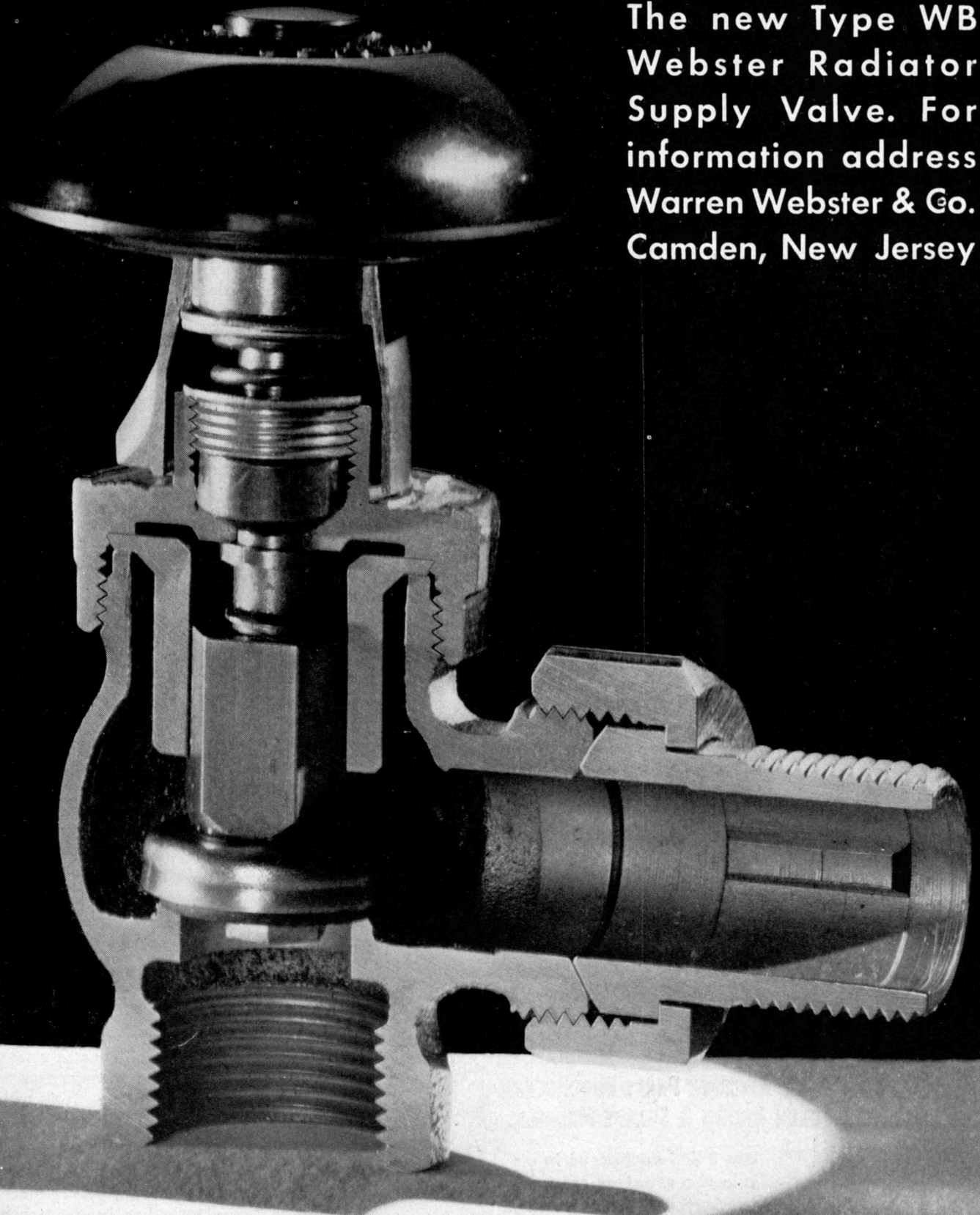
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**MAIL RETURNS**

*Letters Requested*

FROM WILLIAM C. DICKINSON, '70:

I have received your November issue, and it certainly is a dandy. You are to be heartily congratulated for the very fine work shown in this publication. From some experience I know it is a big job to edit and have printed such an extensive book as you have produced in the best of style. I notice that you refer to Professor Richards of the first Institute Class—1868—who must be a man of quite advanced years. . . . For myself, of the Class of 1870, I was ninety-one on September 20 and at present can recall the names of Archer, Orvis, Cross, Mason, Turner, Whitney, and Herreshoff. I should be glad to hear from any of my Class who are still alive. My address is 5929 Cates Avenue, St. Louis, Mo.

I am the author and publisher of the enclosed two booklets [dealing with religious and philosophical subjects], and I have already supplied the Technology Christian Association with some hundred copies of each. . . . I am very much interested in everything connected with the Institute and always attend our Technology Club dinners. I wish you all success with your fine publication and expect to continue to support it.

St. Louis, Mo.

*Clad, Not Plated*

FROM CLAYTON D. GROVER, '22:

. . . I was a little disturbed at the mention of the nickel-plated holds in the fishing trawlers described in Richard Hallet's article, "Net Returns from the Banks," in the December Review. Actually, the proper description is nickel-clad holds. Nickel plate connotes the product with which we are familiar on electrical fixtures, and so on, whereas the material used in the holds of the trawlers is quite a different one. It is a composite heavy sheet or plate composed of steel with a layer of rolled pure nickel on one or both surfaces, the nickel layer being upwards of 1/32-inch thick. The product is made by the Lukens Steel Company by forge welding a slab of pure nickel to a slab of steel and then rolling it out to the desired thickness. The forge welding is accomplished at the rolling temperature by the initial pass of the composite slab through the roll. The material is fabricated and welded by a technique similar to that used for other materials. In other words, the term "nickel plated" conveys an idea of flimsiness, whereas the nickel-clad material is strong and husky.

New York, N. Y.

*A Suggestion*

FROM DONALD McC. STURZNICKLE, '28:

A statement in Alvar Aalto's article, "The Humanizing of Architecture," in the November Review impels me to make a suggestion. The statement (on page 36) is: "Bright reflection from book pages is one of the most fatiguing phenomena in reading." The suggestion is: Please plan to use a less glossy paper for The Review, even at some sacrifice in photographic clarity.

White Plains, N. Y.



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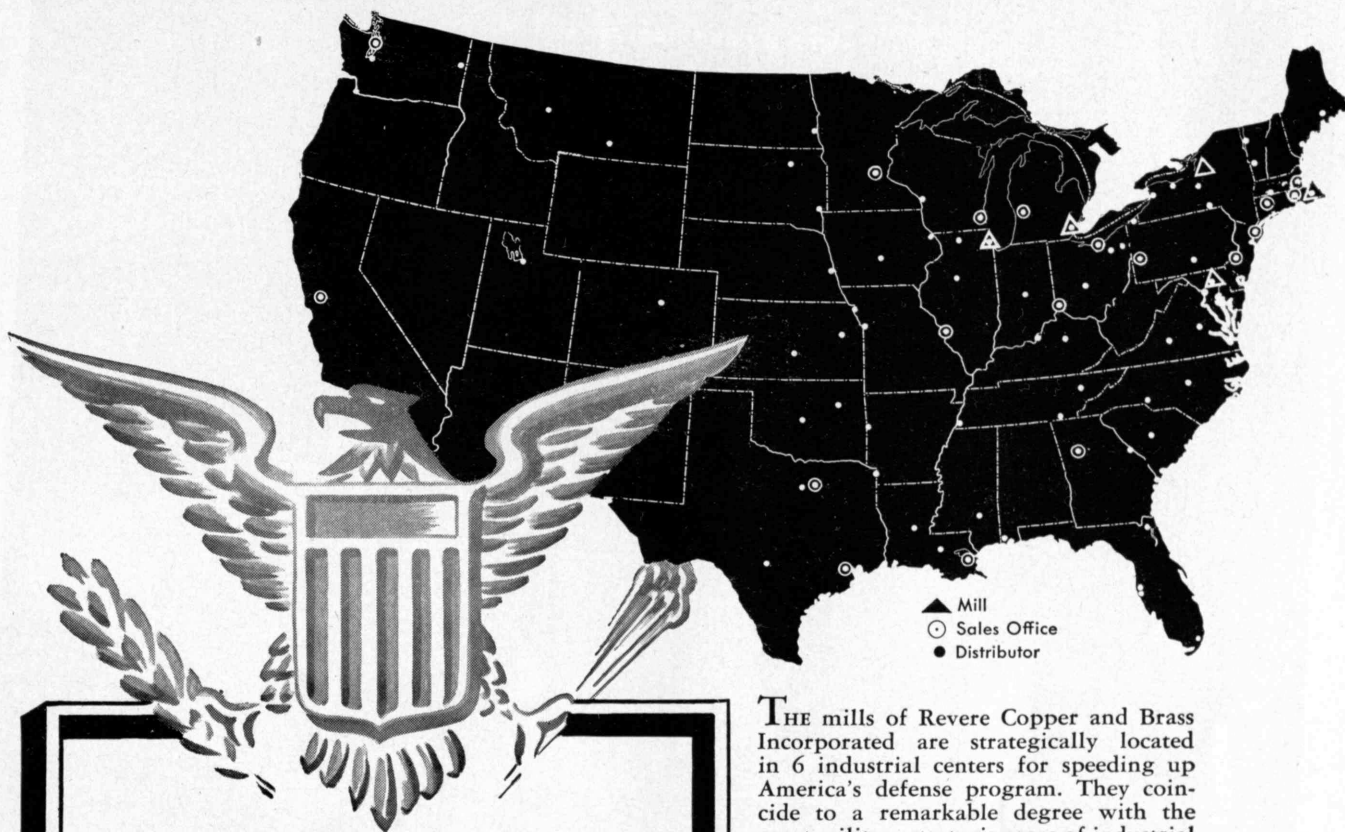
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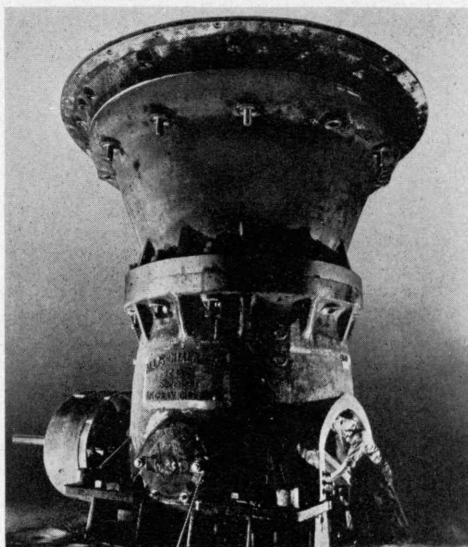
*Here you see how a bottleneck in a large zinc mine was broken, through an ingenious application of rubber by the G. T. M.—Goodyear Technical Man. Dump cars that wouldn't dump were the trouble. Wet, soggy ore was the reason. Ore stuck so tenaciously inside the cars, particularly in the lower back corner, that a third or more of every load had to be laboriously scraped out by hand—a slow costly operation. Since wet ore does not adhere to rubber, the G. T. M.'s answer to this sticker was to line the back of the cars with an apron of tough, smooth*

*Goodyear Armadillo rubber-sheeting, firmly clamped at the top, free to swing at the bottom. Now, when a car dumps, the rubber apron swings forward, sweeping the ore before it and emptying the load in a jiffy. This installation is typical of scores of new uses of rubber developed by the G. T. M. to expedite the handling of all types of materials from zinc to acids. To consult him on your problem, write Goodyear, Akron, Ohio, or Los Angeles,*

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VOLUME 43

NUMBER 3

# THE TECHNOLOGY REVIEW

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EDITED

AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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From a photograph by Charles S. Martz

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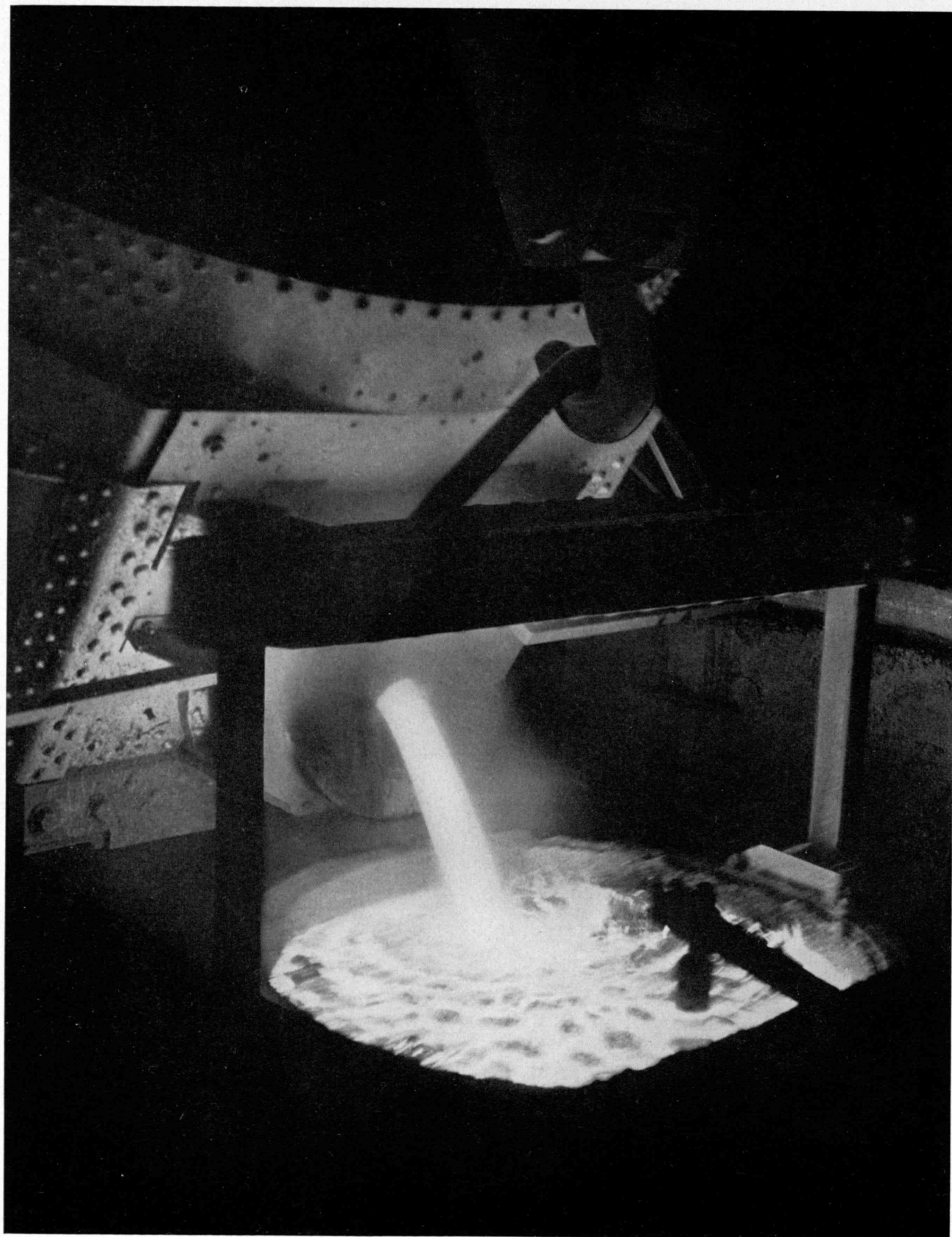
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# THE TECHNOLOGY REVIEW

Vol. 43, No. 3



January, 1941

## The Trend of Affairs

### *Refrigeration Up to Date*

ONLY a few years ago, milk was poured into shallow pans to cool on the hard, damp earth in farmhouse cellars. Butter was packed in dun glazed crocks and gently lowered into the cold water of the spring. Vegetables were buried in root cellars, and housewives fretted over hot stoves canning beets and beans and fruit. Meats were smoked, pickled in barrels of brine, or boiled and sealed in jars against the unreasoning demands of winter appetites. Even after the ponds gave up their ice when the household refrigerator came into general use, diets — particularly in the country — were limited, and the question, winter or summer, was, "Will the food keep?"

The milk pan has disappeared from the cellar floor, and fewer mice now die by drowning; the spring in the meadow no longer serves as a refrigerator; and vegetables are free of the musty flavor of the root house. Beans and beets and fruit are still being canned, but fresh vegetables are available to those who desire them. Even cider, the enjoyment of which was once the most exciting of rural adventures, is protected against fermentation, but refrigeration cannot be blamed for that.

Commercial cold storage, domestic mechanical refrigeration, and quick freezing have answered for all time the question, "Will it keep?" Seasonal restrictions on foods have largely been removed, and well-balanced diets are now available throughout the year.

Like many other advances in science and engineering, improvement in the storage and preservation of food has been taken for granted. Now, however, the increasing fury of the most destructive war in history focuses attention on the enormous importance of refrigeration and its biological significance, for when blockades close normal channels of trade, protection of accumulated food stores is vital to every nation.

The extent to which the peoples of the world are dependent upon refrigeration for preservation of their food materials is shown in a report just issued by the committee on biology of the American Society of Refrigerating Engineers. Bernard E. Proctor, '23, Associate Professor of Food Technology at the Institute, is chairman of the committee, whose other members include Gerald A. Fitzgerald, '23, and Milton E. Parker, '23. The report, "Recent Advances in Refrigeration Biology," brings news of the problems of food protection in England and on the Continent under war conditions and reveals not only that people are issued gas masks but that cold-storage food warehouses are equipped with air-conditioning scrubbers to remove the poison gases of war from incoming air.

In England gas-tight steel chambers for refrigerated storage of eggs in carbon dioxide have been provided to assure safekeeping of this important food. War has also brought into use in England a refrigeration apparatus specially devised to store human blood for emergency purposes at temperatures between 34 and 38 degrees Fahrenheit. The secret of the success of the apparatus is said to be the prevention of even the slightest amount of shaking, thus allowing undercooling of the proteinaceous bodies without denaturation.

In this country numerous reports have appeared in medical literature on the use of refrigeration in the treatment of diseases. The best that can be said at present is that refrigeration has been shown to be helpful in relieving pain; any other benefits in low-temperature therapy are yet to be demonstrated. The use of air conditioning in hospitals, however, has improved the comfort of patients.

Refrigeration has been a boon to the florist for many years. Before the present war one of the largest uses of carbon-dioxide ice in Holland was to lower the temperature of flowers shipped by airplane to the big cities of

Europe. Gladiolus blooms have recently been quick frozen and stored in this country. What the development may mean to floriculture depends on how many other flowers are capable of similar treatment.

Food poisoning caused by staphylococci has been much more common in recent years. Although no relation has been indicated between this disease and frozen foods, it is of interest that Canadian scientists have demonstrated that staphylococcal poisoning cannot come from frozen foods which are thawed and kept below 50 degrees Fahrenheit before cooking.

Ice containing small amounts of nitrites has recently been advocated by Canadian authorities for use in the fishing industry and has been cited as beneficial for the packing of cod and salmon. The ice is not applicable to halibut because of a resulting discoloration. Investigations relating to the possible use of hydrogen peroxide in ice are now being carried on in this country.

The recent discovery that ground peanuts release their oil content much more readily if subjected to freezing may lead to elimination of the use of heat treatment in producing virgin oil.

The value of carbon dioxide as an adjunct to the refrigeration of fruits in storage and in transit becomes more and more evident. Carbon dioxide has proved particularly helpful in extending the storage life of peaches, plums, cherries, and pears in long-distance shipments. Precooling of fruits and vegetables is definitely on the increase, and hydrocooling for such products as celery and broccoli has become more widely appreciated as a conservation measure before long shipments are started. The need for treatment as soon as possible after harvesting is also better realized. A few hours at that time may be the equivalent of as many days in the total storage life of the product.

Sulphur-dioxide fumigation of grapes before refrigerated shipment or storage has proved beneficial in lowering the incidence of molds and rots but does not appear applicable to other fruits unless a different gas is used, since sulphur dioxide injures many fruits.

Various kinds of nuts are refrigerated to prevent insect infestation. Pecans have been found to be particularly sensitive to ammonia, as low a concentration as .01 per cent causing discoloration. Almonds are less susceptible, and walnuts are affected comparatively little.

To destroy the cigarette weevil, which frequently infests tobacco, refrigeration has been found very useful. Restricted exportation of tobacco during the past year has caused the refrigerated storage of it to increase tremendously, as no damage by weevils will occur at the lower temperatures.

According to estimates, about 600,000,000 pounds of frozen foods were produced in 1940, with some 3,200 cold-storage locker plants handling 250,000,000 pounds of products from the farms of our country. Farm freezers are being purchased in considerable numbers, especially in areas where public refrigeration is lacking. These trends seem to indicate that refrigeration is now



*Presse-Photo from Black Star*

*Order — finished gears being readied for assembly*

appreciated to an extent which a decade ago would scarcely have been believed. The health of rural populations, for whom well-balanced diets have been rare in the winter, will be vastly improved by facilities which enable them to enjoy their own meats and vegetables during off seasons.

The proper control of the vast stores of frozen foods is a matter of great importance from both the standpoint of health and that of economics. If proper temperatures are maintained and the foods are of good quality before being frozen, no difficulties are likely from a health standpoint. Microbiological tests, by helping to determine the quality of food, perform a useful role although they are not the sole index of quality. Vitamin content, which is also a factor in quality, has an important role in the health-promoting qualities of foods and is becoming another yardstick useful in evaluating the care with which certain foods have been handled previous to being frozen.

The proper protection of foods in storage has become so important that new packaging materials, containers, and packaging methods have been evolved to combat dehydration and the resulting deterioration in appearance and flavors which may occur simultaneously. To be of the greatest protection against dehydration, packaging must be secure against moisture vapor and capable of an absolutely tight seal.

Certain changes in the form in which foods are offered to the public have also appeared. Eviscerated poultry and cut poultry will soon be the rule rather than the exception. Frozen eggs have practically replaced shell eggs for commercial uses. Frozen cream, deaerated before being frozen, is common, and frozen sweet-cream butter is one very satisfactory means of storing fat.

Refrigeration in America is helping in the solution of many problems of food preservation, and its potentialities for maintaining the health standards of the people in case of a national emergency constitute one of the most reassuring prospects of preparedness in the Western Hemisphere.