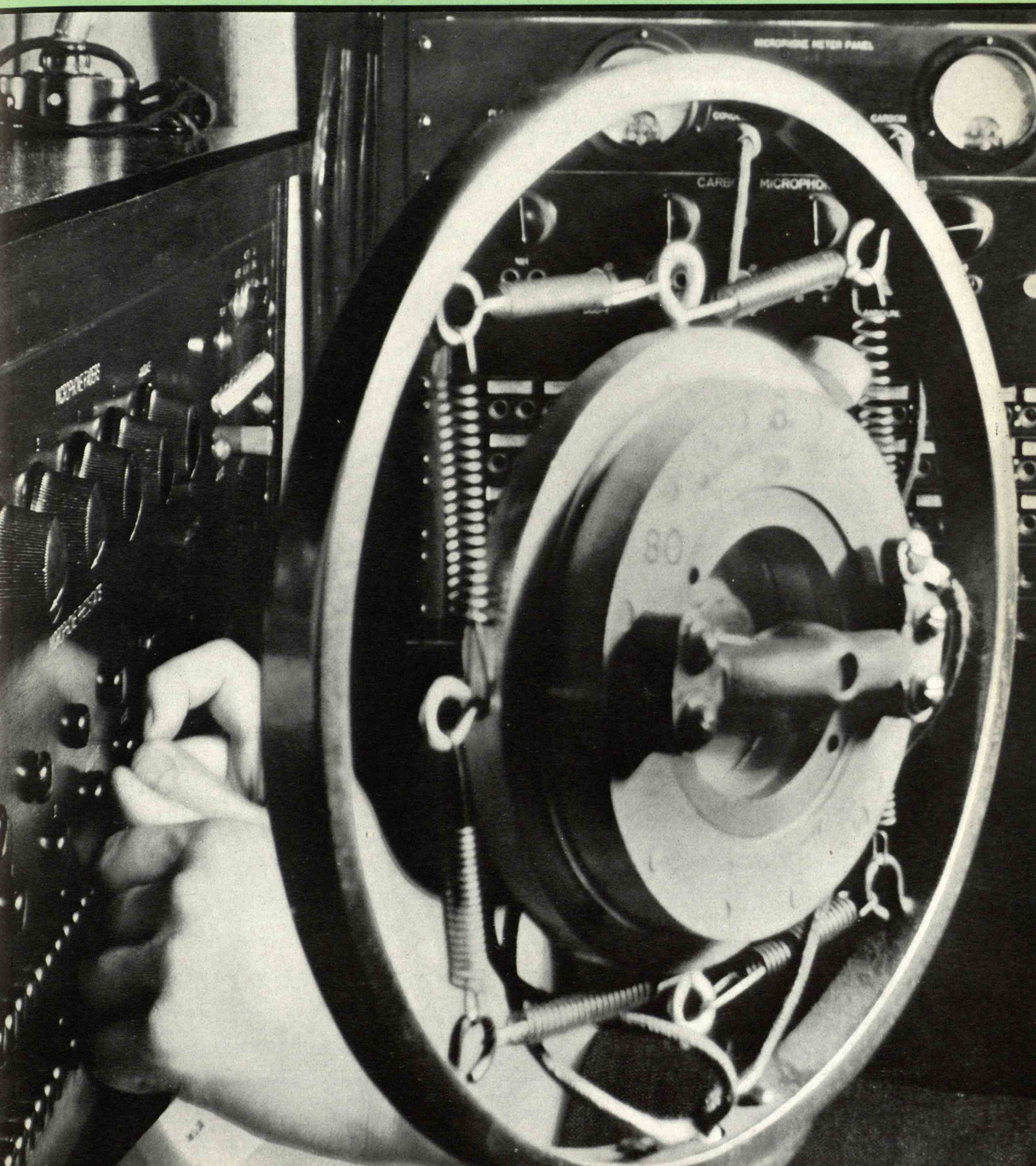
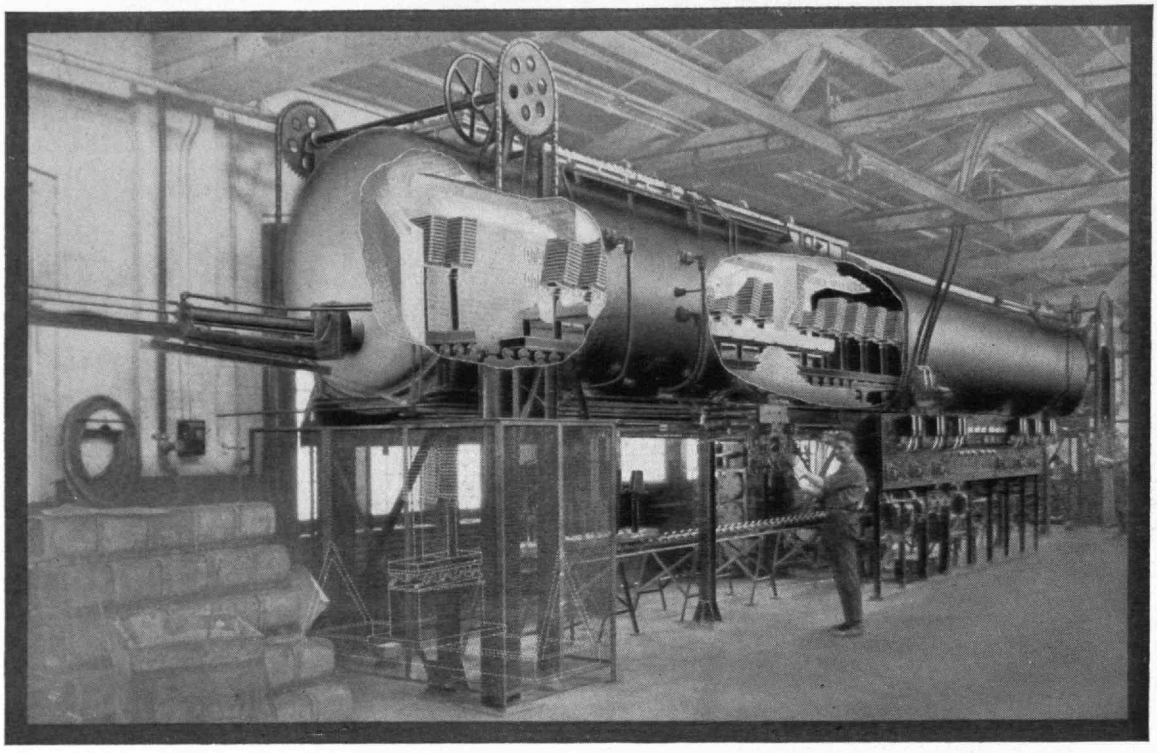
March 1932

TECHNOLOGY REVIEW





SEALING STEEL

WITH FLUID COPPER

WITH copper melted to the consistency of kerosene in an electric furnace, steel can be sealed so as to be gas-tight. Like bones, the grains of steel tend to grow together slowly, but electric heat speeds up the process so that steel joints require but a few minutes to knit. And steel joints knit in a copper-brazing furnace are exceptionally neat, strong, and tight.

As a controlled atmosphere at very high temperature must be used, the electric furnace is important to the process. At brazing temperature, the molten copper wets the clean steel and flows into the finest crevices, forming a copper-steel alloy which seals the joint. The greater the pressure at the joint, the readier the flow of copper.

Such furnaces are used in the manufacture of G-E refrigerators, where hundreds of evaporators are hermetically sealed daily.

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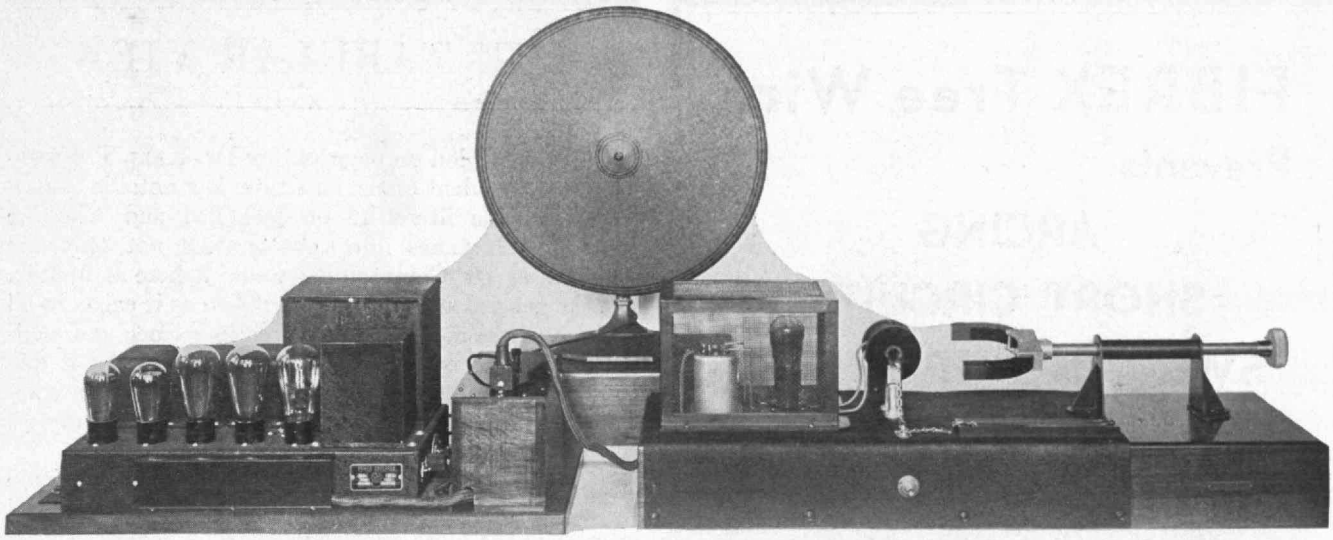
GENERAL ELECTRIC

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

THE TECHNOLOGY REVIEW, March, 1932. Vol. XXXIV, No. 6. Published monthly from October to May Inclusive and in July 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.

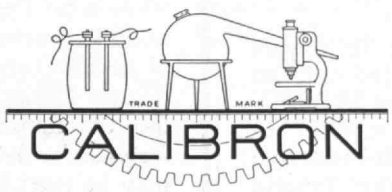


Permitting the public to hear the squirming of molecules! This "Barkhausen Effect" Model is one of a series made for the New York Museum of Science and Industry. It gives experimental support to one theory of magnetism. As displayed, the amplifier at the left of the picture is mounted behind the scenes. Two other models of this series are shown below

TECHNICAL MODELS
OF DISTINCTION

WHATEVER your business may be, you can use models to advantage. At one time you may desire to test out a process in a small way before making a large investment; at another, you may want a striking exhibit for a trade show. Frequently models prove to be of great value in connection with litigation, and their educational worth is generally recognized.

THE New York Museum of Science and Industry, 220 East 42nd Street, New York City, is opening a new section dealing with magnetic and electrical phenomena. We urge you to visit this exhibition — (which contains more than 20 of our working models) — as we are confident it will prove interesting to you.



PERHAPS you have signed for space in the coming World's Fair in Chicago, or possibly you would like a new series of effective window displays. We shall welcome an opportunity to assist you with your problems, — regardless of their nature. This statement is made with very few reservations, for we are well equipped to handle almost any kind of work involving research in Applied Physics.

Demonstrating the square law of heat produced by an electric current

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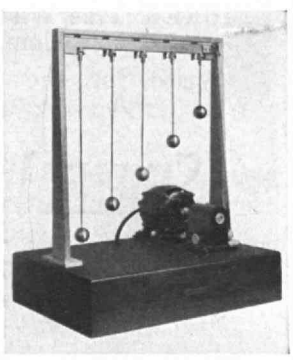


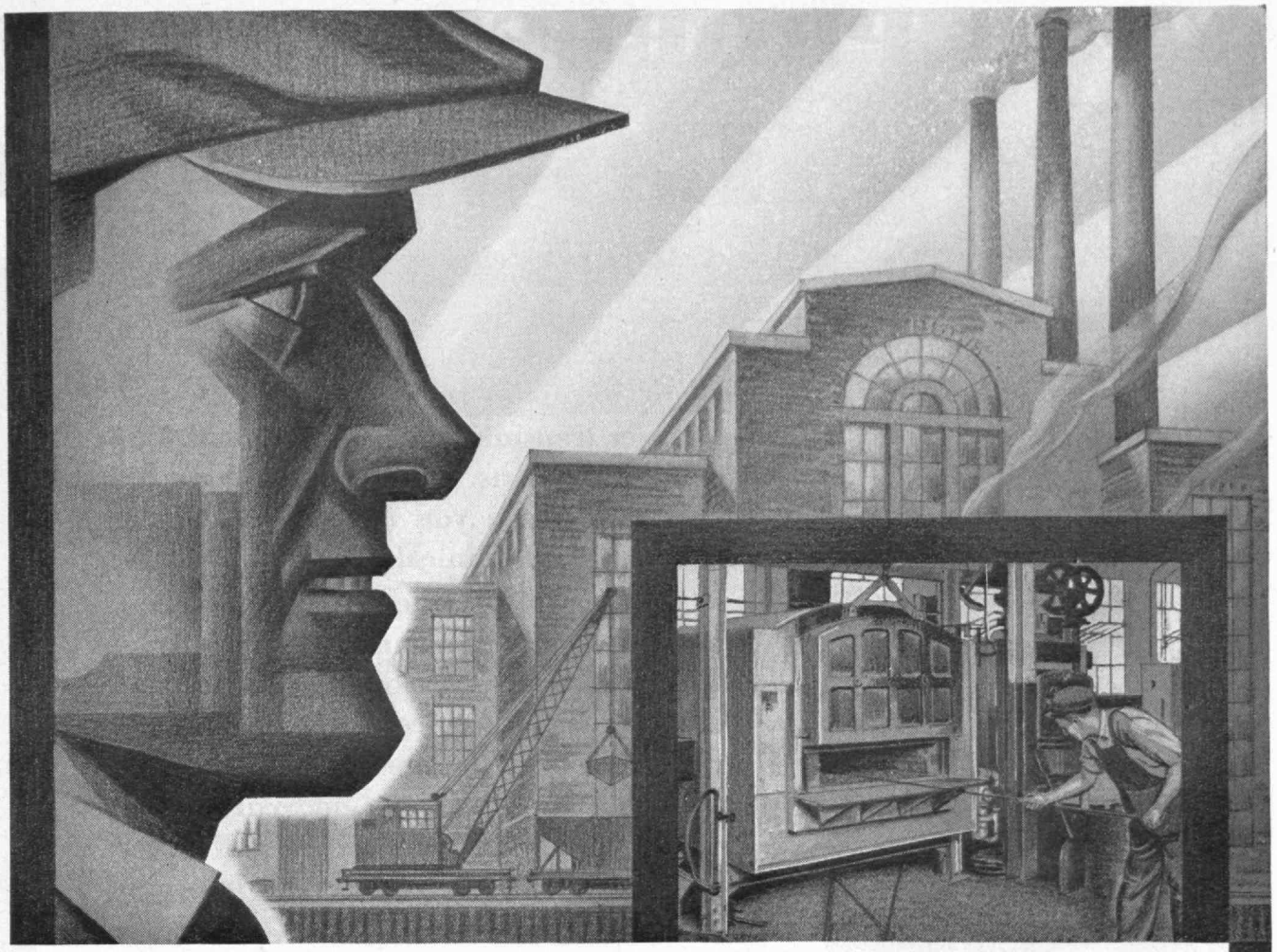
Resonance. When the support is rocked only one of the five pendulums responds

THE TABULAR VIEW

THE discussion on page 242 by Dr. KARL T. COMPTON, President of the Institute, is a notable contribution to the literature on technical and scientific education. It takes into consideration not only the situation as Dr. Compton has found it here at M.I.T., but the general aspects of the problem as it exists in all colleges where instruction is given in science and engineering. It has even a more general appeal, for it discusses the value of scientific and engineering education as compared to a purely liberal arts course of study.

PRESIDENT HOOVER'S Conference on Home Building and Home Ownership created a widespread interest in the more scientific and technological aspects of the design and equipment of small houses, and many people are vitally interested in new developments in this field. The question as to what direction improvements are to take was submitted by The Review to JOHN E. BURCHARD, 2D. The result is the very provocative article beginning on page 239. ¶ Mr. Burchard is well equipped to discuss the future of the home, having been associated for a number of years with the Housing Company of Boston which has been conducting pioneer and fundamental research in new methods and materials for building. Besides Mr. Burchard's professional work as Director of Research and Development of the Bemis Industries, Inc., he likewise has had a great variety of experience in academic work. A graduate of the Institute in the Class of 1923, he subsequently taught a short while in the Department of English, followed by a period as an instructor in structural design in the Department of Architecture. To the January, 1932, issue of *Architectural Forum*, he contributed "The Economic Thickness of Thermal Insulation," a paper which presents a formula for determining the insulation thickness which may be used by architects for any locality and under any given conditions.

INDUSTRIAL EQUILIBRIUM, by ROBERT F. ELDER, concludes the series of articles that have been published in The Review on current economic and business problems. Professor Elder received his A.B. degree from Harvard University in 1922, joining the Institute staff in 1929 as an instructor in marketing. The following year he became Assistant Professor of Marketing. In 1928, he won the Alvan T. Simond's Prize for a paper on "Reducing the Cost of Distribution." He has also written for publications of the American Management Association and a series of articles for *Factory and Industrial Management* on the Relation of Production and Distribution, which appeared under the general title of "Coördinating Sales and Production." ¶ In a forthcoming issue, The Review will present a discussion of German technical education prepared by two prominent German engineers. There will also be an important article on the history of computating ("thinking") machines, another on new developments in chemistry, and, of course, the usual departments.



Super-heat, vital to industry, must be controlled by Super-Refractories—"Alundum," "Crystolon."

INDUSTRIAL HEAT « »

"What are Norton Refractories?" A common question. Briefly, they are materials for handling heat, super-heat.

Super-heat serves industry — controlled by super-refractories — in gas, oil and electrically heated furnaces and kilns — in the form of bricks, muffles, plates, blocks, saggers, slabs.

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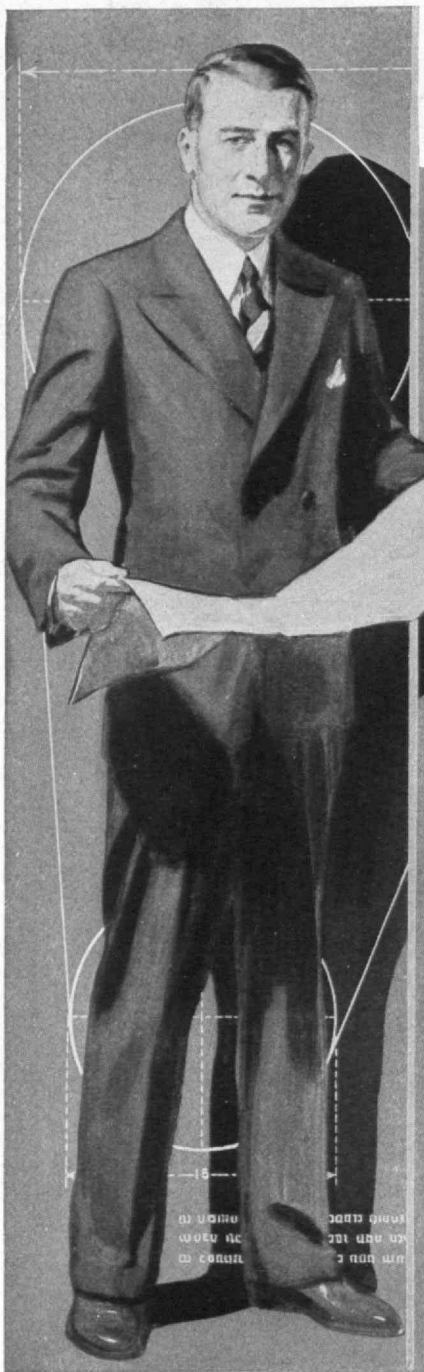
Great Industries No. 8

YOUR PROBLEM CAN BE HIS PROBLEM



IF YOU are thinking seriously about ways and means to reduce plant costs, such as power transmission costs, belt and hose replacement costs, let us suggest a conference between you and the G. T. M.—Goodyear Technical Man.

The G. T. M. is interested in lowering operating and maintenance costs by way of rubber. He is an expert on the values of rubber in industrial service. He has a practical knowledge of many operating conditions, in which he has specified *Goodyear Rubber* accurately, scientifically, successfully.

Often the G. T. M. saves money outright—on original installation and replacement costs. Practically always he helps make and save money through improved processes, increased efficiency, reduced delays.

Why not see if the G. T. M. could make and save money for you in your plant? He might take over several of your problems, make them his own, and give you the answer you hope for. To get in touch with him, write to Goodyear, Akron, O., or Los Angeles, Calif.

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HOSE
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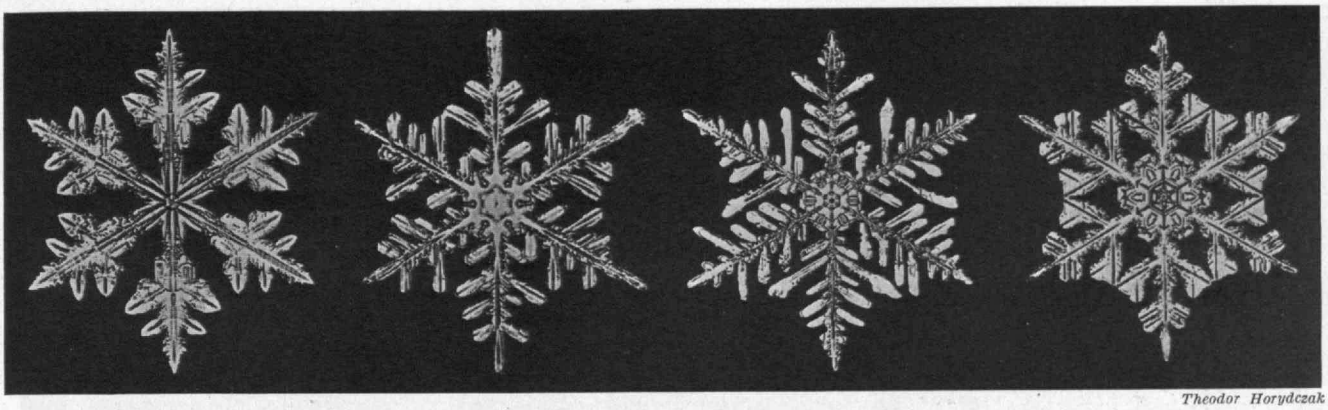

Theodor Horydczak

Photomicrographs of snow crystals from the W. A. Bentley collection (assembled by W. J. Humphreys)

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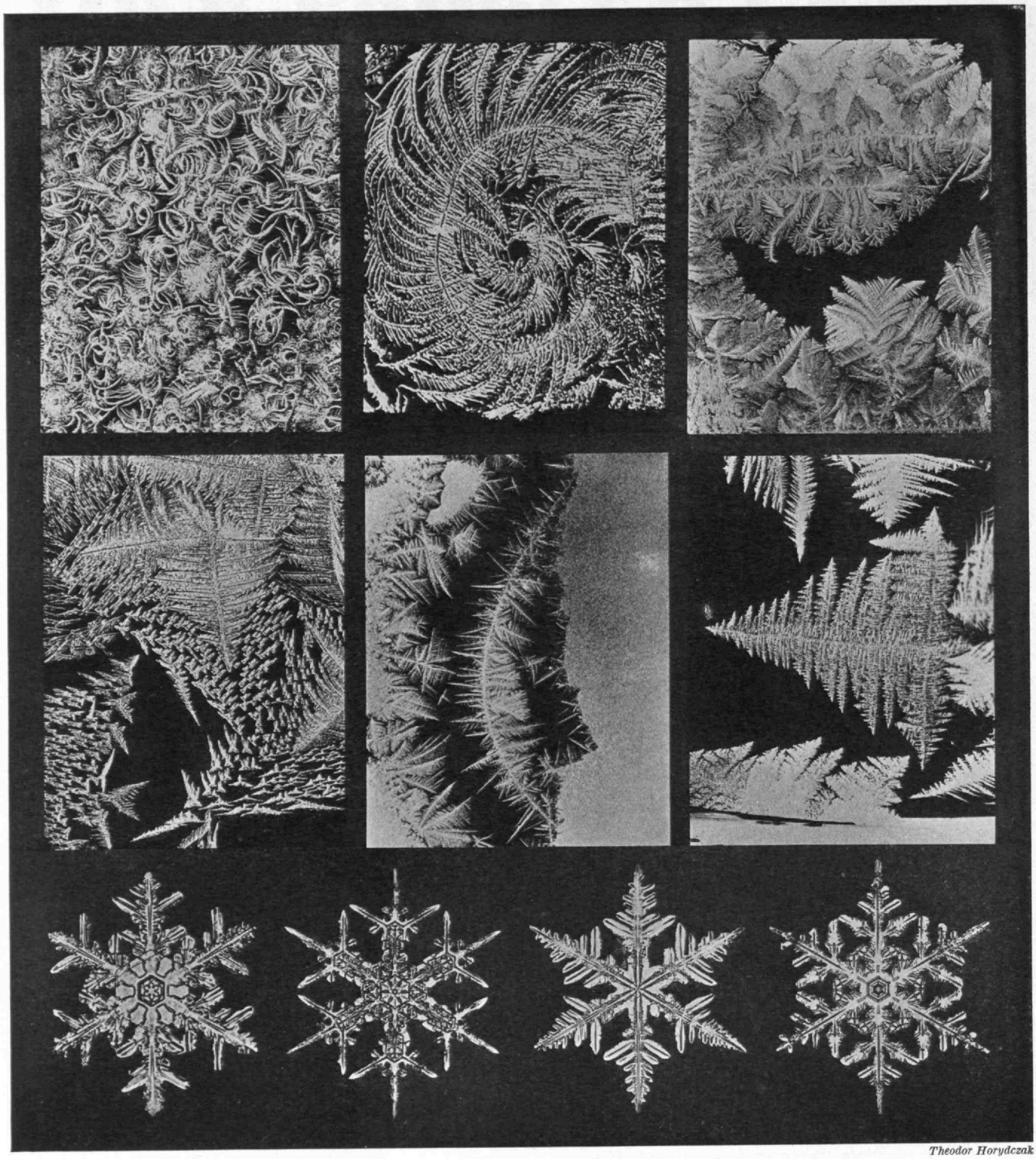

Theodor Horydczak

THE BEAUTIFUL PATTERNS OF FROST AND SNOW

SIX photomicrographs of windowpane frost and four of snow crystals from the collection of the late W. A. Bentley, of Jericho, Vt. Windowpane frost seems to gather along abrasions on the surface of the glass to form "the most delicate plumes and outdo the finest lace of hand or loom." The snow crystals are generally hexagonal in outline but of infinite variety in detail. ¶ *More than two thousand of Mr. Bentley's photographs of ice flowers, snow crystals, and frost have been assembled into a book by Dr. W. J. Humphreys, meteorological physicist of the U. S. Weather Bureau*

THE
TECHNOLOGY
REVIEW

Vol. 34, No. 6 March, 1932

HOUSES OF THE FUTURE

Or the Evolution of the American Home

By John E. Burchard, 2d

DURING the last few years the reading public has been deluged with an astounding array of marshalled fact and fancy relating to suppositional homes of the future. The question of modernizing the building of houses has naturally attracted the serious thought of many who would destroy this last embattled fortress of tradition. The manifold gadgets that have been successfully introduced to the susceptible householder, plus the awe-struck faith with which we accept all of the miracles of modern science, have logically combined to send minds, both deep and shallow, soaring on the wings of fancy. Unfortunately, all that has been needed to pen a few choice words on the general subject of future homes has been an ability to throw words together, a knowledge of the jargon of the house, and an unbridled imagination.

It may be interesting, therefore, to try to extract from the heap of mingled truths and vaporings the kernel of probability, and to hazard a serious guess as to what is likely to become of the home as we now know it in the next 25 to 50 years. With the rapid movements in social structure that seem to be accelerating, with the growth of practical science also apparently speeding up in accordance with some geometrical ratio, it would be dangerous to project the imagination any further.

We must be careful, too, to be very specific about whose house we talk. We shall, for the purpose of this article, confine ourselves to the United States, to a northern climate, and to a district neither super-urbanized, such as Manhattan Island, nor excessively rural. We cannot profitably consider the home of the poor man, the very existence of which entrenched statistics show to be an economic paradox. We certainly need not pay any attention to the home of the rich man who can afford to remodel anything to his personal desire. Accordingly, let us look at what will probably happen to the house of Mr. John Q. Averageman who comes to the city to work every day, who, around his detached house, has a little land on which he grows a tomato and a nasturtium, and who faithfully keeps up with the nearly latest model of refrigerator, radio, and Buick. For this period, unlike any that has preceded it, sings to the tune of the middle class.

The recent popularity of modernistic art and decoration, brought with a great deal of shouting to the United States by our traveled intelligentsia some years after it had fully developed in Europe (having been really initiated in our own country by Frank Lloyd Wright), has led many people to think that new houses of the progressive-minded will resemble the creations of Mallet-Stephens, Le Corbusier, Mendelssohn, and Dudok. Leaving out the question, which is quite seriously a real one, as to whether or not a home owner is progressive-minded in æsthetics, such a result does not seem likely. In the first place, the history of house development has generally been laboriously slow and quite clearly has taken place by evolution and not by revolution. A new form of decoration is quite all right, desirable, and presumably profitable for a store front, for advertising, and, perhaps, for a jazzy New York couple; but under the solid roof tree of the home owner, it has no place. It seems reasonable to expect that such

æsthetic principles as exist in modernism will be accepted only when they go hand in hand with utility. There is one room in the house where this marriage takes place and of it we shall speak at more length a little farther on.

Moreover, a careful study of modern houses evolved in Europe indicates that they have been developed primarily on the thesis (in so far as they are not merely an attempt to be different) that a great deal of light should be admitted to the house through windows and, as open air spaces are at a premium, roofs must be utilized to their fullest extent. The demand for light is less pressing in America where the sun actually does shine more often and more clearly than in Europe. The need for open space is also less keenly felt by the class of population with whom we are dealing than by similar peoples in Europe, who live nearer their cities because they are not reconciled to a minimum of an hour's commuting. Moreover, the desolation of a series of Corbusier's flat-roofed houses during a wet New England snow storm or a driving Minnesota blizzard is at once repellent and ridiculous. What merit has this sort of provision in our climate? It is only remotely possible that extensive development of the autogiro may demand a flat roof.

There is another serious factor about modernism bothering our Buick driver. Anyone who has tried to make his little 6′ x 8′ closet into a modernistic den will know what I mean. There is literally not a thing in our *mélange* of domestic accumulation that has any use whatever in the modern treatment. The wholesale scrapping of good solid value does not appeal to Mr. Average Citizen.

When we come to the structure of the new house, we tread on more dangerous ground. There is no doubt that something has to be done about it. Essentially, we have added nothing new to this structure since the Tudor period. Actually, a modern person could be and often is perfectly happy and comfortable in an Elizabethan or Jacobean house which has been modernized in its equipment. The building of houses is undoubtedly backward and needs serious study. And it is getting it. A great many very able men are working diligently on the problem. The general key to the solution seems to be the placing of different parts of the house on some sort of mass-production basis. This is not the place to raise the very serious question as to whether mass-production is economically sound in the long run when applied to goods that have long life and are not for immediate consumption. The big difficulty with the mass-production idea, even if the economic premise is sound, lies not in lack of flexibility, in sales resistance, or any other factor of that sort that may temporarily obstruct its progress. It lies in the fact that the mass-production principle needs mass-production to accomplish its economy and that the house susceptible of mass-production is sure to cost a great deal more in the first instance than the traditional structure. The *entrepreneur* has, therefore, many difficult days ahead of him before he can get sufficient output to justify his thesis. None the less, the house-building industry is a big one, aggregating many billions of dollars in any normal year, and some form of combined effort may change our structure quite radically. It would not be appropriate for me to endeavor to say in what way this will be done, if 'tis done.

One thing is certain. Any structure, even one that is completely non-revolutionary, must be given sufficient study in the near future so that each artisan does not cut and hack apart the work of his immediate predecessor in the process of building. In other words, there must be adequate preliminary provision for the placement of the accessories which are occupying a greater and greater portion of the entire amount allotted to the cost of a home. Every day some new piece of machinery is being offered to, and accepted by, the public until in this year, 1932, the mechanical equipment of the average home probably numbers at least as many moving parts as the stabled Buick in its attached garage. Curiously enough, despite this tremendous increase in mechanization, occurring principally in the last decade, the saturation point seems, by no means, to have been reached and it is to accessories that we must look for the bulk of the potential development of the immediate future.

First, however, we may note two or three evolutions of the plan which have partly taken place already and which stem directly from our mechanical civilization. The first is the gradual elimination of the porch. In a past, not so remote as to be forgotten by some of us who still feel pretty young, the front veranda was an essential adjunct to American life. We lolled on it in swings and read our books, drank our afternoon lemonade, and even played our evening whist. From its vantage point we watched the placid life of the neighborhood with a mild and friendly interest. But that was in the age of peace when the snort of an occasional buckboard exhaust was the only intimation of the advent of a period when rotation would become as significant as translation. There is no satisfaction in sitting on the front porch now, looking at automobiles as like one another as peas in a pod, filled with people none of whom we have ever seen before nor will ever see again.

Thus the front porch has developed into a so-called sun porch, which is really a sort of living room and more often than not opens on the back yard, where we can look at our little garden and have a modicum of privacy. This development is of great significance socially. It means that more and more we will place our kitchens and service rooms on the street side and take our living rooms, where they belong, into the more secluded areas of our property. It is further possible that in our large cities privacy may be obtainable by a revival of the inner court, or atrium, such as used in Rome and Pompeii. The immediate objections to such a revival would be our arduous climate and the dirt of the contemporary city. But neither of these is insurmountable. Cities may be cleaner in the future and, within the bounds of a modern metropolis, temperatures are materially higher than in the outlying vicinage. That by further evolution we will eventually retreat to the cellar when airplanes are common overhead visitors is by no means an insane idea.