April 1947

TECHNOLOGY REVIEW

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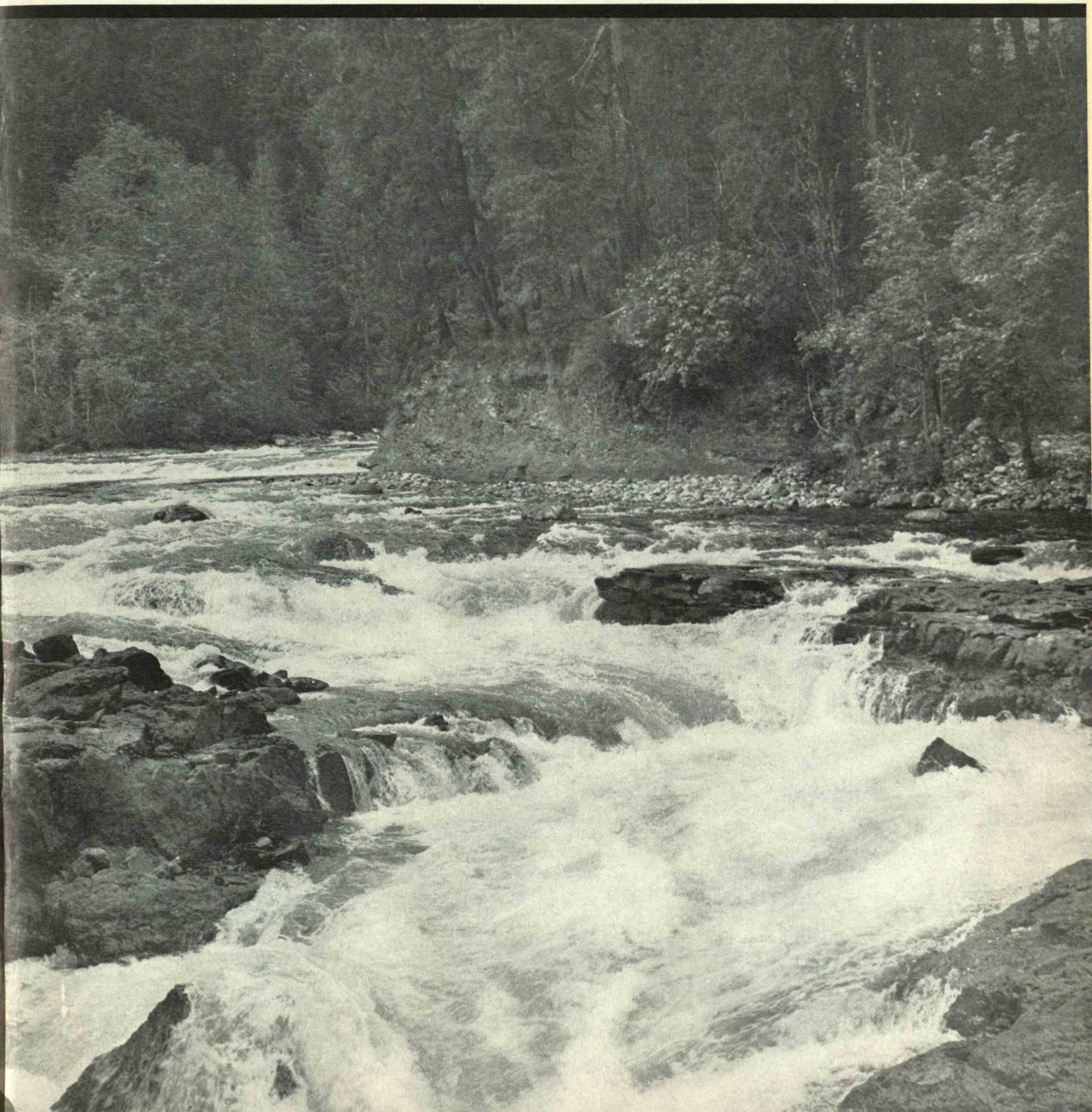
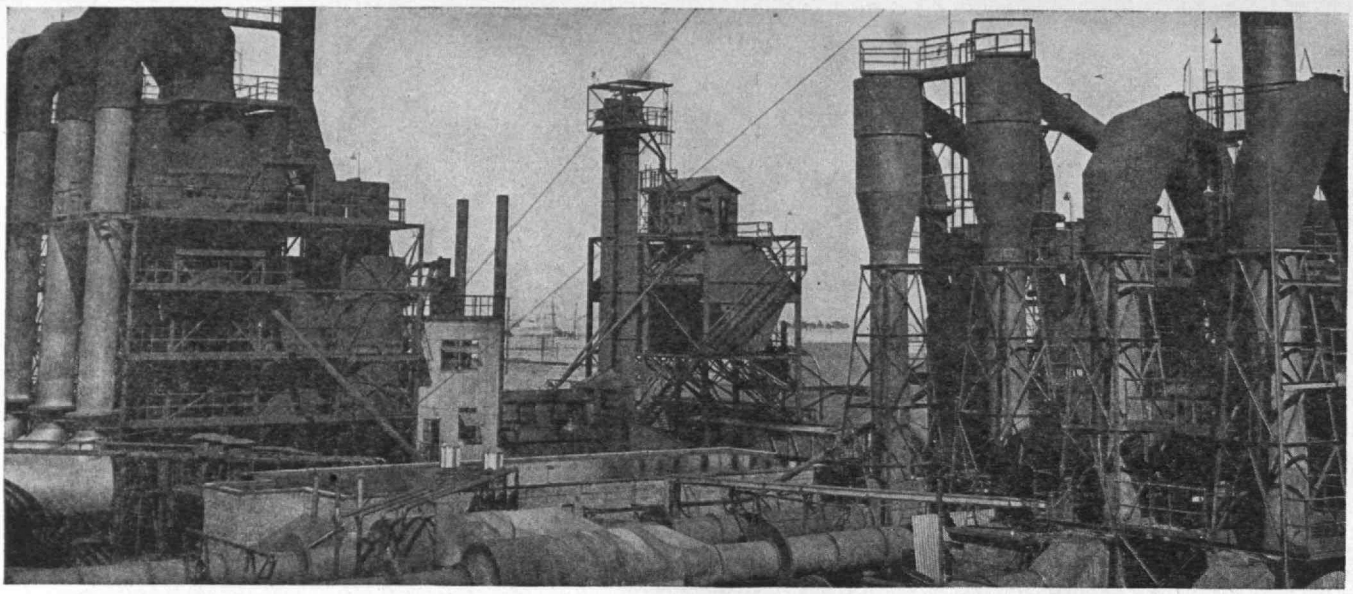




FOR INDUSTRY

Godfrey L. Cabot, Inc., and its subsidiary companies supply a broad sector of American industry with fundamental raw materials and some fabricated products. Behind these materials and products lies a background of thorough, painstaking research, geared to the most modern methods of production. By tradition and by training, all of the Cabot companies are research and production minded, and their output has to be *right* before it is offered for sale.

Carbon Black
Natural Gas
Natural Gasoline
Pumping Equipment
Pine Tar
Charcoal
Carotene
Chlorophyl

CABOT CARBON CO.
TEXAS ELF CARBON CO.
GENERAL ATLAS CARBON CO.
CABOT SHOPS, INC.
VALLEY VITAMINS, INC.

CABOT

GODFREY L. CABOT, INC.
77 FRANKLIN STREET · BOSTON 10, MASS.

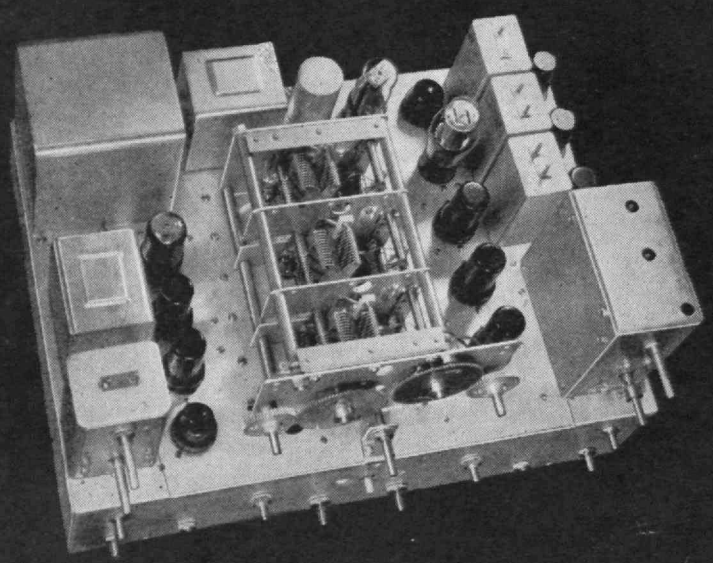
READY NOW

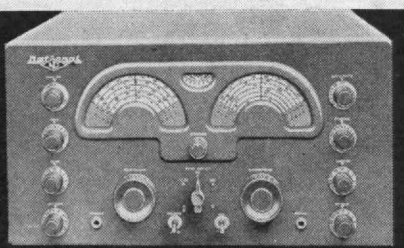
IN ANSWER TO HAMS' DEMANDS

EST. 1914

Hams around the world have been National's collaborators in creating the NC-173—ready now after five years of intensive research. Here are some of the advantages this 13-tube superheterodyne receiver offers:

- The NC-173's newly designed adjustable threshold double diode noise limiter—working on *both phone and CW*—has an extremely high limiting efficiency because of the short recovery time.
- Voltage regulated circuits give the NC-173 high stability and less drift for changes in powerline voltage. The pitch of code characters barely changes—even over extended listening periods.
- The S-meter circuit allows signal strength recordings to be taken on either *phone or code*.
- Works equally well on coaxial feedline, single-wire, directional or balanced antenna.
- AC powered. Will also operate on battery for portable or emergency use—110/120 or 220/240 volts, 50/60 cycle. Frequency range .54 to 31 and 48 to 56 MC. (Includes calibrated band spread on 5, 10, 11, 20, 40 and 80 meters).
- Ask your dealer to let you see and hear the new moderate-priced NC-173.





THE NATIONAL NC-173

NATIONAL

COMPANY, INCORPORATED

MALDEN, MASS.

THE MOST DISTINCTIVE NAME IN RADIO COMMUNICATIONS

Arnold presents:

another step towards a complete line of permanent magnet materials . . . . .

CAST ALNICO I

CAST ALNICO II

CAST ALNICO III

CAST ALNICO IV

CAST ALNICO V

CAST ALNICO VI

CAST ALNICO XII

SINTERED ALNICO

SINTERED ALNICO

In general SINTERED ALNICO MAGNETS do not compete with, but rather supplement, magnets produced by the cast method to widen the scope of potential permanent magnet applications.

Alnico magnets weighing roughly one ounce or less should be produced by the sintered method.

Heavier magnets of more intricate shapes can be produced. For some applications Sintered magnets are more economical because:

1. Magnetic characteristics are practically the same as Cast Alnico.
2. Sintered Alnico is a fine-grain, homogeneous material which has more uniform flux density, is easier to grind, and provides better surface finish.
3. Sintered Alnico magnets can be produced to closer dimensional tolerances:

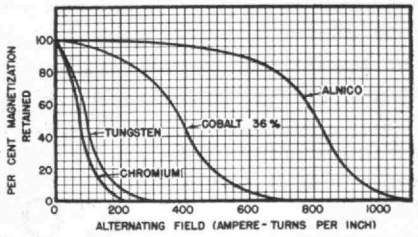
SINTERED ALNICO II	CAST ALNICO II
0.000 to 0.125 — + .005	0.000 to 2.00 — ± 1/64
0.126 to 0.625 — + .010	2.0 to 4.0 — ± 1/32
0.626 to 1.250 — + .015	4.0 to 6.0 — ± 3/64
1.251 to 3.000 — + .062	

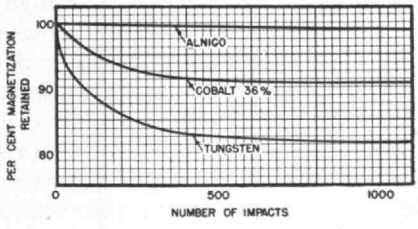
Grinding can in many applications be eliminated.

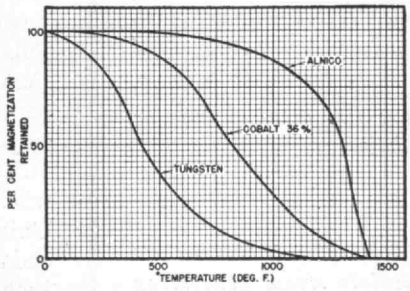
4. More intricate shapes, including holes, inserts, etc., are more feasible.
5. Transverse modulus of rupture is several times greater.

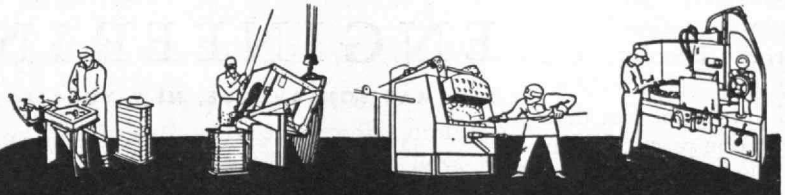
All Alnico, and particularly Sintered magnets, have very high values of Coercive Force (which is the capability of resisting demagnetization or loss of magnetism due to stray fields and from heat and vibration).

The curves show roughly the effect of these demagnetization factors on Alnico compared to other alloy steels.







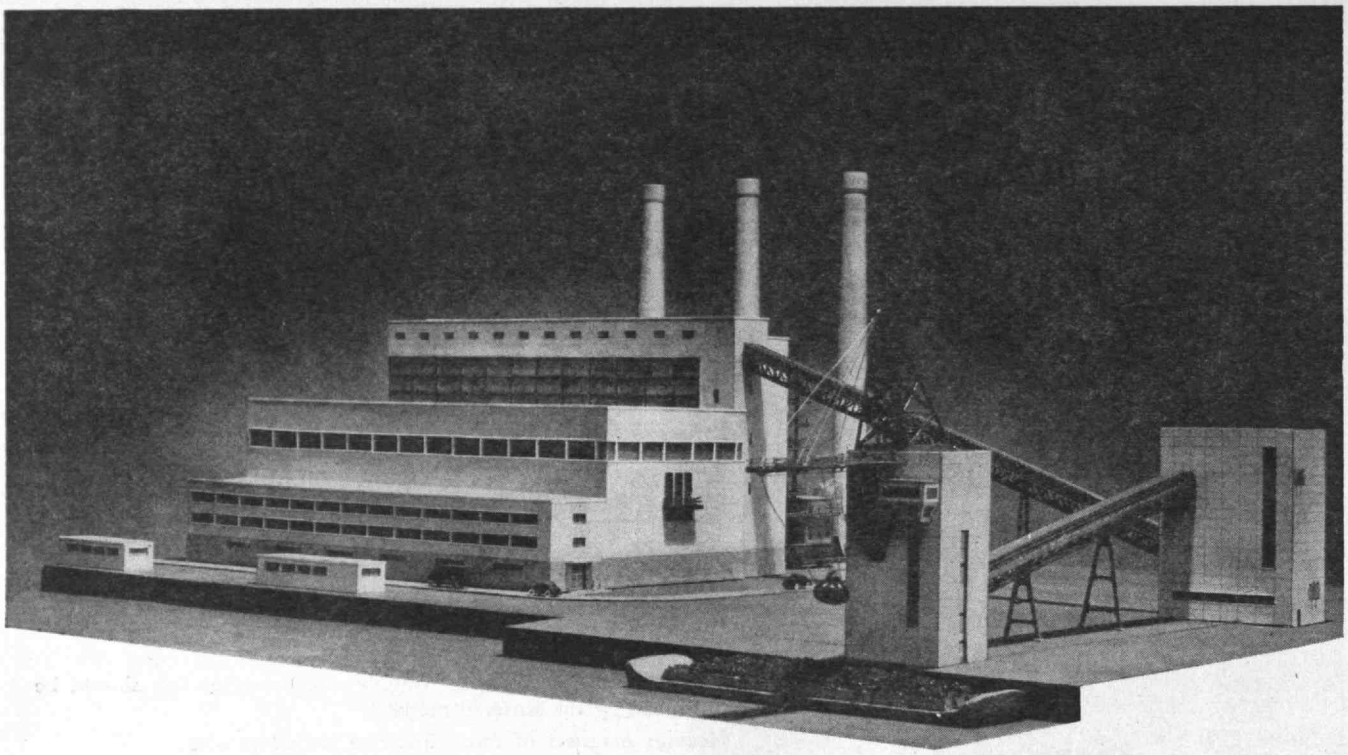


THE ARNOLD ENGINEERING COMPANY

SUBSIDIARY OF ALLEGHENY LUDLUM STEEL CORPORATION

147 EAST ONTARIO STREET, CHICAGO 11, ILLINOIS

Specialists in the manufacture of PERMANENT MAGNET MATERIALS



Steam will be hotter – at Sewaren

These three factors are the unwritten plus-values in every C-E contract –

Knowledge – *to solve today's, and tomorrow's steam generating problems.*

Experience – *to interpret, from a world-wide background in every important industry, the specific needs of each installation.*

Facilities – *to manufacture complete steam generating units for every requirement, from 30 boiler horse power up to the largest.*

In a power plant, steam temperature has a direct effect on economy and efficiency. Higher temperatures mean lower fuel cost and greater efficiency. But progress has trodden on the heels of the metallurgists and designers. Twenty years ago 750° F was a daring experiment. Today, with new alloys and improved designs, steam temperatures have passed the 1000° mark.

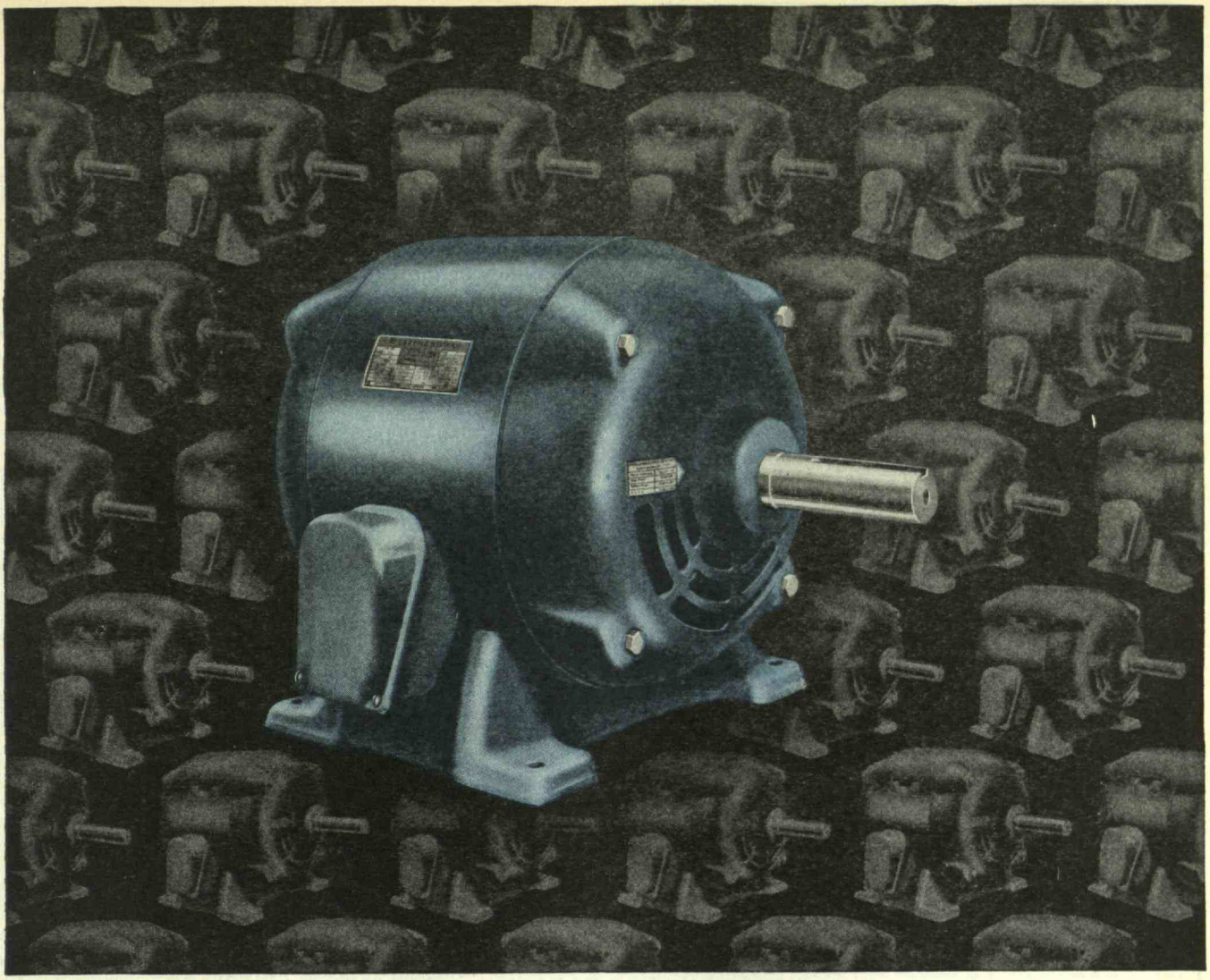
At Sewaren, New Jersey, the newest power station in the Public Service Electric & Gas Company system, steam will be generated . . . for the first time in power station practice . . . at 1050° F. The initial section of this station will house three huge C-E Steam Generating Units supplying steam at this temperature and at a pressure of 1500 pounds per square inch to three 100,000-kilowatt turbine generators.

The end, of course, is not in sight. Still higher steam temperatures will permit still greater economy and efficiency in power generation as soon as metallurgists can provide boiler and turbine designers with suitable materials. Combustion Engineering has played, and will continue to play, a leading part in this development. C-E was the first to design and build a boiler unit to operate at a steam temperature above 900° F. It is again first in the range above 1000° F.

And the same engineering vision that has aided so materially in the development of high temperature units is reflected in C-E steam generating equipment for all industry, from units of 30 boiler horse power up to the largest yet built. B-116

COMBUSTION ENGINEERING

200 MADISON AVENUE, NEW YORK 16, N. Y.



How to make one motor fit all user-ideas

For years, motor users complained that no one motor had *all* the features they wanted most.

Westinghouse engineers surveyed motor users to find out exactly what they needed . . . and then tailored an entirely new motor to fit those requirements.

The result is the new, outstanding Life-Line motor that has more benefits users asked for than any other motor made today. For example, it is the first motor that:

1. *Requires no lubrication for at least 5 years*

This means more to the user than just the elimination of lubricating. It lets him use motors in his production line wherever they fit best, without regard to easy access for frequent servicing.

2. *Is much smaller than predecessor*

What's more, it's lighter, more rigid and can withstand greater impact because of the all-steel frame. All of these benefits offer important advantages to every motor user.

3. *Produces 134% more power per pound*

Despite its lighter weight and smaller size, the new Life-Line motor gives users 134% more power per pound of weight.

The exclusive Life-Line motor is a prize example of the way Westinghouse studies the needs of industry and develops equipment to answer those requirements. It's part of Westinghouse planned research in every field of science to give industry—and you—better products.

J-99672

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

THE TABULAR VIEW

Tumbling Waters.— The cover for this issue of The Review is from a chlorobromide print originally exhibited at the Technology Galleries by SHIRLEY M. HALL of San Marino, Calif. Although it is not every month that we are privileged to reproduce the work of a fellow of the Royal Photographic Society, several of Mr. Hall's prints have appeared in The Review's pages during the past year, with benefit to this publication and, we hope, with advantage to the photographic artist. The Review takes this opportunity to express the hope that the work of many another may be reflected from the pages of its future issues.

For All to See.— Television continues to appeal with tremendous interest to the vast majority of people in this country, even though the decade-old promise of early widespread use of the new visual agency has not, even yet, materialized. But if it has thus far failed to make its entry into all but half a dozen of our largest cities, if it is still waiting to round that famous corner, television has nevertheless already made substantial contributions to technical progress in electronics, wire and radio communication, and radar, as is recorded (page 333) by DR. V. K. ZWORYKIN, associate director of the R.C.A. Laboratories.

Paving the Way.— Back of the successes of our armed forces lie months of planning, preparation, and engineering construction, all of which are urgently needed to pave the way for the culmination of modern tactical operations. Drawing upon the rich background of navy experience, built up since his graduation from the Institute in 1917, COMMODORE W. MACK ANGAS adds to the list of articles he has written for The Review to present his vivid account (page 337) of the splendid work of the Seabees of the Seventh Fleet, described as providing the "Stepping Stones to Victory."

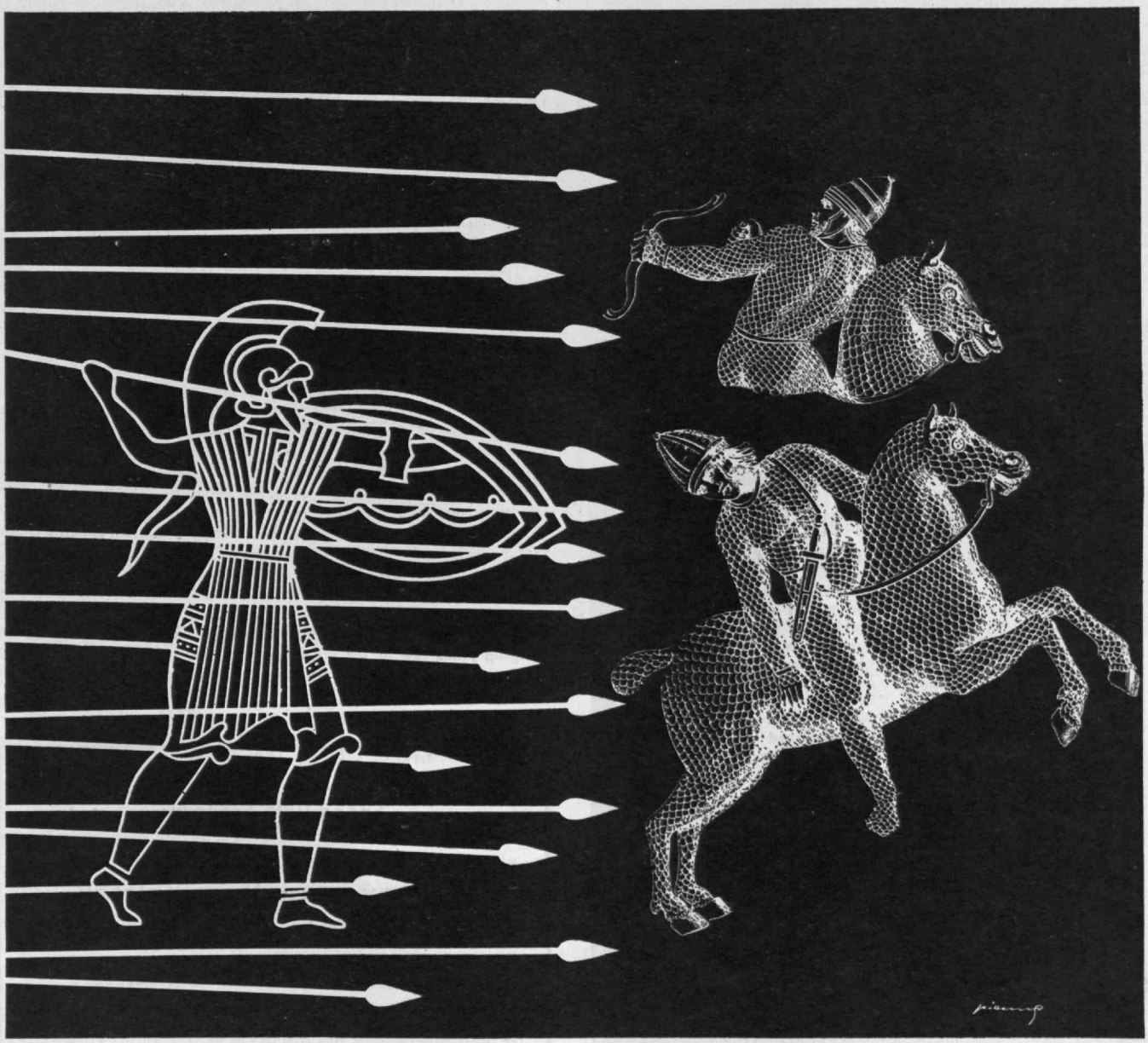
City Slickers.— Pursuing his favorite topic of social movements and the human aspects of modern industrialism, PAUL MEADOWS outlines (page 341) the difficulty which the city dweller finds in becoming a significant human being. Although viewing the problem with the detached point of view which might be expected from a professor of sociology at the Montana State University at Missoula, Dr. Meadows has had at least one chance to observe, firsthand, the effects of metropolitan industrialism in the Chicago area while studying for his doctorate at Northwestern University.

Error of Our Ways.— Although based on observations in the field of anthropology, in which he is recognized as scholar and skilled writer, the admonitions of M. F. ASHLEY MONTAGU (page 345) are equally valid, and applicable, in any field of human endeavor. The errors into which man has sometimes been led are particularly disturbing and significant to those in scientific pursuits. Dr. Montagu, a frequent contributor to The Review, is associate professor of anatomy at the Hahnemann Medical College and Hospital of Philadelphia.

THE MACEDONIAN SURPRISE PARTY

When the proud Persian hordes plunged headlong at Philip of Macedon's army, they were dumped into the minor leagues by an entirely new strategy, the phalanx: a solid wall of warriors sixteen ranks deep. Strength-in-depth withstood and defeated the impact of an over-confident enemy.

Molybdenum steels are economical means of getting the strength-in-depth called hardenability. With it, you're assured of dependable performance under severe service conditions. Practical facts are available to show you where molybdenum can go to work for you.



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MOLY

MAIL RETURNS

Hobgoblins in the Library

FROM CHARLES H. BLAKE, '25:

In his article "The Wreck of Matter and the Crush of Worlds" in the November, 1946, issue, John Burchard has given an excellent summary of the real and increasing problems which face those who have to deal with the still-growing output of "literature." One can take no real exception to anything he says. Even so, I am moved to raise one doubt and to underline one problem.

The doubt pertains to the validity of extrapolations of the growth curve of literary output. We know that the growth rate of literary output has increased within historic times but it is contrary to all evidence on population growth to suppose that it will continue to increase geometrically for an indefinitely long time. In view of the attained or approaching population peak of the western nations, I raise the question whether, even with due allowance for continued population growth in the eastern nations, we are not fairly near the peak of literary growth rate. Please note the distinction between growth and growth rate; even if the rate is stationary, the annual increment may still be appalling. Let the librarians give some thought to making real and meaningful extrapolations rather than raising hobgoblins.

The essence of the whole matter is to render accessible what exists. It is suggested, as often before, that the solution is a business machine system. Burchard recognizes, and it cannot be too often emphasized, that the crux of the problem is not the machine but the brain governing the machine. I venture to suggest that only a small fraction of productive workers have both the temperament and the type of mind that would make it possible for them to give even a fraction of their time to being the brain behind a machine.

The problem of punching a card is more complex than it appears at first sight. Even the question of how facts are classified has no simple or routine solution. I remember vividly the distress of one of the men from the Center of Analysis at M.I.T. who consulted me in quest of a "formula" for classification, and was told that the biological taxonomist had no such formula and considered each case on its own merits.

It is hardly necessary to stress the foremost biological difficulty, the very number of entities, their shifting ranks and positions, and changes of view as to synonymy. We need only mention that there are said to be over 160,000 generic names of animals in current use and untold thousands of synonyms for them. I have just taken down Tuthill's account of North American jumping plant lice and find 25 synonyms against the first 10 generic names. Most of these synonyms are more or less frequent in the literature as valid names, either for jumping plant lice or for other insects. The problem of tying these synonyms together by cross references becomes worse than the straight indexing.

(*Concluded on page 354*)