TECHNOLOGY REVIEW Jebruary 1952





Typical view showing Webster Walvector (B) providing heat the full window length, column to column. The steam risers and the returns are in alternate columns. Webster Radiator Valves provide shut-off of the heat in each bay.

Steam Cost 12% under estimate

The Commerce Building, first new office building in Harrisburg since 1935, is obtaining Webster Tru-perimeter Heating results with Webster Moderator low-pressure steam heating, using 12% less steam than estimated.

The Pennsylvania Power & Light Co. estimated the cost of steam for heating at \$3,527 per season. Meter readings for the first complete heating season showed steam cost of only \$3,101, less by \$426 than the estimate.

Architect William Lynch Murray specified a Webster Moderator System to assure "controlledby-the-weather" economy in this 13-story building; Webster Walvector (R to spread the heat the full length of exposed walls.

Edward H. Bower, managing director and coowner, says: "The continuous radiation beneath continuous window bands is just what we need. All sections of the building heat evenly, rapidly and comfortably regardless of outdoor weather conditions."

Webster Tru-perimeter Heating with steam or hot water is a development you will want to know more about when planning new buildings or extensive modernization. It is a development of the Webster organization—with direct representatives in 65 U. S. cities working with architects, engineers and heating contractors in the solution of specific problems of heating. Write us or get further information from your Webster representative.

Address Dept. TR-2

WARREN WEBSTER & COMPANY Camden 5, N. J. Representatives in Principal U. S. Cities In Canada, Darling Brothers, Limited, Montreal





Commerce Building, Harrisburg, Pa. Architect: William Lynch Murray & Associates. Mechanical Engineer: Benj. A. Johnson. Heating Contractor: Herre Brothers.

Inset shows the heart of the Webster Moderator Control. Variator and Electronic Pressure Control Unit shown here operate in conjunction with the following equipment not shown: Outdoor Thermostat, motor-operated Main Steam Control Valve, and extended tube orifices installed in each Walvector () unit.



All but one of the objects in this picture have something in common—Norton or Behr-Manning abrasive products are important factors in their manufacture and in their quality. Can you find the stranger?

The Submarine Truck? No! True, it's out of place in a swimming pool...but hundreds of its parts were produced with the help of Norton grinding wheels and machines and Behr-Manning abrasive products.

The Tile Floor? No! Both the curb and mosaic tiles are Norton floor products... unique because they are made non-slip, even when wet, by ALUNDUM abrasive. And, like many other tiles, they were fired in kilns lined with Norton refractories.

The Gasoline in the Pump? No! As it passed through the refinery on its journey from oil well to you, Norton high temperature refractories and catalyst supports were important quality factors. The Football? No! Many vital operations in the manufacture of leather require Norton and Behr-Manning abrasive products. For instance, drums wound with Behr-Manning coated abrasives condition the grain before coloring – rough the surfaces for secure cementing.

The stranger in the picture is the cobweb. Remember, the manufacture of any man-made product... whether of metal, wood, paper, cloth, leather, ceramics, or plastics . . is dependent upon abrasives, abrasive products, refractories, or grinding machines that bear such well-known trade-marks as Norton and Behr-Manning ... the world's largest manufacturers of abrasives and abrasive products.



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Graver's Double-Deck Floating Roof has built an impressive record of efficient operation in the services for which it was specially designed. Send for new illustrated book.

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The Graver seal effectively closes the gap between floating roof and tank wall. Dependable, durable, fire-resistant.

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They keep coming back for more

One thing that distinguishes a boiler from most other types of equipment is that its *annual* operating cost is more than its initial cost. In fact, the annual cost of *fuel alone* for the average boiler installation usually *equals* or *exceeds* the purchase price — and the purchase price of a boiler represents a sizable capital investment.

1001 %

With fuel costing what it does today, it is more important than ever before to select a boiler that will assure the most efficient performance possible. That is why it is especially significant that people who have bought C-E Vertical Unit Boilers — and know these boilers through their own experience—continue to buy them.

Just glance at the examples at the right. It's just a small sample of the plants — in industry after industry — that have ordered and reordered VU Boilers.

Why not investigate the VU Boiler for *your* next installation. Our recommendations as to the most suitable type of VU Unit for your particular requirements are available to you or your consultants without obligation. A Chemical Company ordered two VU Boilers in 1939. In 1946 five more were ordered for three of their other plants. In 1949 two more were ordered for one of these same plants, and in 1950 two more units for a fifth plant. In 1951 three more units were ordered for still another plant — thirteen units for six plants in twelve years!

A Steel Company now has a total of eleven VU Boilers in four different plants. Starting with three units in 1936, it has reordered three times ... most recently in the fall of last year with an order for three more units.

A Textile Manufacturer ordered two VU Units in 1936. Another unit was installed in 1940 and a third in 1944. Still another textile company installed one unit in 1945, a second in 1949 and has just ordered another.

An Electric Utility Company installed its first VU Unit in 1941. Two more units were ordered for another plant in 1947, a unit for a third plant in 1946 and still another for a fourth station in 1949.

A Refining Company ordered one VU Unit in 1937, another in 1940 and another in 1949 for one of its plants; also two in 1942 and one in 1947 for another plant. B-486

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Pride of Independence.—In an era in which fiscal philosophy is all too commonly characterized by the search for gifts, it comes as a refreshing stimulant to be reminded that there are still hardy souls with sufficient pride and independence to finance their own collegiate education. For more than two decades the Technology Loan Fund, established through the foresight and able leadership of Gerard Swope, '95, has aided worthy students in financing their M.I.T. training. A statistical survey of the operations of this fund is given (page 181) by H. E. LOBDELL, '17, who has served as chairman of the Technology Loan Fund Board since its inception in 1930. As Dean of Students at M.I.T. and now as Executive Vice-president of the Alumni Association, Mr. Lobdell has had unique opportunities to witness the salutary effects of Technology Loan Fund operations. There is no way of assessing the character-building benefits of a program which stimulates self-reliance. But many of those who borrowed from T.L.F. for advancing their education now hold important positions of responsibility in industry, civilian government services, or the armed forces. This fact should be cause for gratification to all who have administered the fund.

In Short Supply.—With the nation's security dependent upon the most effective use of its limited resources of material and man power, PAUL COHEN, '35, offers a timely contribution (page 186) with his survey on the present shortage of engineers. As an editorial associate of The Review since 1938 and currently also engineer for the Sperry Gyroscope Company, Mr. Cohen is well acquainted with the problem and admirably equipped to discuss its seriousness. A substantial portion of Mr. Cohen's article deals with the role which American colleges can play in alleviating our present man-power deficiency through research. In this he makes extensive use of statistical studies supervised last summer at M.I.T. by John I. Mattill, Assistant Director, News Service.

Transport Helicopters .- The first of a two-part article on "The Significance of the Helicopter" by L. WELCH POGUE, appearing in the January issue of The Review, was devoted to a discussion of the versatility of the small helicopter. In this issue Dr. Pogue concludes his article (page 190) by outlining the present military uses and the anticipated commercial applications of transport helicopters designed to carry a load of as much as 10 tons. Prophecy is always likely to be dangerous, of course, but on the basis of the military uses of helicopters in Korea alone, there is every good reason to hope for early commercial service by transport helicopters. As this issue goes to press, Royal Air Force helicopters make the headlines as they stand by, on Britain's southwest coast, in readiness to rescue the skipper of the Flying Enterprise. Altogether, Dr. Pogue (whose biography appears on page 124 of the January issue) makes out a good case for the future of the helicopter.

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MOLYBDENUM

This 400pp. book describes the varied applications of Molybdenum as an alloying element in a wide range of materials. It presents the fundamentals which must guide the selection of the most suitable alloys for specific applications.

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The book is available free on request by metallurgical and engineering students.

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MAIL RETURNS

Offbeat

FROM CLARK S. ROBINSON, '38:

I enjoyed the article by James L. G. FitzPatrick on "Some Thoughts on Natural Flight," in the November, 1951, Review. I would like, however, to call attention to an error on page 53. The frequency of wing beating is given as

$F = 4W^{0.833}/M$

and it is stated that W and M may be measured in any convenient units since they have the same dimensions. Actually the units do not cancel, since W is raised to the power 0.833. From the second formula Mr. FitzPatrick gives for F, it is evident that both W and M must be measured in pounds.

Champaign, Ill.

[The sentence is a carry-over from an early draft and should refer specifically to the first powers of the weight ratio mentioned. The formula shown is a shortened form of $F = 4W^{-1/6} \cdot W/M$

In his notes the author referred to W/M as the specific loading (L_*) and it is this alone which is dimensionless. If kilograms are substituted for pounds in the published form, the constant becomes approximately 4.8 - Ed.

Precedent Broken

FROM FREDERICK BERNARD, '17:

I do not make a practice of writing to editors but wish to compliment you on the December, 1951, Review. All of the articles appealed to me as being of outstanding interest but I was particularly impressed with "The Lowell Institute School" by Arthur L. Townsend.

I would wager that most of our Alumni knew as little about the Lowell Institute as I did, which, in essence, was that it was a worthy project and that it was very generous of M.I.T. to let Lowell Institute use their plant facilities. I had no knowledge of the intimate relationship of the two institutions over a long period of years. It is true that M.I.T. does make a major contribution to the operation of Lowell Institute but in the early days it appears to have been a case of the tail wagging the dog. *Wellesley Hills, Mass.*



DC. M. CHOPPER

How would <u>YOU</u> control costs here?



PRODUCTION LOSSES were eliminated on Fuller Brush Company assembly machines. Faulty control of viscosity of the special sealing compound, used to make handles stay put, resulted in costly breakage of expensive equipment and burned-out motors. Now, a low-cost Fenwal THERMOSWITCH thermostat prevents damage by starting the motor only when viscosity is right.



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remember ... more people ride on Goodyear tires than on any other kind



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