

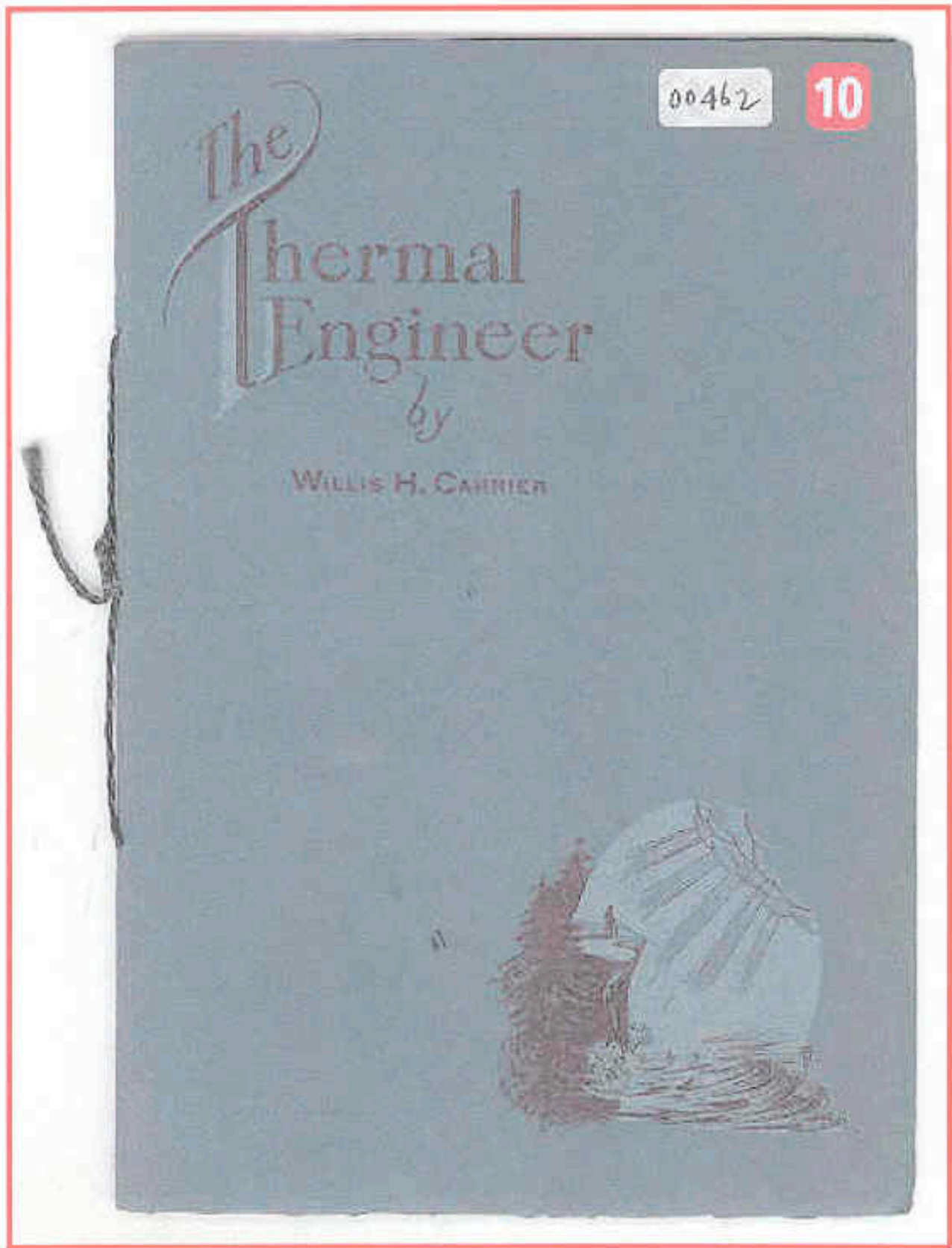
Willis Haviland Carrier

Father of Air Conditioning

VOLUME-2
Carrier in the Heritage Group Collection



2.4 Articles on Education



*Education 1: The Thermal Engineer, 1927
[American Society of Refrigerating Engineers]*

W. H. Carrier
July 5, 1944

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ENGINEERING EDUCATION

(First Lecture)

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Continual Progress in Education:

The generally accepted idea is that the engineer gets his education in high school and college. If this accepted idea were correct, the quality of our engineering would be extremely poor. Unfortunately, too often this same idea is prevalent among the more recent graduates and I have known men of excellent natural ability in our own organization who required ten years of experience in the field to discover that this was not true. Generally, however, the engineering graduate discovers this fact for himself in the first two or three years. If he is a conscientious and thorough-going person of a type that will ultimately succeed, he sets about either consciously or unconsciously to further his education. I did not say "complete his education" because if he is a person who will continue to advance in his profession, contrasted with one who "goes to seed" and becomes a casualty; he will realize that his education never will be completed. He will continually progress throughout his useful lifetime. My hope is that you may take this viewpoint and as a result strive continually to advance your education, whether it be in pure engineering, management or salesmanship. It is my sole reason for addressing you on this subject.

Defects in Elementary Engineering Education -- (Should Teach Approach to Knowledge):

I shall start out by telling you that I consider the character and methods of education which most of you have received is unfortunate. With few exceptions, the quality of teaching, from grammar school all the way through college, is not only poor but in the majority of cases has the wrong objective as well as the wrong approach. From my own viewpoint, which I may say is also

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By W. H. Carrier, D.Sc., D.E.

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The exigencies of the world war have profoundly affected developments in nearly all branches of the arts and sciences. Although they brought many peace-time developments completely to a standstill, preponderantly, they have greatly accelerated developments in many fields. Both of these effects have been in evidence in the two closely allied arts of air conditioning and refrigeration. It is not always possible to distinguish between developments that have been delayed in application but gradually brought to a successful conclusion during the war and those that have been wholly suggested by war use, which are sometimes alien to their ultimate peace-time application.

The exacting requirements of air conditioning have led to improvements and developments in refrigerants, in refrigerating machines, and in refrigerant processes. Refrigeration, with the control of moisture and temperature, is essential in any complete process of air conditioning. While it is true that processes of absorption of moisture directly from the ventilating air by means of physical or chemical absorbents have been developed, their use to date has been limited to the production of extremely low humidities required by certain industrial processes. Refrigeration still remains not only the essential element in cooling but also the preferred method of air dehumidification for normal air conditioning requirements. Developments in refrigeration during the past twenty five years have probably been brought about through the demands of air conditioning to a greater extent than by the demands of all the other refrigeration applications combined.

The first demand in refrigeration for air conditioning is absolute safety; the second, flexibility in handling variable loads; third, simplicity in operation requiring a minimum of expert attention; fourth, reliability and low maintenance cost. In fact the successful commercial development and widespread use of air conditioning depended more upon such successful developments in the refrigeration art than upon any other consideration. Applications of air conditioning which before were impracticable were, by this means, made practical. It is therefore impossible to discuss developments in air conditioning without considering the corresponding developments in refrigeration which made the former possible. It is for this reason that developments in refrigeration as applied to air conditioning must be discussed as a part of air conditioning development.