MARGARET INGELS

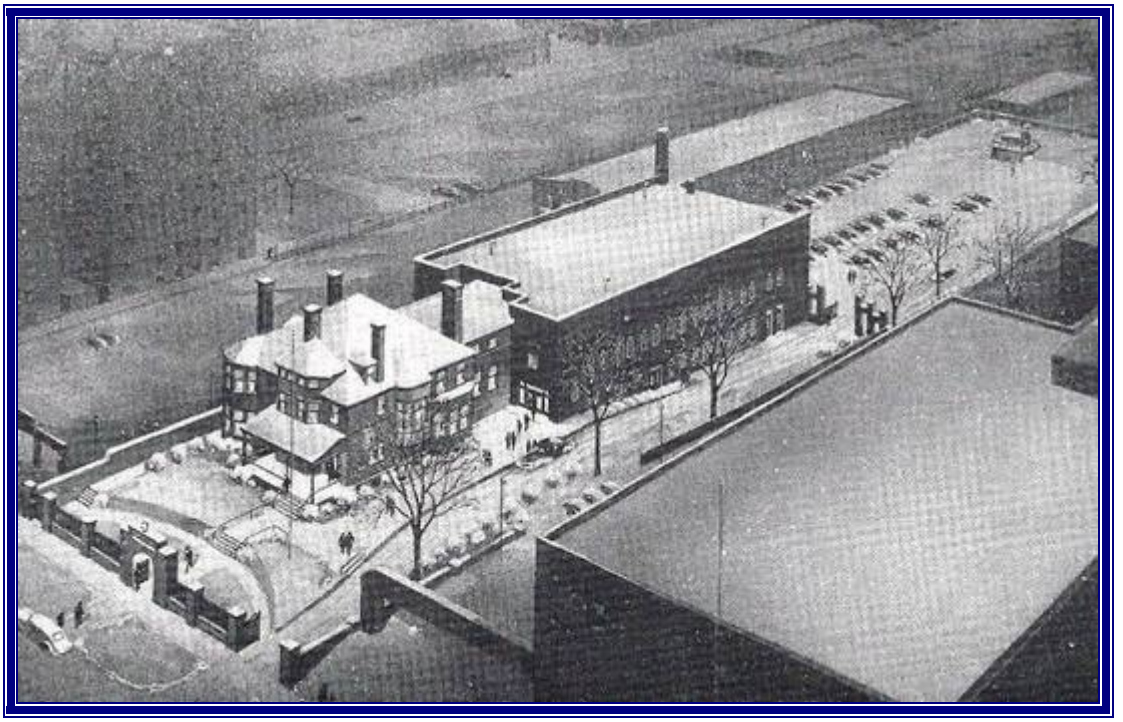
By EurIng Brian Roberts, CIBSE Heritage Group

Margaret Ingels, 1892-1971

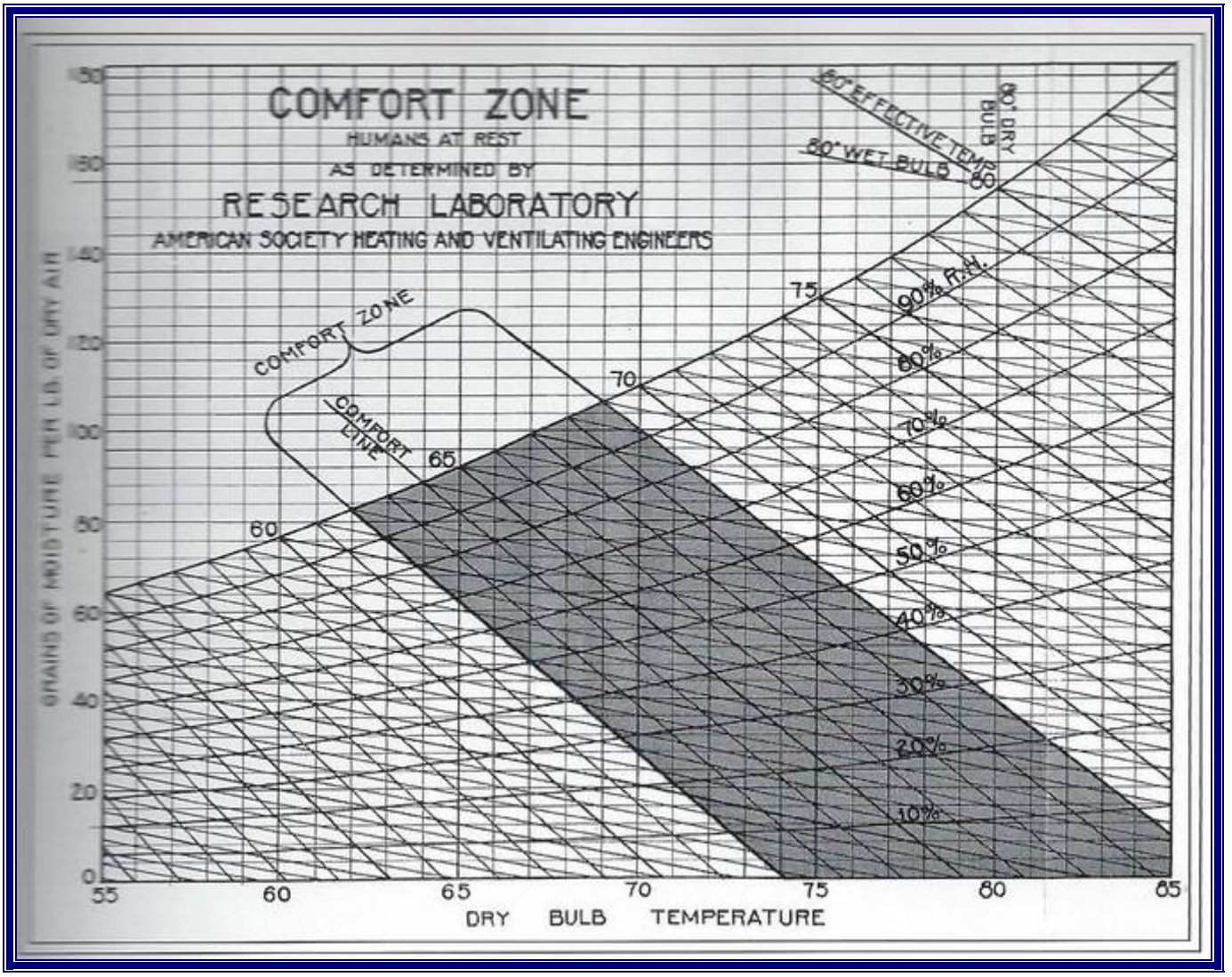
Margaret Ingels was born in 1892 and became a student of F Paul Anderson, Professor and Dean of the School of Mechanical Engineering at the A&M College of Kentucky (He was the first person to be inducted into the ASHRAE Hall of Fame). Ingels was the first woman to graduate from the University of Kentucky School of Engineering and the second woman to receive an Engineering Degree in the United States. She received national attention and was invited to the White House.

In 1917, Ingels was either the first or second female (accounts differ) to join the ASHVE. In 1921 or 1922, she joined the staff of the ASHVE Research Bureau, working for F Paul Anderson, the Bureau's second Director. Around 1926 she was appointed Mechanical Engineer & Research Head.

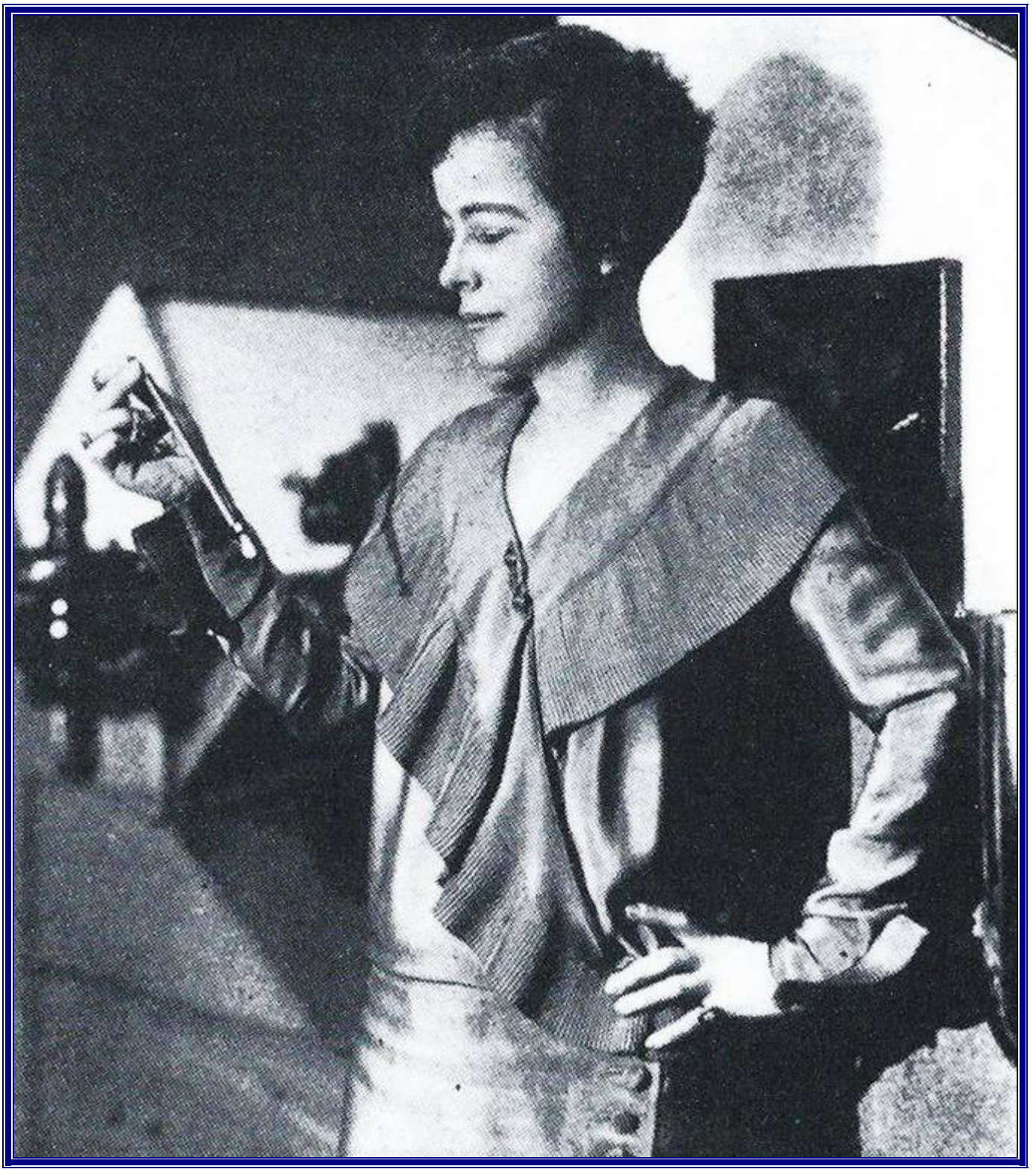
Margaret Ingels (right) with secretary Helen Cochran at the Research Bureau's first open day in October, 1926



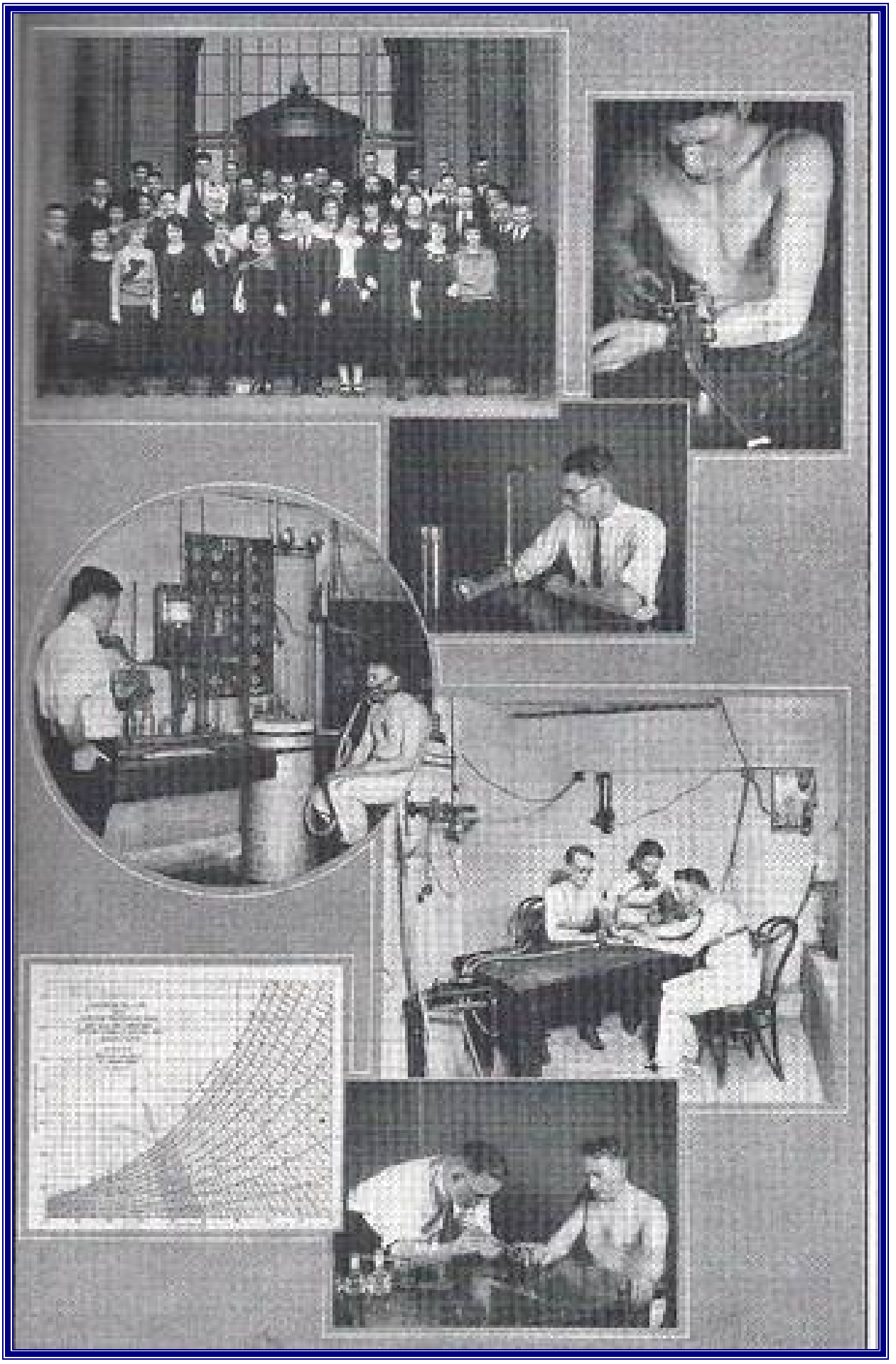
The ASHVE Research Bureau opened in 1919 within the Pittsburgh US Bureau of Mines Experimental Station. In 1944 it moved to temporary facilities in Cleveland before opening its own buildings (pictured) in 1946. The Bureau was closed in 1961.



In 1922, the ASHVE Research Laboratory published its Comfort Zone Chart



Margaret Ingels was a Staff Engineer at the ASHVE Research Bureau from 1921 to 1927



ASHVE Research Bureau comfort studies in 1931

Ingels left the Bureau in 1927 and rose to prominence in the industry with her later work in air conditioning as an associate of Willis Carrier. Recognising the increasing potential of small air-conditioning units, Carrier put "America's first woman air conditioning engineer" in charge of a campaign to educate the public as to the benefits of air conditioning.

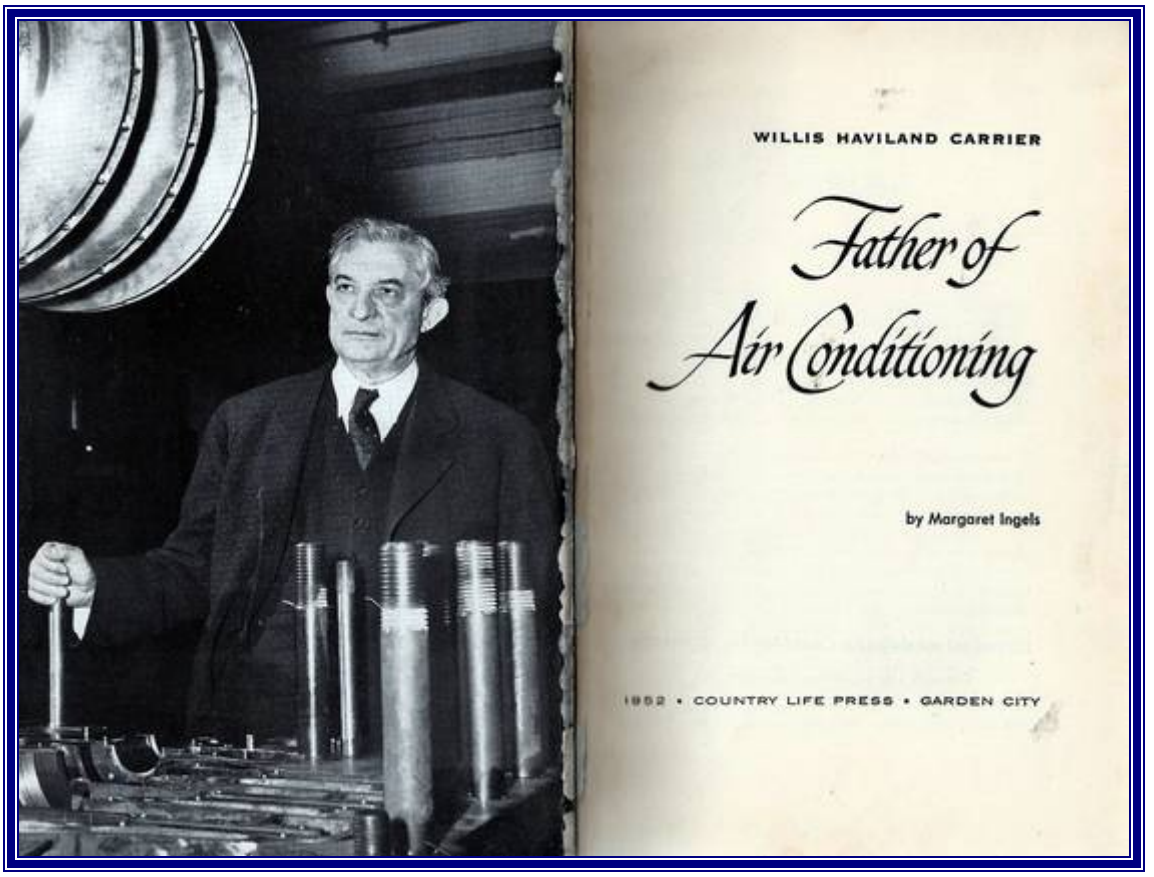
> *The decision by CEC (Carrier Engineering Corporation) to employ Margaret Ingels, a trained engineer, to promote comfort air conditioning among women's groups can be seen as one response to the perennial problem of educating away the conflict between engineers and such users.*

Ingels made some 200 speeches between 1932 and 1952, perhaps the most famous being her *Petticoats and Slide Rules* theme of 1952. She served as Librarian and Engineering Editor for the Carrier Corporation and prepared a 400-page document, now in the Cornell University Archives, on the life and achievements of Dr Willis Haviland Carrier. This manuscript, much reduced in size, was published in 1952 in the biography, which she authored, *Willis Haviland Carrier: Father of Air Conditioning.* She died in 1971.

Margaret Ingels was inducted into the ASHRAE Hall of Fame in 1996 at the Society's Annual Meeting in San Antonio, Texas, being described as:

> *……a woman who was a generation before her time.*
>
> *She became a great spokeswoman not only for Carrier but for the industry. She captured the interest of many young minds with demonstrations of refrigeration principles and her speeches inspired young people to enter the air conditioning and refrigeration fields. Ms Ingels was more than just a competent engineer, as her 45 technical publications in various journals attest. She developed the "effective temperature" scale to incorporate humidity and air movement in the equation for human comfort.*

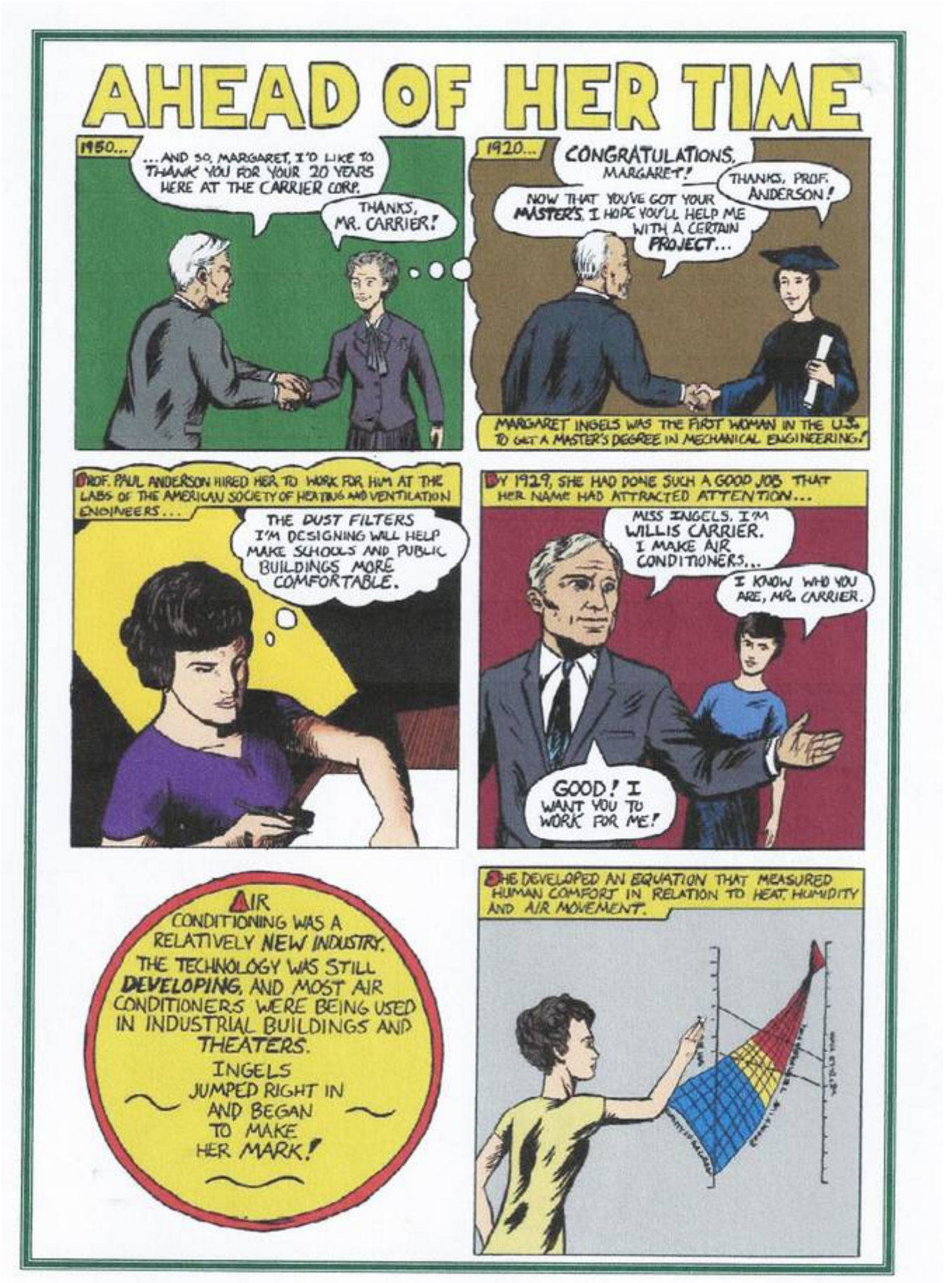
Margaret Ingels



Margaret Ingels' 1952 biography of Willis Carrier

Margaret Ingels with Willis Carrier

Appendix [*Ahead of Her Time:* A Tribute from the ASME]



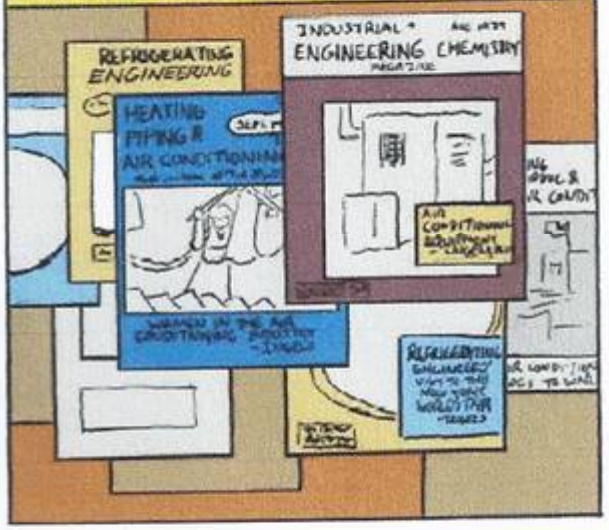
INGELS SOON BECAME AN EXPERT ON THE NEW AREA OF RESIDENTIAL AIR CONDITIONING, AND WENT AROUND THE COUNTRY DEMONSTRATING ITS BENEFITS.

IT'S 90 DEGREES OUTSIDE, BUT IT'S ONLY 67 IN HERE!

SHE ALSO SPOKE ON BEHALF OF THE CARRIER CORP. AND THE INDUSTRY IN GENERAL, TO ADULTS AND STUDENTS ENCOURAGING MANY TO PURSUE CAREERS AS ENGINEERS IN REFRIGERATION AND AIR CONDITIONING.

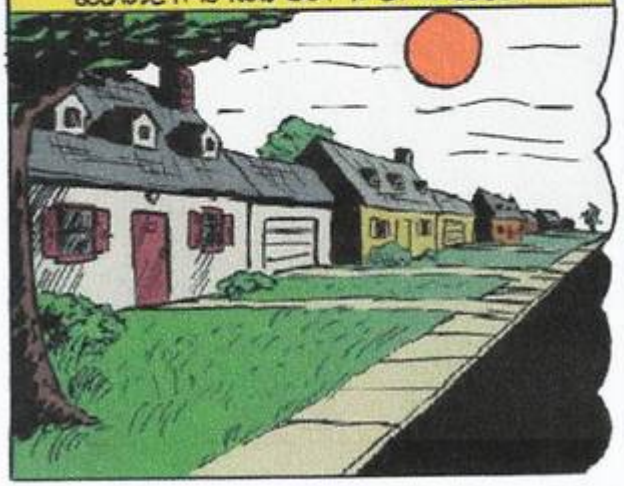
FROM 1932-1952, SHE GAVE MORE THAN 200 SPEECHES TO ABOUT 12,000 PEOPLE!

INGELS WAS A PROLIFIC AUTHOR, AS WELL, WRITING 45 PUBLISHED PAPERS ABOUT HER FIELD.



AS ONE OF THE FIRST MEMBERS OF THE SOCIETY FOR WOMEN ENGINEERS, SHE GAVE A SPEECH TO THE WESTERN SOCIETY OF ENGINEERS TITLED "PETTICOATS AND SLIDERULES," DESCRIBING WOMEN'S ROLES AS EARLY ENGINEERING PIONEERS.

BY THE 1950S, THE AIR CONDITIONING INDUSTRY, LARGELY THANKS TO INGELS, MADE IT POSSIBLE TO LIVE IN VERY WARM CLIMATES YEAR-ROUND. IN THE HOT SOUTHERN STATES, HOME GROWTH HAS NEARLY DOUBLED EACH DECADE BECAUSE IT IS NOW EASY TO STAY COOL.



1952

BY HER RETIREMENT IN 1952, MARGARET INGELS HAD PROVEN HERSELF TO BE A SOCIAL AND ENGINEERING TRAILBLAZER — AHEAD OF HER TIME!

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