

# Preface

This electronic book traces the history of man's attempts to control his environment from early times. Through the design of his buildings, harnessing the wind for natural ventilation, using natural ice for cooling, then from mid-Victorian times using mechanical ventilation and various means of cooling, until the introduction of comfort air conditioning with refrigeration at the start of the 20<sup>th</sup> century. The use of air conditioning for industrial purposes is another story.

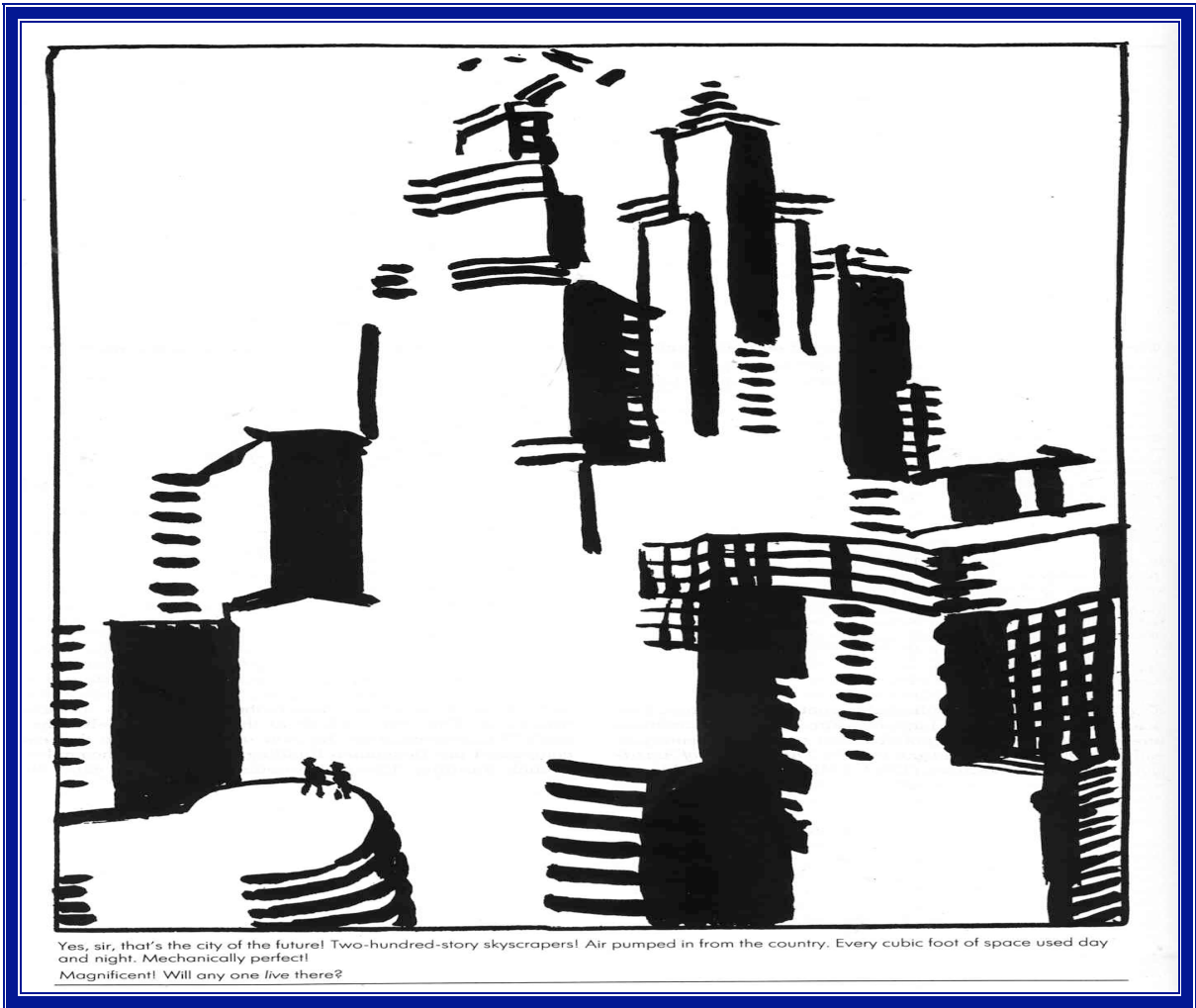
The first significant use of comfort air conditioning came about in cinemas in the 1920's with the introduction of the "talkies" and this continued up until the start of World War II. During this period only a handful of air conditioning installations for office buildings were carried out. Office air conditioning started to gather momentum after the war and had only any real impact in the 1970's due to the construction of taller buildings, lightweight curtain wall cladding with large areas of glazing, the adoption of increased lighting levels and the introduction of electrical office equipment.

Many early systems were of the low velocity type with zone re-heaters or air control damper arrangements. The space occupied by distribution ductwork became a serious problem, hence the introduction of high velocity all-air systems. But these often required significant electric power. To overcome this and meet the calls for individual room control the use of air-water systems using room fan-coil units or induction units became popular. By now a number of buildings started to have large internal zones where air-water systems were not always feasible. This led to the growing popularity of variable air volume (VAV) systems, but many suffered teething problems when the designers and operators failed to understand potential problems with part-load operation.

A sea change took place with the rising costs of energy and then concerns over CFC's and the ozone layer and now carbon dioxide emissions. Air conditioning and ventilation and the design of buildings are continuously evolving to meet these challenges.

Our story finishes at the start of the new Millennium.

**BMR Tadworth, 2009**



# *The Story of Comfort Air Conditioning*

**Eur Ing Brian Roberts CEng FCIBSE MASHRAE  
Chairman CIBSE Heritage Group**

**Yes sir, that's the city of the future! Two-hundred storey skyscrapers!  
Air pumped in from the country. Every cubic foot of space used day and night.  
Mechanically perfect! Magnificent! Will any one live there?**

*Lewis Mumford, 1929 [Caption to title illustration above]*

## The Author

Brian Roberts was born and educated in Bristol. He served a student apprenticeship with Brightside Heating & Engineering Company. Gained the Diploma and then the Associateship of the National College for Heating, Ventilating, Refrigeration & Fan Engineering. Worked for Brightside, London (Chief Air Conditioning Engineer), Drake & Scull (Company Chief Engineer) and Airpower, now Carrier Holland Heating, (Technical Director). Has served on technical committees of IHVE/CIBSE, HVRA/BSRIA, HVCA, BSI & ASHRAE. Has co-authored two books on air conditioning design and a history of building services, a history of hot water and the history of Haden Young. He also wrote the centenary books of the CIBSE and the HVCA as well as some 80 technical and heritage articles. He is Chairman of the CIBSE Heritage Group and has been responsible for many of the electronic books and features on the Heritage Group web site. Now retired his other interests include art, architecture and the history of the theatre. In 1994, he was awarded the CIBSE Silver Medal.

## Acknowledgments

This electronic book has been some ten years in its preparation and many people have helped with research and written contributions. I must thank members of the Heritage Group, both past and present, who have rendered invaluable assistance. In particular I must thank Paul Yunnie (past Vice-Chairman), Dr Neil Sturrock (present Vice-Chairman), Mike Barber (Hon. Secretary), Frank Ferris (Webmaster), John Barnes, Dr Geoff Brundrett, Neville Billington OBE (President IHVE 1971) and Stephen Loyd (formerly BSRIA Librarian). I must give very special thanks to Dr David Arnold (President CIBSE 1994) who started me off on this particular history with his two important papers\* for ASHRAE and who provided important information on a number of significant early air conditioning installations in the USA. I recommend that anyone interested in the history of comfort air conditioning should read his papers.

\* “The Evolution of Modern Office Buildings and Air Conditioning” (ASHRAE Journal, June 1999) and “Air Conditioning in Office Buildings After World War II” (ASHRAE Journal, July 1999).

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"I don't know why you don't have air conditioning like the other offices, Mr. Brandt!"