

REFERENCES

Abbreviations

Magazine and Journal titles are given throughout in italics

ASHRAE	American Society of Heating, Refrigerating & Air Conditioning Engineers (formed by merger of ASHVE & ASRE)
ASHVE	American Society of Heating & Ventilating Engineers
ASME	American Society of Mechanical Engineers
ASRE	American Society of Refrigerating Engineers
<i>BSEE</i>	<i>Building Services & Environmental Engineer</i>
CIBSE	Chartered Institution of Building Services Engineers (formed by merger of IHVE & IES -Illuminating Engineering Society)
CEC	Carrier Engineering Co Ltd, London
CHG	CIBSE Heritage Group (Collection)
IHVE	Institution of Heating & Ventilating Engineers
<i>JIHVE</i>	<i>Journal of the Institution of Heating & Ventilating Engineers</i>
u/d	undated
WHC	Dr Willis Haviland Carrier

CARRIER DOCUMENTS IN THE CIBSE HERITAGE GROUP COLLECTION

The majority of documents listed below were donated to the Collection by the late Archie Heard. Not all of those relating to Carrier USA are listed. A reference in the main text of, for example, [1/458] indicates the reference may be found under Heading [1] below, {Dr Willis Haviland Carrier, 1876-1950} and the three-digit number 458 that the document is {"Engineering Education," lecture notes by WHC, 5 July 1944}. The document references are listed in numerical order under each Heading. The additional number (s) and or letters after the document number are not given in the text reference, only below. They indicate the Collection File or Box Number, eg. 458-1 means document 458 is stored in File 1. Files 1 to 7 inclusive form the bulk of the Heard donation. Other codes, eg. A1, show another File location, in this case "Air Conditioning & Refrigeration-1". Documents in this latter category may start with an alphabetical code, eg. R81-12, the last item listed under Heading [3]. Such items are listed in alphabetical order after the numeric listing. Book and Photograph References in the main text do not have a Heading Number, but are listed at the end of this section.

References are grouped under the following Headings:

- [1] Dr Willis Haviland Carrier, 1876-1950
- [2] Dr Willis H Carrier, some early significant technical papers, 1911-30
- [3] Carrier Air Conditioning Company of America (Buffalo Forge), 1907-14
- [4] Carrier Engineering Corporation, USA, 1915-
- [5] Carrier Engineering Company, UK, 1921-1970
- [6] Carrier Engineering Company, catalogues/brochures, 1921-
- [7] Carrier Engineering Company, France, 1923-
- [8] Carrier Engineering Company, India, 1923-
- [9] Carrier-Ross Engineering Ltd, UK, 1929-
- [10] CEC, metal finishing, 1921- & Drysys Equipment, 1948-
- [11] CEC, marine air conditioning, 1930-
- [12] CEC, air conditioning systems & equipment, 1921-
- [13] Carrier USA & CEC, centrifugal refrigerating machines, 1921-
- [14] CEC, absorption refrigerating machines, 1950-
- [15] Stone-Carrier, train air conditioning, 1936-
- [16] Carlyle Air Conditioning & Refrigeration Ltd, UK, 1959-
- [17] G N Haden & Sons Ltd, UK, 1816 & Haden-Carrier, 1970-81

There are two further Reference Groups:

- Books: General Background
- Photographs in the CIBSE Heritage Group Collection

[1] Dr WILLIS HAVILAND CARRIER, 1876-1950

- 458-1 "Engineering Education," lecture notes by WHC, 5 July 1944.
- 461-1 "Comfort for Millions: A Far-Flung Romance," Don Wharton, *The Reader's Digest*, July 1950.
- 462-1 "The Thermal Engineer," WHC, reprint of Presidential Address to ASRE, December 1927.
- 463-1 "American Developments in Air Conditioning and Refrigeration during the War Period," Willis H Carrier, *The Engineers' Digest*, New York, December 1945.
- 466-1 "Willis Haviland Carrier: Father of the Air Conditioning Industry," (booklet) Leonard M Fanning, "Fathers of Industries Series," Mercer Pub. Co, New York, 1957.
- 470-1 "Dr Willis H Carrier: Father of Air Conditioning," Cloud Wampler, The Newcomen Society of England, American Branch, New York, 1949.
- 471-1 "Engineering Education: Principles v Curriculum in Memorizing Facts & Theories," W H Carrier, *Mechanical Engineering*, May 1937, 351-3.
- 472-1 "W H Carrier, a Teacher?" notes by E P Palmatier, 12 September 1952.
- 473-1 "Willis Haviland Carrier," a short biography, 19 July, 1937.
- 474-1 untitled, notes on WHC and his studies of psychrometrics, u/d, poss. c.1936.
- 475-1 WHC Record Cards : "Vital Statistics", Carrier Corp & at Cornell University.
- 476-1 Letter from J G Jackson to Margaret Ingels (WHC biographer), 8 February 1950, re WHC work for the High Altitude Wind Testing Tunnel, Cleveland, during WWII.
- 477-1 Inter-Office letter from Margaret Ingels, 13 February 1950, re 476.
- 479-1 Press Release re WHC, School of Engineering, Cornell University, u/d. with numerous photocopy documents & newspaper clippings from the Department of Manuscripts & University Archives, 101 Olin Library, Cornell University, Ithaca, New York, covering 1932-50.
- 480-1 "Cornell Engineers: Willis Carrier, '01 M.E.," *The Sibley Journal of Engineering*, February 1935, 29.
480a "Candidates for Alumni Trustees," magazine cutting, prob. *The Cornell Engineer*, u/d.
- 481-1 "American Developments in Air Conditioning & Refrigeration During the Last Decade," typescript of WHC notes, c.1945.
- 482-1 "Profiles of Outstanding Alumni, Dr Willis H Carrier, M.E, '01," *The Cornell Engineer*, Vol.10, No.8, 1945.
- 487-1 "Stories of Willis Haviland Carrier, Father of Air Conditioning," notes by J A E Heard.
487a A Poem, as a tribute to WHC, by Dr Albert Klein, Germany, 14 February 1947.
[duplicates at 904-A2 & 905-A2].
- 488-1 "Willis Haviland Carrier, 1876-1950," a tribute, *Fortune*, 23 March 1981, 109.
- 489-1 Letter from Matsujiro Nakagawa to J A E Heard, 1 December 1975 re 1929 Tokyo visit by WHC.
- 492-1 Letter from Walter Keser to J A E Heard, 20 April 1976 re meetings with WHC.
- 552-2 "Dr Willis H Carrier, 1876-1950," obituary, *ASHVE Transactions*.
- 578-4 "Dr Willis H Carrier: The Man and His Message," unpublished manuscript by J A E Heard, u/d.
- 698-A1 "The First 80 Years of Air Conditioning," Bernard A Nagengast, *ASHRAE Journal*, January 1992, S164-75.
- 701-A1 "The 1920s: The First Realization of Public Air Conditioning," Bernard A Nagengast, *ASHRAE Journal*, January 1993, S49-56.
- 704-A1 "HVAC&R Pioneers Inducted into The ASHRAE Hall of Fame," (includes WHC), *ASHRAE Journal*, September 1994, 10.
- 705-A1 "Recollections of Willis H Carrier," Carlyle M Ashley, *ASHRAE Journal*, October 1994, 50-54.
- 712-A1 "Air Conditioning & Dr Carrier," Ellen Kessler, *ASHRAE Journal*, July 1976 (2-pp, no numbers).
- 719-3 "Carrier -the Man and His Message," J A E Heard, *BSEE*, January 1980, 24-5.
- 720-3 "Carrier Worldwide," J A E Heard, *BSEE*, February 1980, 10-11.
- 721-3 "Carrier -on Educating Engineers," J A E Heard, *BSEE*, March 1980, 13.
- 722-3 "Carrier -the Early Years," J A E Heard, *BSEE*, December 1979, 27.
- 728/733-3 Various copy portraits of WHC.
- 735-3 "Benefiting Mankind," (reference to an Alistair Cooke broadcast), *Haden Insite*, 1981.
- 747-3 "Then And Now -The Birth of Air Conditioning," notes by J A E Heard, u/d.
- 896-A2 "The Father of Air Conditioning," J A E Heard, *Building Services Engineering* (CIBSE Journal), January 1977, A23.

[2] Dr WILLIS H CARRIER, some early significant technical papers, 1911-30

- 454-1 "The Contact-Mixture Analogy Applied to Heat Transfer with Mixtures of Air and Water Vapour," W H Carrier, *ASME Transactions*, PRO.59-2, 1937, 49-32
- 455-1 "A Review of Existing Psychrometric Data in Relation to Practical Engineering Problems," W H Carrier & C O Mackey, *ASME Transactions*, PRO.59-1, 1937, 33-47.
- 456-1 "Air Conditioning in the Printing and Lithographing Industry," Willis H Carrier & Robert T Williams, *ASME Transactions*, Vol.51, 1929, 19-30.
- 457-1 reprint of 469 in *Mechanical Engineering*, Chicago, May 1925.
- 464-1 "The Control of Humidity and Temperature as Applied to Manufacturing Processes and Human Comfort," Willis H Carrier, Paper No. 324, World Engineering Congress, Tokyo, 1929 (presented on behalf of a Committee of ASHVE).
- 468-1 "Rational Psychrometric Formulae," Willis H Carrier, reprint from *ASME Transactions*, 1911 [duplicate at 906-A2].
- 469-1 "The Temperatures of Evaporation of Water into Air," W H Carrier & Daniel C Lindsay, reprint *ASME Lecture*, 1-4 December 1924.
- 551-2 "Air Conditioning for Summer and Winter Comfort," W H Carrier, Historical Reprint of ASHVE paper of April 1930, *ASHRAE Journal*, May 1980, 42-3.
- 555-5 "Air Conditioning Apparatus," Willis H Carrier, reprint No.1341 ASME meeting, 1911.

[3] CARRIER AIR CONDITIONING COMPANY OF AMERICA, 1907-14

a subsidiary of Buffalo Forge Company

- 315-12 "Some Silk Mills," brochure, 1910.
- 316-12 "Mechanical Induced Draft," Buffalo Forge booklet, c.1899.
- BY42-46 "Mechanical Forged Draft," Buffalo Forge booklet, c.1900.
- R81-12 "Carrier Air Washers and Humidifiers," Catalogue 13, New York, 1913

[4] CARRIER ENGINEERING CORPORATION, USA, 1915-

- 460-1 *The Weather Vein*, "Organization Number, Vol.6, No.1, 1926.
- 467-1 "The Two Faces of Janus," (The Story of Carrier Corp), Syracuse, 1977.
- 558-5 3 postcards of Carrier HQ, Syracuse
- 564-4 "The Romance of Air Conditioning," Logan Lewis, c.1950.
- 565-4 "Carrier Corporation: Energy Ideas at Work," Annual Report Fiscal 1976, Syracuse, USA.
- 723-3 "Joel Irvine Lyle," papers and press cuttings from University of Kentucky.
- 725-3 "Building for a Bigger Boom," William Wingstedt, Appliance Manufacturer, January 1971.
- 726-3 "Logan Lewis," list of Carrier Publications donated to Cornell University.
- 727-3 "Carrier at the New York World's Fair," Carrier International News, January 1939, 7 (page 8 is "Gargantua the Gorilla sails to England in Carrier Air Conditioned Cage.")
- 736-3 "Carrier Products for Europe," *Refrigeration & Air Conditioning*, September 1979, 60.
- 737-3 *Carrier Courier*, July 1957 (feature article on training).
- 739-3 "Points re Carrier Arising from Discussion with Herman Seid," Notes by J A E Heard, 31 May 1978.
- [The CIBSE Heritage Group Collection also includes the following copies of *The Weather Vein*: May, 1921, June 1921, August 1921: October 1921, November 1921, February 1922, March/April 1922, June 1922.]

[5] CARRIER ENGINEERING COMPANY, UK, 1921-70

- 308-12 "First Principles of Manufactured Weather,"
- 485-6 "Oxford Corner House," notes on air conditioning (1926-7) recalled by Ernest H Barker, August 1977.
- 549-2 "Passive Defence & Collective Protection Against Gas Attack," notes by J A E Heard, u/d.
- 553-6 "A Personalised History of CEC, 1921-85," unpublished manuscript by J A E Heard, u/d
- 558-4 CEC nameplate "Air Conditioning and Drying Equipment."
- 577-4 "Looking Back Over 43 Years," unpublished manuscript by J A E Heard, u/d.
- 717 "Basic Design Calculations for Air Conditioning Projects in the 1920s by CEC," notes by J A E Heard, u/d, c.1980.
- 746-3 "Brief Outline of CEC Commercial Progress, 1921-75," notes by J A E Heard, u/d.

[6] CARRIER ENGINEERING COMPANY, catalogues/brochures

- 270-12 "The Carrier Humidifying System," Treatise No. 99, u/d (copy USA brochure 1920).
310-12 "Carrier Humidifying Apparatus and Control," Treatise No.100, u/d (copy USA brochure 1920).
311-12 "The Carrier Ejector System for Drying Finishes," Treatise No.112, u/d (copy USA brochure, c.1920).
326-12 "Carrier Centrifugal Refrigeration," u/d, c.1932.
401-12 "The Story of Manufactured Weather," book, reprint of *The Weather Vein*, March/April 1922.
494-1 "Carrier 50," an anniversary booklet for UK/France (in French & English), 1971.
495-1 "Air Conditioning for the Confectionery Manufacturer," u/d.
496-1 "Carrier Tobacco Ordering Machine," u/d.
497-1 "Carrier Incinerators," u/d.
498-1 "Noise, Smoke, Dust," (self-contained Weathermaker unit), u/d.
499-1 "Manufactured Weather Guarantees Uniform Temperature & Humidity," u/d.
500-1 "Introduction to the Carrier System of Air Conditioning to British Textile Mills," Treatise No.102, u/d (copy of USA brochure of 1920).
501-1 "Opening of the New Refuse Disposal Works, Manston Road, Margate,"(booklet), 26 July 1939.
502-1 "Abridged List of Principal Air Conditioned Installations in Public Buildings," & ".....Users of Carrier Industrial Air Conditioning," u/d, c.1938.
503-2 "The Official Opening of the New Refuse Disposal & Salvage Works, Guildford," Souvenir Brochure, 20 October, 1938.
506-2 "First Principles of Manufactured Weather," reprint of *The Weather Vein*, March & April 1922.
507-2 "The Carrier Psychrometric Chart, with Instructions for Its Use," u/d.
508-2 "Carrier Continuous Pressure Cooking Machine (for cans of any shape)," u/d.
509-2 "Manufactured Weather to make Every Day a Good Day," u/d.
510-2 "Carrier Dehumidifying Equipment," Treatise No. 300, u/d, (copy of USA brochure of 1920).
511-2 "Ventilation for the Modern Store," u/d.
562-4 "An Air Conditioning Achievement by Carrier (Broadcasting House)," CEC, u/d, c.1932
567-4 "Indoor Air by Carrier," brochure, u/d, c.1932.
568-4 "Carrier B-K Cold Diffusing System," CEC, London, u/d.
R36-12 "Air Conditioning for the Textile Industry," u/d.
---- "Carrier Weathermakers," u/d.

[7] CARRIER ENGINEERING COMPANY, FRANCE, 1923-

- 494-1 "Carrier 50," an anniversary booklet for UK/France (in French & English), 1971

[8] CARRIER ENGINEERING COMPANY, India, 1923-

- 486-6 Notes on Air Conditioning in India, by J A E Heard, u/d:
-1 "The Air Conditioning of Khasbagh Palace," (1931)
-2 "Air Conditioning in Northern India, 1925-35"
-3 *ibid*, "Equipment Data"
-4 "Basic Design Calculations for Air Conditioning Projects in the 1920s by CEC"
with assorted letters & drawings.
560-4 "Forty Years of Air Conditioning Progress," Volkart Bros (Carrier-advert & feature),
The Kaiser-I-Hind, newspaper supplement, Vol.LX, No.3097, Bombay, 18 May 1941.
572-4 "Metro Cinema," Inaugural Programme, 8 June 1938, Bombay.
573-4 "Carrier-Volkart," air conditioning advertisements *Times of India*, folder 22 April, 1941.
886-A2 "Air Conditioning In Northern India, 1925-35," notes by J A E Heard:
Typical Installations: Secretariat Buildings & Legislative Assembly, New Delhi
Regal Cinema, Lahore
Khasbagh Palace, Rampur
Lyallpur Cotton Mills
A-1 Drawings of Jodphur Palace (2), Lady Willingdon Hospital Jaipur (1), spray controls (2), c.1929.
B18-12 Drawing of Carrier Centrifugal Compressor, CEC, New Delhi, 1931.

[9] CARRIER-ROSS ENGINEERING LTD, UK, 1929-

- 542-2 "Carrier Ross Engineering, Marine Air Conditioning -Projects Completed (1960-85)".
- 561-4 "The Carrier York Heat Diffusing Unit," Carrier-Ross Eng Co, London, u/d.
- 574-4 "Ship Air Conditioning," unpublished manuscript by W R Hood, u/d.

[10] CEC, METAL FINISHING, 1921- & DRYSYS EQUIPMENT LTD, 1948-

- 504-2 "Industrial Paint Baking by Infra-Red Radiation," CEC, January 1943
- 505-2 "Rotodip", reprint from Industrial Finishing, CEC, u/d.
- 557-5 CEC Nameplate "Painting and Drying Equipment."
- 569-4 "Carrier Equipment for Bonderizing," CEC, London, u/d.
- 570-4 "Carrier is the Answer to Your Finishing Problems," u/d.
- 571-4 "New Paint Plant," (British Motor Corp, Cowley), reprint *Metal Finishing Journal*, November 1958.
- 575-4 "Paintpots to Robots," unpublished manuscript by J A E Heard.

[11] CEC: MARINE AIR CONDITIONING, 1930-

- 525-2 "Ships' Lungs," notes by J A E Heard 2-versions).
 - 526-3 *ibid*, printed version in Haden House Magazine.
 - 527-2 "Ships' Lungs (chronological table marine ventilation & air conditioning)," notes by J A E Heard, July 1977.
 - 528-2 "Notes on Marine Ventilation and Air Conditioning," W Hood, u/d.
 - 529-2 "Full Ahead for CAC Marine," Jack Baird, *Haden Carrier News*, October 1977.
 - 530-2 Letter re Marine Ventilation & Air Conditioning, 17 June 1975, by H(?) Peck.
 - 532-2 Drawing of Ventilation of Merchant Steamers, *Inst Naval Architects*, XXV, 1884.
 - 533-3 "Marine Air Conditioning," document list by J A E Heard, 21 June 1985.
 - 534-2 "Installations of Centrifugal Refrigerating Machines on Shipboard," Table 1 from *Heating, Piping and Air Conditioning*, c.1947.
 - 538-2 "Personal Notes by JAEH (marine air conditioning)," J A E Heard, u/d.
 - 539-2 "Launch of a Queen (QE2)," part i, notes by J A E Heard, u/d.
 - 540-2 *ibid*, part ii.
 - 541-2 "Carrier's War Effort," *Haden Insight*, c.1982.
 - 543-2 "Ships' Lungs No.2," further notes by J A E Heard, 21 June 1985.
 - 544-2 Extracts from a book "The Ventilation of Ships" by Windsor Engineering, with various CEC detail drawings, c.1970.
- R97-35-10 "Shaw Savill's New *Northern Star*," reprint from *Modern Refrigeration*, July 1962.

[The CIBSE Heritage Group Collection, File MA holds documents 167-185 relating to the history of marine heating, ventilating, air conditioning & refrigeration. The file also holds 361-380 which include design data and information on vacuum refrigerating (steam-jet) plant, including 1939 test data & drawings for that installed by Foster Wheeler on the RMS Queen Mary.]

[12] CEC: AIR CONDITIONING SYSTEMS & EQUIPMENT, 1921-

- 483-1 "Fresh, Uncontaminated Air in the Printshop," J A E Heard, *South African Printer*, July 1974, 4-5.
- 484-1 "Some Thoughts on Future Design Essentials for Air Conditioning Installations," J A E Heard, *South African Builder*, February 1974, 28-9
- 512-2 "The Pneumafil System," reprint from *Textile Weekly*, u/d.
- 580-5 "Air Conditioning of the BBC Television Centre," J A E Heard, *JIHVE*, February 1963, 377-93.
- 581-6 "Recent Developments in the Application of Refrigeration to Air Conditioning," J A E Heard & N F Bradshaw, reprint from *JIHVE*, February 1961.
- 582-6 "Selection of a Single-Duct Induction System on the Basis of Comparative Operating Costs," J A E Heard, N F Bradshaw & A J Keble White, *JIHVE*, October 1960, 238-250 & 353-61

- 724-3 "The Controlled Environment," W L McGrath, reprint *Phil. Trans R Soc, Lond*, 272, 603-609, 1972.
- 750-3 "Television Studios Create Development in Air Conditioning Distribution," draft of technical paper by J A E Heard, u/d.
- R36-12 "Air Conditioning for the Textile Industry," u/d (with pneumafil system)..
- R97-35 Folder of Carrier information, mainly project write-ups:
- 1 as 580-5 above
 - 2 "Air Conditioning in Hospitals," Donald A Goldfinch, reprint from *Official Architecture & Planning*, March 1966.
 - 3 "Air Conditioning and Ventilating at the New BBC Television Centre," reprint from *The Heating & Ventilating Engineer*, January 1961.
 - 4 "The BBC Television Centre," reprint from *Heating*, August 1960.
 - 5 "Air Conditioning at Birmingham Newspaper Headquarters," reprint from *The Steam & Heating Engineer*, May 1966.
 - 6 "Weathermaster Air Conditioning for the Co-operative Insurance Building, Manchester," reprint from *Heating*, September 1962,
 - 7 "High Velocity Air Conditioning for a London Office Building," reprint from *Heating*, August 1958.
 - 8 as 582-6 above
 - 9 as 581-6 above
 - 10 "Shaw Savill's New *Northern Star*," reprint from *Modern Refrigeration*, July 1962.
 - 11 "Air Conditioning at TI House, Birmingham," reprint from *Heating*, February 1961.
 - 12 List of Carrier "Weathermaster" Air Conditioning System Installations, 20 April 1967.
 - 13 "The Ariel Hotel, London Airport," reprint from *Heating*, February 1961.
 - 14 "Keeping Cool at the Pigalle (Theatre-Restaurant) in Piccadilly," reprint from *Heating & Air Conditioning*, u/d.
 - 15 "Air Conditioning for Hotels & Restaurants," brochure, u/d, c.1961.
 - 16 "Carrier -Thermal Engineers," product leaflet, u/d, c.1960.
 - 17 "Carrier Cleanair Cabinet," product leaflet, u/d, c.1960.
 - 18 "Applying Gas to Air Conditioning," J D P Broadbent, reprint from *Gas in Industry*, 5 October 1966.

[15] CARRIER USA & CEC: CENTRIFUGAL REFRIGERATING MACHINE, 1921-

- 326-12 "Carrier Centrifugal Refrigeration," u/d, c.1932.
- 453-1 "Centrifugal Compression as Applied to Refrigeration," W H Carrier, reprint from *Refrigerating Engineering*, ASRE, February 1926
- 459-1 "The Invention of the Centrifugal Refrigerating Machine," script for a Smithsonian Institution tape recording, Logan Lewis, 1 March 1962. [duplicate at 895-A2].
- 465-1 "Comparison of Thermodynamic Characteristics of Various Refrigerating Fluids," W H Carrier & R W Waterfill, reprint *Refrigerating Engineering*, ASRE, June 1924.
- 478-1 Copy of letter from W H Carrier to Dr Klein re past associations, 17 April 1947.
- 490-1 "List of Carrier Centrifugals in the UK," (about 1926-31), compiled by J A E Heard.
- 559-5 Handwritten Carrier Centrifugal Compressor calculations, 30 March-4 May 1946.
- 748-3 "First Centrifugal Air Conditioning Compressor to Enter Museum (Smithsonian)," source unknown, c.1961
- 900-A2 "A History of the Centrifugal Refrigerating Machine," Walter A Grant, *Refrigerating Engineering*, ASRE, February 1942, 82-6.
- 900-A2 "Centrifugal Refrigeration as Applied to Refrigeration," W H Carrier, *Refrigerating Engineering*, ASRE, February 1926, 253-68 & 77.
- B18-12 Drawing of Carrier Centrifugal Compressor, CEC, New Delhi, 1931.

[16] CEC: ABSORPTION REFRIGERATING MACHINE, 1950-

- 550-2 "Carrier Absorption Refrigeration Machine," notes by J A E Heard, u/d.
- 628-7 "History of the Development of the Carrier Absorption Refrigerating Machine in the UK by CEC," an album of photographs (listed in following section) & notes by J A E Heard, 21 June 1985:
- 633 "Personal Recollections"
 - 640 "Carrier Absorption Machine"
 - 641 "A New Development in Absorption Refrigeration," A A Berestneff (Carrier, USA), reprint from *Refrigerating Engineering*, June 1949.
 - 642 "Combination Centrifugal/Absorption Cooling May Save Dollars," Victor Chun, *Heating, Piping & Air Conditioning*, March 1961, 108-9
 - 643 "Preliminary Information on the Absorption Machine", typescript CEC Library, 6 December, 1946
 - 644 "CEC: Absorption Refrigeration Machines Manufactured in Britain," list 1950-76.
- B99-12 "Carrier Automatic Hermetic Absorption Refrigeration," CEC catalogue, u/d.

[19] STONE-CARRIER: TRAIN AIR CONDITIONING, 1936-

- 513-2 "Train Air Conditioning," notes by J A E Heard, u/d.
- 514-2 "Air Conditioned Carriages of the North Western Railway (India)," printed lecture given by R H Schuepp, Lahore, 28 March 1940.
- 515-2 "Stone's of Deptford," printed extract "From Nails to Propellers," E C Osborn, *PLA Monthly*, u/d.
- 516-2 "The Development of Railway Air Conditioning," A H Clinton, *Stone's Quarterley*, Spring 1951.
- 518-2 "Co-operation in Sales," W J Ruston, prob. *Stone's Quarterley*, u/d.
- 519-2 "Air Conditioned Rail Travel in Australia," *Stone's Quarterley*, c.1957.
- 520-2 "India's New Fully Air Conditioned Trains," *Stone's Quarterley*, 1957.
- 521-2 "The Egyptian Royal Train," C P Hall, *Stone's Quarterley*, c.1951.
- 522-2 "Air Conditioning for the Emperor (Ethiopia)," J K Bridcut, *Stone's Quarterley*, poss. 1956.
- 523-2 "One for the Road," (motor coaches), *Stone's Quarterley*, u/d.

[20] CARLYLE AIR CONDITIONING & REFRIGERATION LTD, UK, 1959-

- BL49-32 "Air Conditioning System Design Manual," London, 1962.
- BL50-32 "Conduit Inductionaire System Design Manual," London, 1963
- 32 "The Design & Application of VAV Systems," reprint from *The Heating & Air Conditioning Journal*, March-August, 1978, issued by Ductwork Engineering Systems Ltd (Carlyle Distributor).

[21] G N HADEN & SONS LTD, 1816- & HADEN-CARRIER, 1970-81

- 98-15 "Haden: A Short History of the Company, 1816-1991," Haden, London, 1991.
- 524-2 "Diary of A Take-Over (1970)," notes by J A E Heard.
- 1225-12 "Haden 150 Years," Haden, London, 1966.

[12] BOOKS: GENERAL BACKGROUND

- AVB "Air Conditioning & Ventilation of Buildings," D J Croome-Gale & B M Roberts, Pergamon Press, Oxford, 1975.
- BSE "Building Services Engineering: A Review of Its Development," N S Billington & B M Roberts
- CM "The Comfort Makers," Brian Roberts, ASHRAE, Atlanta, 2001.
- FAC "Father of Air Conditioning: Willis Haviland Carrier," Margaret Ingels, Country Life Press, Garden City, 1952. [Recent reprinted versions omit the useful "Chronological Tables".]
- FCA "The First Century of Air Conditioning," Harry M Will (Editor), ASHRAE, Atlanta, 1999.
- FE "Fan Engineering," Willis H Carrier, Buffalo Forge Company, Buffalo, NY, 1st edition, 1914.
- HAC "Heat & Cold: Mastering the Great Indoors," Barry Donaldson & Bernard Nagengast, ASHRAE, Atlanta, 1994.
- HBA "Handbook of Air Conditioning System Design," Carrier Air Conditioning Company, McGraw-Hill, New York, 1965.
- MAC "Modern Air Conditioning, Heating & Ventilating," Willis H Carrier, Realto E Cherne & Walter A Grant, Pitman, New York, 1st edition, 1940.
- PTT "Proclaiming the Truth," (History of ASHRAE 1894-1994), ASHRAE, Atlanta, 1995.
- QC "The Quest for Comfort," Brian Roberts (for CIBSE Centenary), IMI/Andrews, 1997.

PHOTOGRAPHS IN THE CIBSE HERITAGE GROUP COLLECTION

The Collection also contains photographs (File-7) relating to Carrier Engineering Corp, USA. These are not listed below, unless featured in this book..

- 601 Air Conditioning Plant serving the Oxford Street Corner House, London.
- 602 *ibid*, Refrigeration Machine.
- 603 *ibid*, Washer Detail.
- 604-27 Album of photographs of the air conditioning at the BBC, Portland Place, London, 1931.
- 628 *see References*. Album of photographs 628-9 & 630-1, 2, & 4-9 of CEC absorption refrigerating machines.
- 651 Wrigley Factory, London
- 655 Air Conditioning Plant serving the Cambridge Theatre, London.
- 656 Marine Air Conditioning Plant, SS "Victoria," 1930
- 657 SS "Victoria," Dining Room, 1930
- 658 RMS "QE2", December 1968.
- 659 Carrier Engineering Corp, Training Class, September 1929.
- 664 BBC Television Centre, White City, Studio 3, 1960.
- 665 CEC, Acton. Experimental Hydrospin Spraybooth
- 667 Refrigeration for Air Conditioning serving the Bengal Council Chamber, Calcutta.
- 668 Air Conditioning Plant serving Bengal Council Chamber, Calcutta.

The following photographs are referenced by CEC Technical Records Numbers

- 003974 Carrier Factory, Wembley, 1957.
- 004230 Drawing Office, Carrier, Wembley.



*Demonstration Air Raid Shelter for 10 people, 1937,
with CEC gas defence filtered ventilation system
installed at 24 Buckingham Gate, London.
[HVE, October 1937, 187].*



Carrier

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Carrier Weathermakers Ltd, catalogue cover, c.1938 [6/498].