BUILDING SERVICES centenary supplement

1897

100 years of building services

1997

and beyond...

THE INSTITUTION of HEATING and VENTILATING ENGINEERS.

(INCORPORATED)

25 AND 26 VIC. C. 89, S. 10.

29, LUDGATE HILL,

LONDON, E.C.,

December, 1897.

DEAR SIR,

I am requested to hand you herewith particulars of this Institution, with the anticipation that the objects set out will secure your co-operation and support.

There are perhaps no subjects upon which so much has been written, nor individual labour bestowed, as those of Heating and Ventilating, two closely allied sciences which are daily assuming greater importance. Every person engaged in the profession is like any other scientist—necessarily a student. For his own advantage he must be a keen observer, and make careful inspection and copious notes from which to gain knowledge for future experiments. In this way an amount of information has been gained, but, notwithstanding the importance of the matter, it is one to which not enough **organised** study has been given.

So little attention has hitherto been given to the science, that while almost every profession has its Society or Institute, and will bear testimony to the value accruing from such, Heating and Ventilating Engineers in Britain are practically an unorganised body. We say *Britain* advisedly, for the reason that the Americans and Canadians, with their powerful Institution have raised public opinion and brought the science to a high state of efficiency, contrasting more than favourably with this side of the water, where to the public the science of Heating is almost unknown, and Ventilation exists largely in the imagination.

This being the first serious attempt to organise the profession, the Governing Body fully anticipate receiving your support.

Negotiations have been completed with the proprietors of "Domestic Engineering" whereby that Journal becomes the official organ of the Institution, and in which will be published reports of our lectures, essays, transactions, experiments, and other proceedings, it being also intended to illustrate and describe therein works executed by members, the plans of which could be deposited at the Office of the Institution. The Journal is issued monthly, and a copy will be sent to every Member and Associate of the Institution, **without charge.**

All Applications for Membership should be accompanied by a letter stating in detail the qualifications of the Applicant, what certificates are held (if any), number of years in practice, if any important works executed, and other particulars.

I may add that any applicant applying on the enclosed Form on or before Saturday, the 11th inst., will, if admitted, not be required to pay their first year's subscription until the 1st of next January.

Yours faithfully,

LUWEE HARRIS,

Secretary

1897 Pioneers herald

1897 The Institution of Heating and Ventilating Engineers founded, largely on initiative of Edmund William Mayner, now regarded as father of the IHVE. First prospectus issued. Queen Victoria celebrates diamond jubilee. First push button electric lifts being manufactured by Pickerings Lifts, Stockton-on-Tees (1).

1898 John Grundy, a boiler manufacturer from Islington, elected first IHVE president. IHVE autumn meeting held at the Albion Hotel, Ludgate Circus. *Ironmonger* journal comments: "The absence of heat in the discussion and ventilation in the apartment struck me as being rather curious." The American Society of Heating & Ventilating Engineers summer meeting is held at Sarasota Springs. Britain's first escalator, an inclined travelator (by Piat et ses Fils), installed at Harrods. (2) Early h&v advertising in *The Builder*

1899 One of the first IHVE technical papers: *Heating surface: its best form and relation to radiating surface*, by John Kitchen (Mather & Kitchen). IHVE first summer meeting at Stourbridge, hosted by president Walter Jones (Jones & Attwood).

1900 IHVE papers: *Boilers for low pressure hot water heating*, by Sam Naylor (Lumby, Son & Wood) and *Standardisation of flanges*, by RE Atkinson. Publication of *The plumber & sanitary houses*, by SS Hellyer. Samuel Cleland Davidson of Belfast designs a combination washer and filter apparatus including ice for cooling air in summer. Davidson patents the sirocco centrifugal fan.

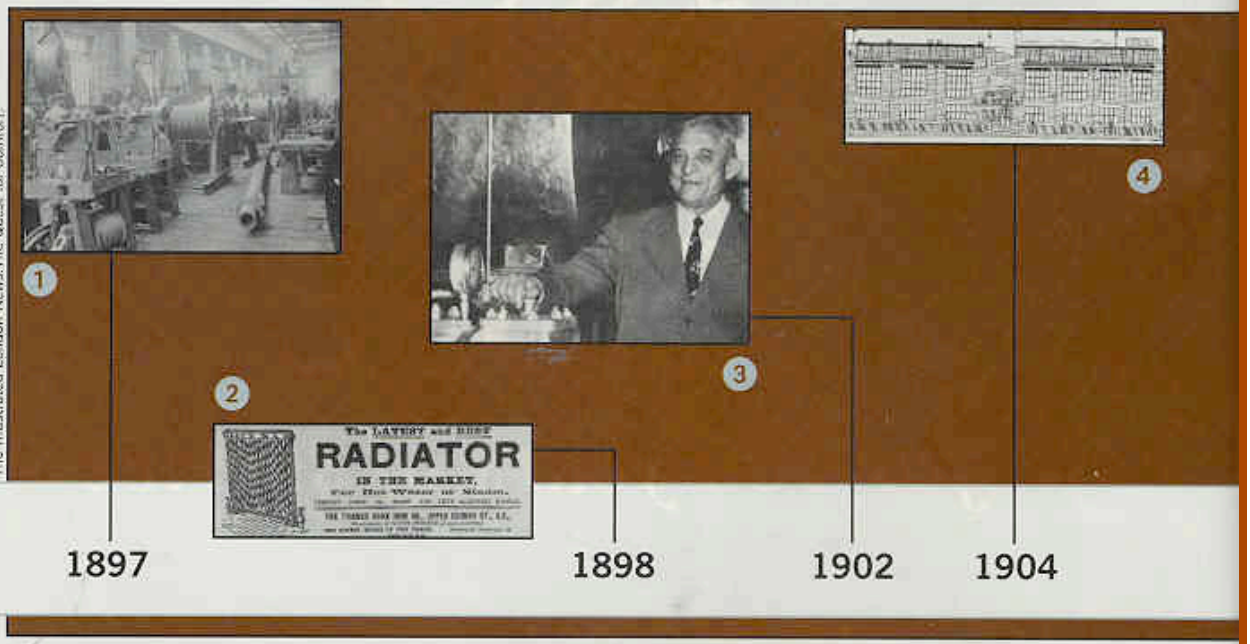
1901 Death of Queen Victoria.

1902 Sam Naylor awarded first IHVE silver medal, Walter Yates (Matthew & Yates) first IHVE bronze medal. Willis Carrier (3) designs air conditioning system for Sackett-Wilhelms Printing Co, New York. Alfred Wolff designs cooling system for New York Stock Exchange.

1903 Sir Louis F Pearson CBE (Beeston Foundry) elected sixth president IHVE; summer meeting at Nottingham. Opening of the Royal Victoria Hospital, Belfast with the air treatment systems designed by Henry Lea and incorporating a fresh air water sprinkler system, regulated by wet and dry bulb temperatures, to control humidity.

1904 Formation of the Heating & Ventilating Contractors' Association with David Nesbit as president. American Society of Refrigerating Engineers founded with John E Starr elected president. Publication of *Heating by hot water* (3rd edition), classic book by Walter Jones. First phase of the Glasgow School of Art (architect Charles Rennie Mackintosh) completed, with air treatment plant designed by Wm Key including ice-block cooling and water sprays for humidity control (4).

1906 W Nelson Haden elected ninth IHVE president. IHVE papers: *The labour problem*, by FS Russell and *Air analysis*, by J Roger Preston. IHVE annual dinner held at the Hotel Russell in London (ladies specially invited); cost six shillings per head, evening dress optional. Stuart Cramer of North Carolina coins term 'air conditioning'. Willis Carrier introduces dew-point method of air conditioning control. Pearson patents bimetallic-strip type fire detector designed by Alfred McNeil. Completion of Prudential Assurance Building in High Holborn (architect Alfred Waterhouse) with an early, significant combined heat and power installation designed by Wilson



a new era 1919

Phipson. Pictured (5) is a fire during extension work in 1932. Water hoses reportedly caused more damage than the fire itself.

1907 Death of Lord Kelvin who first suggested heat pump (1852).

1908 IHVE paper: *Boiler efficiency*, by Walter Jones. Leon Gaster founds *Illuminating Engineer* (6). Paris hosts first international congress of refrigeration. Edward Comfort patents humidity regulator for Warren Webster Co. Thermotank Co installs elaborate h&v systems on liners Lusitania and Mauretania. First Ford Model T rolls off the production line (in black).

1909 The Illuminating Engineering Society formed due to efforts of Leon Gaster who becomes Hon Secretary. Silvanus Thompson FRS elected as first president IES. Sir Joseph Swan (7), who independently developed a practical incandescent lamp in the same year as Edison (1879), elected Hon Fellow IES. In the USA, CO_2 refrigerating plant is added to ventilation system of Larkin Building, Buffalo (architect Frank Lloyd Wright) making it possibly the world's first air conditioned office building.

1910 C Ingham Haden elected 12th IHVE president; summer meeting in Bournemouth. Sebastian de Ferranti elected president of the Institution of Electrical Engineers. Deaths of Florence Nightingale, a passionate advocate of natural ventilation in hospitals, and Edward VII.

1911 IHVE paper: *Centrifugal fan testing*, by GL Copping. Willis Carrier presents his *Rational psychometric formulae*. Mass production of the GEC Audiffren SO_2 household refrigerator by GEC. In the USA, Coolidge introduces the tungsten filament lamp.

1912 First IHVE gold medal awarded to C Knuth. AH Barker's classic textbook, *Barker on heating*, is published. Theory of axial flow fans advanced by N Joukovsky at Society of Mathematics, Moscow. Death of Henry Lea. SS Titanic sinks on maiden voyage.

1914 First World War begins. IHVE paper: *Physiological aspects of ventilation*, by Sir Leonard Hill (elected Hon Fellow IHVE in 1915). IHVE moves offices to High Holborn. Sir William Bennett KCVO elected second IES president. Thomas Alva Edison elected Hon Fellow IES. Death of Joseph Swan.

1915 Eugeen Milener of Baltimore applies the degree day concept to heating fuel consumption calculations. Energy efficiency already (8) - production of a half-Watt lamp (formerly full-Watt consumption lamp) shown at Philips Lighting.

1916 Margaret Ingels becomes possibly first woman to earn a degree in mechanical engineering, goes on to write Willis Carrier's biography: *Father of air conditioning*.

1917 Alexander Pelham Trotter elected third IES president.

1918 First World War comes to an end as the Armistice is signed.

1919 Report of the IHVE fuel economy committee issued. IHVE paper: *Air interchange and heat loss from buildings*, by WW Nobbs. The American Society of Heating and Ventilating Engineers establishes its research laboratory. The era of comfort air conditioning begins with an installation at the Balaban & Katz Central Park Theatre, Chicago.

Research and words by Brian Roberts, CIBSE Heritage Group.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1906 1908 1909 1915

1920 Services between

1920 The IHVE introduces its first set of entrance examinations. The Philips Co of Holland develops the prototype gas discharge lamp. Meanwhile, the government announces plans to build 100 000 new homes in the coming year.

1921 Unemployment in the UK tops two million. The IHVE completes experimental work on heat transmission through heavy building materials used in wall construction: thermal mass is on the agenda. Revolutionary charts are produced by Konrad Meier, for use in the design of h&v systems. The Building Research Station (later the Building Research Establishment) is set up (1). Albert Einstein receives the Nobel Prize.

1922 IHVE establishes a central library in London and a publicity and fan standardisation committee. The American Society of Heating and Ventilating Engineers (ASHVE) publishes its first *Guide*, while Willis Haviland Carrier demonstrates the first centrifugal water chiller (2). Graumans Metropolitan Theatre opens in Los Angeles, air conditioned using the first down-draught bypass air distribution system developed by Logan Lewis. RIBA says maximum building heights in the UK will not be changed from 80 to 100 feet as claimed in the media.

1923 Gustave Eiffel, who designed and built the Eiffel Tower in 1889, dies at the age of 91.

1924 March sees the launch of Britain's inaugural national airline, dubbed Imperial Airways. The threat of low pay and the use of unskilled men to build homes brings about the first nationwide building strike. A proposed Channel Tunnel is rejected.

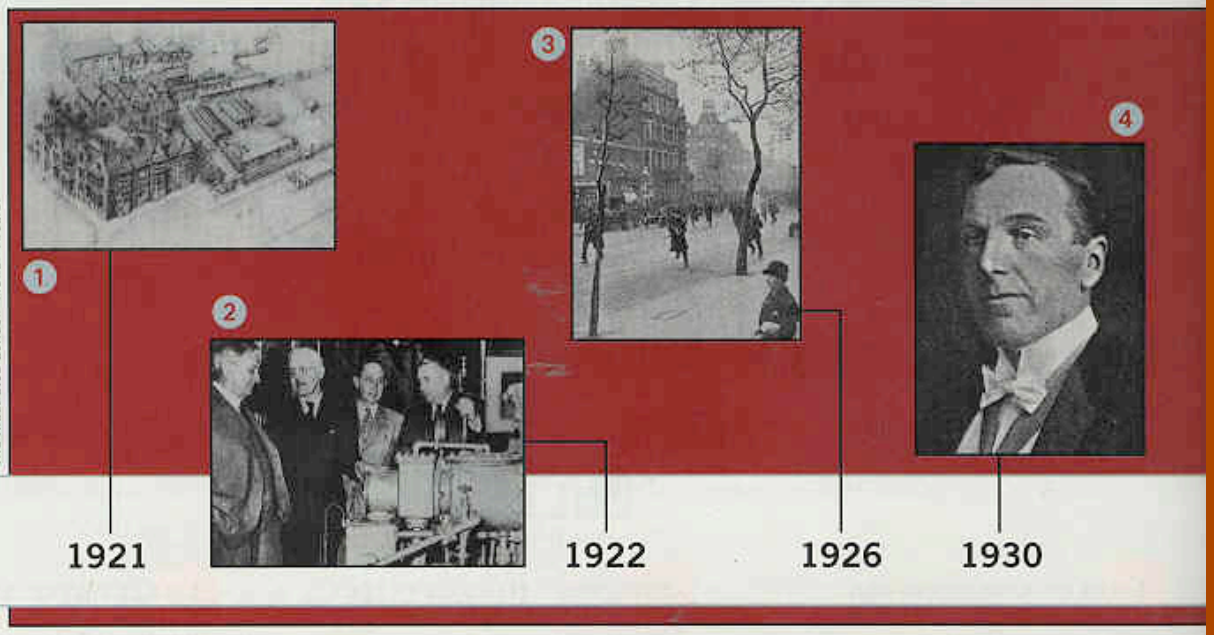
1925 Silica gel is used for the first time for dehumidification in air conditioning applications. Joseph Meech pens the first article on the application and design of electric motors for h&v installations.

1926 G C Pillinger & Co supplies its patented Bruston auto-pneumatic water supply system to the Rural Districts Water Co of Princes Risborough, the first public water supply company in the UK to install automatic pumping plant. Moving pictures transmitted by wireless are demonstrated for the first time by inventor John Logie Baird. As the economy continues to decline the TUC calls the General Strike (3).

1927 November sees the installation of the UK's very first automatic telephone exchange at Holborn, London. Prime Minister Baldwin announces that women over the age of 21 will be given the vote.

1928 The IHVE sets up an associate members and graduates section. An IHVE representative is appointed to the board at the Building Research Station. The year sees the death of Leon Gaster, founder of the Illuminating Engineering Society. In the USA, the first television set goes on sale for $75. Professor Alexander Fleming discovers penicilin.

1929 J Roger Preston serves his term of office as president of the IHVE. Willis Carrier patents the induction unit with ejector nozzles as GEC introduces the first water-cooled room air conditioner, which uses SO_2 as its refrigerant. The first meeting takes place between the presidents of the IHVE and the ASHVE. The year sees the Wall Street Crash.



Mary Evans Picture Library, The Quest for Comfort, The Illustrated London News, Arcaid.

the wars 1939

1930 Dr Thomas Midgley Jr of EI Du Pont de Nemours introduces the Freon-12 refrigerant for commercial use. At an IHVE sessional meeting in London on 5 November, T Haldane offers the first exposition on the heat pump and its application to heating. Half a century of boiler making is celebrated in a paper by Sam Fox, soon to be elected IHVE president. A H Barker (4) presents a paper on the calculation of low temperature radiant heating systems.

1931 Axial flow fans, developed as part of aeronautical research, are adapted for use in the ventilating market. President Hoover opens the Empire State Building (5), the world's tallest structure. Inventor Thomas Alva Edison dies in New Jersey, aged 84. The BBC opens its new hq in London's Portland Place (6). Chilled water for air conditioning is generated by a Carrier centrifugal refrigeration machine.

1932 The height of the Depression, 27·3% of the construction industry's employees are out of work and RIBA president Raymond Unwin pleads for anyone earning more than £250 per year to donate 1s 7d each week to the Architects' Unemployment Fund.

1933 The *IHVE Journal* goes monthly for the first time, edited by Alcwyn Jones until his death in 1954. The *Journal* was to be largely self-supporting thanks to the inclusion of commercial advertising.

1934 A building boom - 190 000 homes had been built in a decade - coincides with an upturn in IHVE membership, with an increase from 545 in 1926 to 914. The principles of heating and ventilation are discussed in a seminal book by Dr H Vernon.

1935 Gaylord W Penney of Westinghouse, Pittsburgh invents the electrostatic precipitator for air filtration. Under W E Fretwell's presidency the IHVE establishes a Benevolent Fund. R Crittall & Co installs a pioneering embedded pipe cooling system at ICI House, London. A method of detecting aeroplanes by reflecting radio waves off them is patented by Robert Watson Watt.

1936 *The heating and air conditioning of buildings*, a pivotal text, is written by Oscar Faber and J R Kell. The Illuminating Engineering Society issues the first version of its code *Recommended values of illumination.*

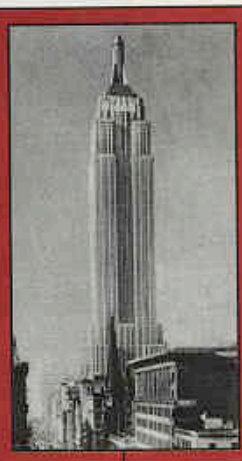
Unrest in the north east leads to the Jarrow marches. The Building Services Association is formed. In November a fire destroys the Crystal Palace, designed by Sir Joseph Paxton. Edward VIII abdicates.

1937 IHVE president C Allenby states in his inaugural address that, from 1934-1937, 800 inventions had been patented bearing some relation to central heating, hot water supply and ventilation. Sadly, Allenby later dies in a train crash en route to an IHVE regional meeting. The first steel radiators are invented and the National Housebuilders' Registration Council is formed. Contemporary office layouts are well illustrated in an advertisement in *The Builder* (7).

1938 A paper by Oscar Faber and J R Kell examines the ventilation for Earls Court, the largest UK building under one roof by volume and area (50 million ft³, 12 acres).

1939 Germany and the Soviet Union invade Poland, war is declared on Germany by France and Britain.

Research and words by Brian Sims, **Building Services Journal.**



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1931

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1931

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1937

1940 Home fires just

1940 As the Battle of Britain rages overhead, the IHVE decides to move to safer premises. The Secretary resigns and Council decides not to replace him *sine die*. IHVE Council elections are cancelled. The fluorescent lamp comes into general use in offices and industry. The first edition of the IHVE *Guide* is published. *Gone with the wind* has its British premiere. The Thames freezes over for the first time since 1888.

1941 The RAF reveals that it has been using 'radiolocation'. Japan bombs Pearl Harbour and the USA enters the war. Papers are presented at the IHVE on air raid shelter ventilation and waste products as fuel. A quarter of the binders for the forthcoming code of practice, otherwise referred to as the *Data book*, are destroyed by fire at the printer, delaying publication. Income tax reaches 50%. The IHVE has 1219 members.

1942 The *Beveridge report* is published, proposing the Welfare State. Magnetic tape recording is invented. The new Waterloo Bridge, London is completed. Oxfam is formed. The IHVE awards its gold medal to William Haden and begins publishing a *Personal and social supplement* containing news of members, particularly from the front. Hygrometric tables are published.

1943 The Dambuster raid destroys two Ruhr dams (the model used for experiments is still at BRE, Garston). PAYE tax is proposed but opposed by the BMA and the insurers. The *IHVE Journal* is much thinner, with a call for members to submit more papers.

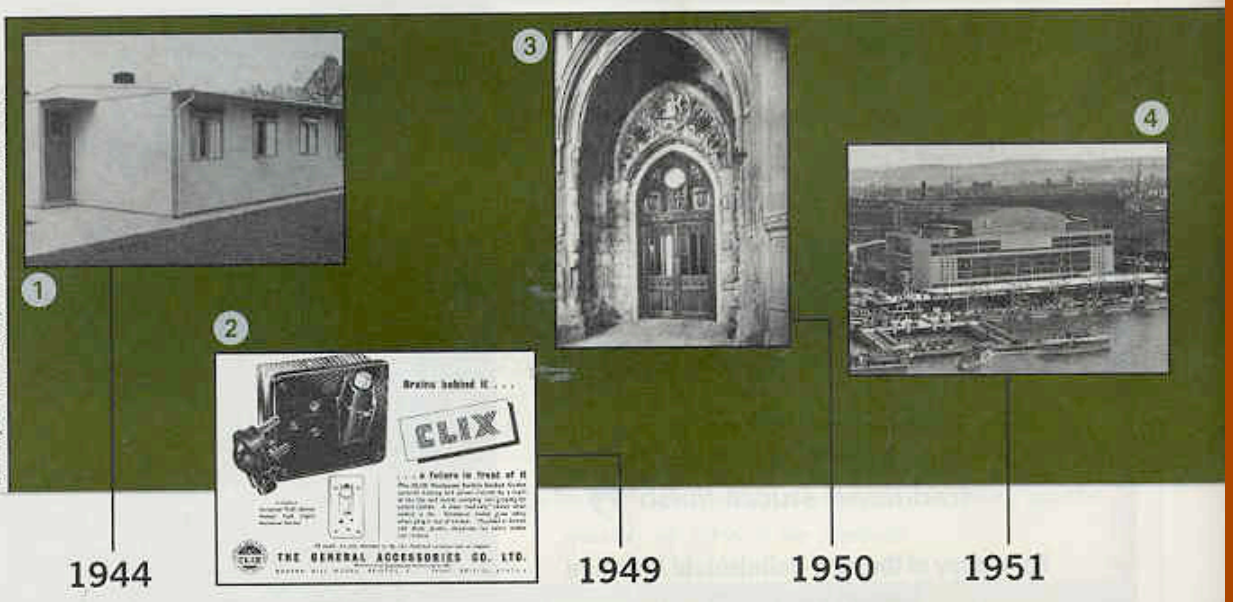
1944 The first prefabs (1) go on show. Lloyd George retires. The IHVE considers moving back to 22 Russell Street but both it and its temporary home are bombed, forcing a move to Victoria Street. Oscar Faber takes over as president as pressure of war work forces several officers to resign.

1945 The United Nations Organisation, the International Monetary Fund and the World Bank are formed. Germany surrenders to the Allies, Japan surrenders later after two atomic bombs are dropped on Hiroshima and Nagasaki. The first full time heating and ventilating course starts at the Borough Polytechnic. The *Journal* contains a big debate on whether unit heaters are healthy. Mies van der Rohe designs the Farnsworth House. The IHVE has 1363 members, numbers having increased every year through the war.

1946 Silkin announces plans for 20 new towns. IBM announces the ENIAC, a calculating machine with a memory (using valves). John Logie Baird dies. The Biro is launched. The IHVE appoints a new secretary and moves to Eaton Place. The last issue of the *Personal and social supplement* appears after a survey shows that members no longer feel it necessary.

1947 The coal industry is nationalised. There is a transport strike and fuel shortages during a very severe winter when temperatures reach -16°F. Harwell nuclear power station opens and the Americans break the sound barrier.

1948 The Russians blockade Berlin. The railways and electricity companies are nationalised. Ghandi is assassinated. The transistor is invented and the first operations on heart valves take place. The general Certificate of Education is unveiled and criticised as



Barnaby's Picture Library, The London Illustrated News

keep burning 1959

being too difficult. Comprehensive schools are announced. IHVE membership reaches 1571.

1949 The communists take power in China. The North Atlantic Treaty Organisation is formed. The pound is devalued by 30%. Einstein publishes a generalised theory of gravitation. The ban on neon, floodlighting and coloured lighting is lifted. Some electrical companies (2) can now claim more than half a century in business.

1950 Sainsbury's opens its first self-service store. Air conditioning is installed at the House of Commons (3) when it is rebuilt following bombing. A study shows that only 46% of UK households have a bathroom.

1951 The iron and steel industries are nationalised (and denationalised in 1953). Burgess and Maclean defect. Pimlico district heating scheme is inaugurated and the foundation stone is laid for the National Theatre. The Festival of Britain's only permanent landmark is the Royal Festival Hall (4).

1952 London's last trams run (5). The Golden Lane street access housing scheme is built, as is Le Corbusier's Unité d'Habitation in Marseilles. In the USA, Lever House, New York, by SOM, sets the style for future office tower blocks all over the world. IHVE turnover tops £10 000 for the first time and membership reaches just three below 2000.

1953 Queen Elizabeth II is crowned. Everest is conquered. Hunstanton School by the Smithsons is completed. The IHVE moves to Cadogan Square and membership surges by more than 200.

1954 The IHVE hears a paper on chlorophyll as a refrigerant and Roger Bannister beats the four minute mile.

1955 Winston Churchill retires and Anthony Eden becomes Prime Minister. The first atomic submarine is launched. Corbusier's chapel at Ronchamps is completed.

1956 The *Clean Air Act* is passed. Langleybury School, Hertfordshire, by James Cubitt & Partners, is completed. The IHVE *Guide* is issued in its first bound edition, running to 600 pages rather than the planned 400. Bernard Hodges becomes IHVE secretary, membership reaches 2697.

1957 The Treaty of Rome is signed. Russia launches its first Sputnik, followed shortly after by a second carrying a dog. The Pirelli building in Milan, designed by Gio Ponti, is completed (6). *IHVE Journal* editor, Henry Swinburne, misses his train home and so avoids the Lewisham train disaster. The *Journal* is passed to an outside publisher.

1958 The EEC is set up. The first rocket reaches the moon. In New York the Seagram building by Mies van der Rohe is completed. In Munich most of the Manchester United team is killed in a plane crash. IHVE membership tops 3000.

1959 Alec Issigonis launches the Mini and the hovercraft undergoes trials. The first commercial tungsten-halogen lamp goes on sale. Death of Frank Lloyd Wright. The IHVE publishes the second bound edition of its *Guide* and membership continues to rise. Thorn House (Basil Spence and Ove Arup) is completed, the first tower block in the West End, incorporating many innovations (7).

***Research/words by Jonathan David, former editor,* Electrical Design.**

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1952

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1957

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1959

1960 Energy debate

1960 The first degree course for the IHVE is launched in Liverpool, and the first overseas IHVE summer meeting is held in Amsterdam. The Electrical Contractors' Association suggests that all domestic wiring should be to IEE regulatyions, with three-pin shuttered outlets, no outlets in bathrooms and garden tools taken from an lv transformer. A Channel Tunnel is proposed.

1961 New York's Chase Manhattan Bank controls the largest ever ac system of 9100 ton-capacity with a revolutionary central console 'only' 17 ft long. Russian cosmonaut Yuri Gagarin orbits the earth. The Berlin Wall is constructed.

1962 The industrialised housing boom starts as a 'final solution' to slum clearance. The UK is refused entry to the EEC. Coventry Cathedral is consecrated (1).

1963 Following an IHVE initiative, the first REHVA meeting is held. A ten-year, £800 million hospital building programme is launched. Fires are caused by connecting electric power to frozen pipes to thaw them during a very severe winter. John F Kennedy is assassinated in Dallas. Nuclear test ban treaty, the 'Great Train Robbery', Beeching axes rail network.

1964 The CEGB says that nuclear power will be cheaper and that new types of reactor (gas-cooled) will take us beyond the Magnox era. UK and France agree to build a Channel Tunnel. End of capital punishment.

1965 Death of Winston Churchill. The Council of Engineering Institutions is formed, with IHVE support, to provide one voice for all the engineering professions. ACE accepts IHVE corporate members. National *Building Regulations* come into force.

1966 The IHVE *Wilson Report* states that corporate membership should be degree-based. The h&v industry's annual turnover reaches £300 million. A report on cooling tower collapses at Ferrybridge highlights the power of wind around high structures. The Severn Bridge is opened, while England win the football World Cup.

1967 Devaluation threatens to put the price of a house up by £250. Mortgages are already at record levels of 7-12%. Torrey Canyon oil tanker disaster occurs, the QE2 is launched and breathalysers are introduced.

1968 The merger of the IHVE with the IMechE is called off, partly because the IHVE wants to widen the scope of coverage beyond the IMechE's vision. The District Heating Association is formed. Two thirds of new houses now have some form of central heating, a huge increase in just a few years. An 18th floor gas explosion at the Ronan Point block of flats in east London triggers a house of cards collapse and the revolt against high-rise homes. The Queen Elizabeth Hall opens its doors on London's South Bank (2). The Commercial Union building in the City adopts a high-rise curtain wall cladding system.

1969 Stringent asbestos regulations come into force. The *Skeffington Report* calls for more public participation in planning. Concorde flies, oil is found in the North Sea and man walks on the moon.

1970 A milestone for the IHVE as the *Guide* changes to environmental temperature for heat loss calculations and is published in SI units as well as

1 — 1962

2 — 1968

3 — 1975

4 — 1975

fuels change 1979

in three parts. The government announces that the building industry is to become completely metric within three years. The master plan for Milton Keynes projects a 250 000 population by the early 1990s. Winscale (Sellafield) nuclear reactors suffer a serious radiation leak. The first Jumbo jet lands at Heathrow.

1971 The IHVE tries to find favour for a coding system for hotels based on environmental comfort. Currency is decimalised.

1972 The IHVE is now firmly committed to the wider concept of building services. A request to the DTI for a change of name to the Institute of Building Services Engineers is refused, effectively removing the IHVE's right to qualify engineers to the Engineers' Registration Board. The Institute suspects skulduggery by rival institutions.

1973 The IHVE publicly accuses three major engineering institutions of purposely frustrating its ambitions. The National Association of Plumbing, Heating & Mechanical Contractors is formed. First oil embargo on the West. Britain finally joins the EEC.

1974 The IHVE reports on domestic services, suggesting a revolutionary 0·6 $W/m^2/°C$ for any external wall surface. The oil rig construction bonanza starts. Meanwhile, there is the three-day week and the Building Cost Information Service reports 13% inflation in just one month. The Fairfield old peoples' home burns too fast for residents to escape, leading to the introduction of cavity barrier rules.

1975 The Heating and Ventilating Research Association becomes the Building Services Research and Information Association. The UK construction industry begins to tap into the newly rich Middle East, though UK salaries (3) remain modest. The Channel Tunnel is abandoned (4).

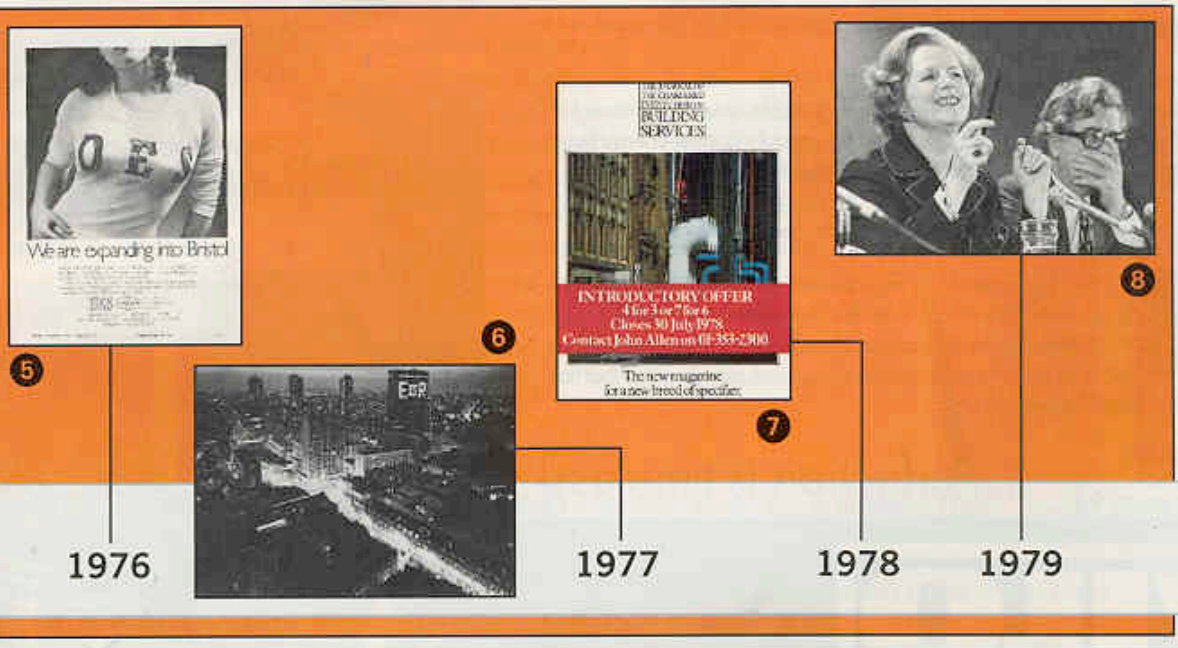
1976 The IHVE merges with the Institution of Lighting Engineers and bows out as the Privy Council grants a Royal Charter to the Chartered Institution of Building Services. It remains a man's world (5) in building services. The Greater London Council faces up to a £30 million bill for leaky roofs and windows on its 1960s buildings. The National Exhibition Centre and the National Theatre open.

1977 The *DW/141* specification for ductwork is published by the Heating and Ventilating Contractors' Association. The Department of Energy's chief scientist says the UK is suffering from a glut of energy. BP's Brittanic House celebrates the Silver Jubilee with modern lighting technology from Delmatic (6). The HVCA and the HEVAC declare peace and a will to solve industry problems.

1978 *Building Services: The CIBS Journal* is launched by the CIBS and current publishers the Builder Group (7). The CIBS launches its *Energy Code* and a *Code of Practice* is launched for the domestic solar panel market. *Investors Chronicle* reports that air conditioning can add 40% to rents for City offices.

1979 An energy crisis leads to the first serious challenge to air conditioning. The government's homes insulation grant has a disappointing start with a take-up of only 20 000. The Conservatives win power under Margaret Thatcher (8).

***Research and words by Steven Ashley, founder editor,* Building Services Journal.**



1980 The era of boom

1980 Building services engineers can earn up to £8446 pa, (1) a typical example. CIBS holds its first joint conference with ASHRAE. Rising report of Legionnaires' disease. CIBS forms Electrical Services Group.

1981 Former Hollywood actor Ronald Reagan is elected US president, shortly followed by an unsuccessful assassination attempt. Egyptian president Anwar Sadat is less fortunate. London Energy Group chairman Bill Bordass calls for an agreed procedure to measure the energy performance of buildings.

1982 Argentina invades Falklands Islands, British Forces recapture them. Israel invades Lebanon. Ted Happold signs off as Sideliner in *Building Services Journal*. The Engineering Council is formed. Fluorescent lighting is linked to skin cancer in *The Lancet*.

1983 Four CIBSE past-presidents die within a few months of each other: J R Kell, J W L Beavan, W Harding and F M H Taylor. A *BSJ* editorial highlights the problem of leaky buildings. The HVCA introduces free insurance against legal costs for its members. Ernest Magog becomes director of the Lighting Industry Federation.

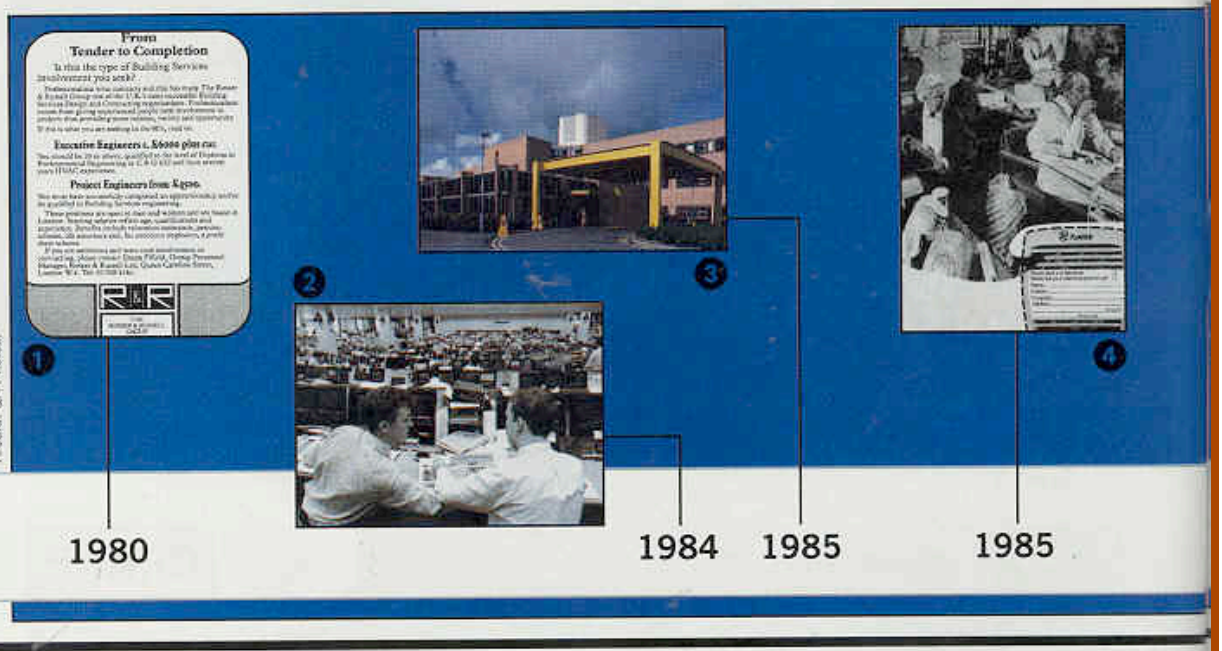
1984 Prime minister of India Indira Gandhi is assassinated. IHVE and CIBS secretary Bernard Hodges retires, Andrew Ramsay takes over. UK economy hits boom time. Efforts to produce a "Common Arrangement" for building specifications reaches draft form. Sick building syndrome of growing concern. The Association of Consulting Engineers permits fee competition - so long as it "does not fall into disrepute". Dealing rooms become big business for the construction industry (2), a boom waiting to bust.

1985 Mikail Gorbachev becomes Soviet premier. CIBS wins chartered engineering status to become the CIBSE. New *Building Regulations* published. First CIBSE/HVCA joint conference. Outbreak of Legionnaires' disease at Stafford District General Hospital (3) kills 37. Poorly maintained cooling towers are blamed. First Futures conference issues a Quality Assurance Declaration for the building services industry by 1990. Smoking in the office is still endured (4), if not always appreciated, in the mid-1980s.

1986 Space shuttle Challenger explodes 73 seconds after takeoff. Nuclear accident at Chernobyl. PSA architect Gordon Wilson designs the Princess of Wales conservatory at Kew Gardens for £4 million (5), Lloyds of London forks out £165 million for a headquarters building (6) by Richard Rogers. Hong Kong & Shanghai Bank is also completed for around £500 million. BT is privatised. Energy World at Milton Keynes demonstrates low energy domestic housing.

1987 WHO estimates that two million Africans suffer from AIDs. Canary Wharf project starts on site (7). CIBSE proposes a divisional structure. A report by Building Use Studies implicates air conditioning in sick building syndrome. Sizewell B gets the go-ahead. *Montreal Protocol* agreement signed on reducing emissions of cfcs.

1988 Founder editor Stephen Ashley leaves *Building Services Journal* after ten years. George Bush becomes US president. Broadgate development completed. Britain's worsening balance of payments heralds forthcoming recession. Building Industry Council formed, chaired by Ted Happold. Electricity industry privatised.



Arcaid. GA Photos.

and bust 1997

1989 Communist rule collapses in eastern Europe, culminating in fall of Berlin Wall. Tiananmen Square massacre in Beijing. Updated *Building Regulations* and *COSHH Regulations* introduced. ACE allows consultants to advertise.

1990 East and West Germany reunited. Margaret Thatcher forced out as Tory leader, John Major succeeds her. Iraq invades Kuwait. UK economy free-falls into recession. French and British tunnellers meet up under the English Channel. $2.5 million Hubble space telescope deployed. IEE and IMechE consider merger, but decide against. The BRE launches first environmental assessment scheme: BREEAM. Ban on cfcs extended. York launches chillers using R123.

1991 Boris Yeltsin becomes first elected president of the Russian Republic. Civil war breaks out in Yugoslavia. UN defeats Iraq in Desert Storm. Apartheid ends in South Africa. Second Futures conference calls for standard tender documentation.

1992 Bill Clinton becomes US president. Prince Charles and Diana separate. Property Services Agency privatised. Manufacturers fight government proposals to limit use of air conditioning. The CIBSE creates a Natural Ventilation Group. Nigel Mansell wins Formula One title - finally.

1993 World Trade Centre bombed, injuring 1000. A Branch Davidian cult siege in Texas ends with 86 dead. European Community tightens up phaseout for hcfcs to 2014. Domestic fan manufacturers fight provision for passive stack ventilation in the *Building Regulations*, while air conditioning limits in *Part L* are criticised for being unworkable. Coal industry collapses.

1994 Nelson Mandela becomes first black president of South Africa. Richard Nixon dies. The *Latham Report* sets out rules for reforming the construction industry. Chilled ceilings and displacement ventilation become overnight success. *Part L* proposals ditched. Channel Tunnel opens (8).

1995 Yitzhak Rabin killed by Israeli extremist. Kobe earthquake kills 5100. UK building services costs criticised for being 50% higher than other European countries. *CDM Regulations* come into effect, as does the delayed and much subdued update of the *Building Regulations*. Lloyds of London starts legal proceedings over corrosion on its £165 million building.

1996 Hutu-Tutsi conflict flares in central Africa. IRA ceasefire ends when a bomb explodes in London's Docklands, destroying the offices of *Building Services Journal*. Former French President Francois Mitterand dies, as does former Labour PM Lord Wilson and engineering guru, polymath and writer Sir Ted Happold (9). In Scotland 16 children are killed in the Dunblane massacre.

1997 Labour wins General Election with massive majority. Hong Kong returns to Chinese rule. 71 hostages rescued are in Peruvian embassy siege. Diana, Princess of Wales, and Dodi Fayed are killed in a car crash in Paris, just days later Mother Theresa dies. CIBSE secretary Andrew Ramsay leaves for the Engineering Council. The BRE is privatised.

2000 The Millennium Dome is completed. Possibly.

***Research/words by Roderic Bunn, Editor,* Building Services Journal.**