WILSON WEATHERLEY PHIPSON
1838-1891

No portrait has so far been discovered

[203] Wilson Weatherley PHIPSON 1838-1891

English civil engineer, specialized in heating and ventilation. Worked as a consultant and sometimes in a contracting capacity. Educated in Brussels and Paris. Later, a pupil of Dr. Van Hecke of Brussels “who discovered a new method of heating and ventilating which had already given some very satisfactory results.” Assisted Van Hecke to warm and ventilate the hospitals Necker and Beaufin in Holland. Came to London (1859) “with the object of introducing a new system of heating and ventilation devised by his old master Van Hecke.” Phipson employed mechanical and natural ventilation systems, often together, with varying degrees of success. He was both a pioneer and an innovator. He carried out a number of important projects including Baron Rothschild’s residence and bank, the Strand Music Hall (1864), Glasgow University (from 1864), Royal Holloway College, Egham (1882); and in London: the Natural History Museum (1873, and where he beat the firm of Haden in competitive tender), Royal Albert Hall (1871), Alexandra Palace (1874), and the Empire Theatre in Leicester Square (1890). Was also involved (1886) in the early development of the Prudential Assurance building in High Holborn, where he specified steam-driven dynamos with the exhaust steam used for space heating—an early example of combined heat and power. His scheme for the warming and ventilation of St. Thomas’s Hospital (1865) was not successful. Was an advocate (c. 1888) of the American developments in steam district heating and of the Boston Prall high-temperature hot water heating system. He killed himself through overworking and excessive travelling (over 3000 miles in a fortnight). His practice was taken over by Ashwell and Nesbit [232 and 268].

(Mini-biography from “The Comfort Makers,” Brian Roberts, ASHRAE, 2000)
WILSON WEATHERLEY PHIPSON
Victorian Engineer Extraordinary
1838-91

Brian Roberts

Wilson Weatherley Phipson, Brian Roberts, CIBSE Heritage Group, 2006
(CIBSE Heritage Group Collection)
The complete book is available under Electronic Books on this web site
See also under Victorian Heating Engineers
PART-I PHIPSON THE MAN

Wilson Weatherly Phipson was the third son of Samuel Ryland Phipson of Ladywood, near Birmingham, where he was born on 31st August 1838. From the Family Tree, Samuel was born 20th June 1803 and married Ellen Emma Elizabeth Lamb, born 1813, on 22nd December 1831. Wilson had two older brothers, Thomas Lambe Phipson, born on 5th May 1833 who went on to become a Doctor of Analytical Chemistry and an Author of 25 books. His other brother William Barroll Phipson is somewhat of a mystery. The only record of him is to be found in the 1861 census which gives his occupation as Artist and his birth around 1835. No record has been traced of his birth or death. He is mentioned in the Wills of his mother and sister Florence. From the wording of their Wills it could be surmised that he suffered from an illness or disability and therefore may have institutionalized or lived abroad. There were three daughters: Emma Julia Phipson born 1840, who died as an infant, Emmeline Claridge Phipson born 1842, who married Henry Rutter in Pimley on 30th October 1865. The youngest daughter Florence Greville Phipson born 1852, never married and in her will left her Estate to her Solicitor.

There is a record of the christening of Wilson Phipson on 11th October 1838 at Old Meeting House, Birmingham. His birth is not registered at the General Register Office, which only started in 1837, and in the early years not all births were registered. A Meeting House often is an indication of Protestant Non-conformists.

It was said that both his father and his mother devoted themselves most strenuously to the welfare of their children, and that it was, throughout their lives, an uninterrupted labour of love, which resulted in making all the members of their family extremely united and affectionate.

Samuel Phipson, one of the most amiable and enlightened men of his time, occupied a prominent position in society; even in his early youth, soon after he had returned from the German University of Jena, where he was educated, his superiority was already recognised by his intimate friends who were struck by his truly princely manner and great generosity. He kept open house at Ladywood where, as long as they liked to stay, there were always bed and board for his guests, and a place in the stables for their horses. He was universally esteemed and was in many ways a benefactor to his country.

Among his visitors at the time his son Wilson was a child, were Sir Henry Bulwer, Thomas Carlyle (the historian and essayist), William Charles Macready (a leading actor and producer, who managed both Covent Garden & Drury Lane), Dr. Kennedy (of Cambridge University), Philip Henry Muntau, Attwood, Tesseren de Bert (French Minister of Agriculture), Scholfield (Member of Parliament for Birmingham), Charles Henfrey, and many other distinguished men.

Nevertheless, Samuel was soon obliged to give up this enviable position and to leave his native country for the second time. At the recommendation of some of his relatives he had placed large sums of money in the celebrated North of England Joint Stock Bank, both as a depositor and a shareholder. And when about 1847 that bank failed, and ruined a great number of people, it threatened to ruin him also, for those were the days of unlimited liability. But to make matters still worse, a United States Bank, in which, at the pressing of his friends, he had become largely interested, also failed about the same time, so that his ample fortune was thus, by no fault of his, reduced to a very moderate income. Moreover, a few years earlier in 1843, his mother, who had a beautiful residence on the river Wye, was seized with illness on her way from Hereford to Ladywood, where she was coming on a visit. She died in his house.
The fortitude and philosophy with which Samuel Phipson bore these dreadful losses, and the energy he displayed throughout his long life, to maintain his high social position, form one of the grandest examples of self-denial, perseverance and tact, that could possibly be placed on record. He decided to leave England for some continental city where living was cheaper and where education was not only cheaper, but also better. Brussels was fixed upon, and he resided there for many years.

Wilson Phipson was between ten and eleven years of age when his father took up his abode in the charming capital of Belgium, at that time a very delightful residence, and within easy reach of Ostend, a rising seaside resort. He was educated at Brussels, and also at Paris, where his family resided for a few years before they came to England, and where, through the instrumentality of Earl Cowley, his father was enabled to enter his as a student at the Ecole Impériale des Ponts et Chaussées. (Phipson’s Application for Member of the ICE [PC/2] records he was an external pupil of the Ecole for 3 years, 1854-5-6)

Whilst in Brussels, Wilson Phipson was for a short time (2 years, 1857-8 [PC/2]) the friend and pupil of Dr Van Hecke, a gentleman who had discovered a new method for the heating and ventilating of hospitals (listed on page 21), which had already given some very satisfactory results on the ground of economy as well as efficiency. When his studies at the French School of Engineering were completed he assisted Van Hecke in Paris where he warmed and ventilated the hospitals Necker and Beaujon, and accompanied him to Bordeaux and to Holland, where similar work was done on some Government buildings.

At this time Wilson Phipson lived with his parents, and enjoyed during his many years residence in Brussels, and his visits to Ostend, the advantages of the best society. His musical talent as a pianist and his splendid voice, no less than his handsome presence and genial gentlemanly qualities, caused his to be a great favourite. Whilst still a student-engineer he was, for some time, quite a leader of the fashionable youth of both these places.

It was then he made the acquaintance of Prince George of Prussia, who was very fond of him, and endeavoured to induce him to become his secretary and travelling companion. Phipson had, however, too many ties in Belgium; and he did not speak German as his father did. He took great interest in the new ventilation scheme of Van Hecke—a real enthusiast who exerted considerable influence. In those early days, on the young engineer’s future career, and taught him the first elements of that art which he was destined, in after years, to bring to so high a degree of perfection. Moreover, Wilson Phipson was at that time, paying his addresses to a noted young beauty, an English lady of good family.

Though barely eighteen years of age, he had many excellent friends at this period, some considerably older than himself. Among them were Baron von Rosenberg of Dresden; Leloup, Engineer in Chief of the Northern Railway of Belgium; the Nagelmackers of Liège, a wealthy and influential family who treated him as one of themselves (believed to be the Nagelmakers whose son Georges later created the Wagon-Lit, based on the American Pullman coach); Victor Eekhout, the well-known Belgian painter; and numerous others....

About 1859 or 1860, his family came to London and he accompanied them with the object of introducing here the new system of heating and ventilation. The amount of prejudice and ignorance he had to overcome, both in the medical world, and among the architects, was quite astonishing. The art of ventilation was entirely in its infancy, and complaints about the impure atmospheres of our law courts, theatres, hospitals and other public places were of daily occurrence. Yet he could not get the offer of any building!

Besides his little work showing the great benefits of the new system, he published an important paper, which he had read and discussed before the Medical Officers of Health who met at the Marylebone Court House (a copy of this paper has recently been found). Dr Dundas Thomson, the eminent chemist, Dr Bourdon Sanderson and several other physicians of note who attended the meeting, were much in favour of his scheme, and all were surprised at the economy and efficiency of the applications. The Lords of the Admiralty gave him permission to ventilate a ship at his own expense; it cost him £60, but it only opened his eyes to the tricks of the subordinates in the Government Dock Yards. (other ventilation engineers had similar difficulties with Admiralty trickery [BSE, 214-6] who resisted change or outside influences of any sort).
At last through the influence of his father, he obtained the contract to warm and ventilate the bank of Baron Rothschild in St Swithin's Lane, and also the Baron's private residence in Piccadilly, designed by the architect T Marsh Nelson. It was said that the success of these applications attracted the attention of some of the leading architects of the day. As a result, a number of other important buildings were placed in his hands, the first of which appears to have been The Strand Music Hall. No doubt, Phipson's lobbying of potential clients and his father's influential circle of friends played their part. Other works followed: the Royal Albert Hall, the Natural History Museum at Kensington, the Alexandra Palace, when rebuilt after a fire. The National Provincial Bank of England in Bishopsgate, the Institution of Civil Engineers, the new University buildings at Glasgow, the University Medical Schools at Edinburgh, the Royal Exchange in Birmingham, the Law Courts and Town Hall in Birmingham, the Guildhall in Gloucester; Holloway College and Holloway Sanatorium in Surrey, the Royal Infirmary in Liverpool, Exeter Asylum, Cardiff Castle, the Criterion Theatre, the National Liberal Club, the Empire Theatre, Exeter Hall, the Royal Aquarium, etc. [*Case studies in Part-3.]*

For the heating and ventilation of the Glasgow University, Wilson Phipson was chosen unanimously by a committee of the Professors, and that was considered, perhaps, the greatest honour which could possibly have befallen him. On this occasion, it is said, he made the personal acquaintance of the celebrated Professor Rankine, Sir William Thomson (Lord Kelvin), Dr. Thomas Anderson, Dr. Allen Thomson, and several other distinguished men, which it was said soon ripened into a life-long friendship. This may be an exaggeration if one reads the ICE discussion after Phipson delivered his paper on Glasgow University, for he received considerable criticism. [Sect. 3.2.]

Wilson Phipson was said to have worked in conjunction with many well-known architects of the Victorian era, including Wyatt, Sir George Gilbert Scott, George Edmund Street, Thomas Verity, Alfred Waterhouse, Marsh Nelson, Pugin, William Burges, etc, most of whom were his intimate friends. To these can he added a working relationship with John Belcher, William Crossland, John Gibson, Lt-Col H Y D Scott, and Aston Webb. However, to date, no direct working link has been found to either of the Wyatts (Sir Matthew Digby or his brother, Thomas Henry) or to either the elder Pugin (Augustus Welby Northmore) or his son (Edward Welby) [more detailed information on architectural links is given in Appendix-F].

Wilson Phipson married Elizabeth Humberstone Newcombe on the 28 May 1867 at the Parish Church in the Parish of St George, Stamford in the County of Lincoln. She was the daughter of a solicitor, Frederick Newcombe, and niece of the mayor of Stamford. Both fathers were described as Gentlemen on the Marriage Certificate. Phipson listed his Profession as Civil Engineer, his address as Putney, Surrey. Elizabeth's address was listed as St George, Stamford. The marriage was by licence and not banns. This may be a Victorian status symbol, or because people were not resident, or because of a religious difference. The witnesses were F P Newcombe, Matt Wyatt [Matthew Digby Wyatt the architect], Florence Grevelle Phipson and O N Simpson. [Matt Wyatt is also shown as a witness on the Marriage Certificate of Wilson's elder brother, Thomas Lembe, who married Catherine Julia Taylor at Putney Church on 30 September 1865, when Thomas listed his Profession as Analytical Chemist. Matthew Wyatt (later Sir) was clearly a close friend of the family.]

Having no family, Wilson adopted and educated one of Elizabeth's nieces. On the death of his wife's father he was left trustee to the Newcome estate at Long Clawson, in Leicestershire, where being an accomplished sportsman, he often passed his holidays during the shooting season (on his death it was said he was sadly missed by the poorer classes of the community).

The two Phipson brothers were always the staunchest friends, and for twenty years—from 1867 to 1887 when their father died—they used to meet frequently at The Cedars, Putney, the residence of the latter, where the three might often be seen spending the evening together, smoking on the balcony overlooking the river, and chatting about the events of the day, whilst the barges and boats glided tranquilly past on the ebbing tide, and the midsummer twilight merged visibly into that of dawn. [The Cedars, built in 1853 and demolished c.1890, was a terraced 5-storey, 7 bedroom residence, with 2-drawing rooms and a conservatory on the first floor, PRP. 60.] The addresses for the brothers have not been found in the 1871 Census Records, but the Records for 1881 and 1891 show that Wilson was living at 40 Charlwood Road, Putney and Thomas at 8 Hotham Villas, also in Putney: these roads still exist.]
The 1881 Census Records reveal that living with Phipson and his wife, were the nieces Elizabeth E Newcome, age 9, and Florence, age 4. Living with Thomas, now described as Doctor of Science, were his wife and Mary Taylor, spinster, age 44, sister-in-law. The 1891 Census records Elizabeth Newcome plus one servant at Wilson’s home; presumably he and his wife were away. At the house of Thomas, now listed as Doctor of Science, author and journalist, were his wife, Mary Taylor, plus two servants. [The records show some age discrepancies]

His father’s death, in 1887, was a great blow to Wilson Phipson, from which he never entirely recovered. Long before this sad event occurred, however, he had risen high in his profession; the income derived from his engineering labours amounted to a very considerable figure; and he was consulted on many subjects besides those connected with heating and ventilation. In spite of his increasing professional work, he was for several years an active member of the Surrey Rifle Volunteers, and this is a curious circumstance when taken in conjunction with the fact, many years previously, his own father was the first to suggest, in a letter to The Times newspaper, written from Brussels (Jan 1852), the advisability of organising, in England, corps of Rifle Volunteers.

After being elected an Associate of the Institution of Civil Engineers on 12 January 1869 [PC/1], Phipson was elected Member on 26 February 1878 [PC/2]. His Application for Associate was supported by Joseph W Bazalgette (the engineer responsible for London’s interceptor sewer system) and among others, by the architects Thomas Henry Wyatt and Matthew Digby Wyatt. When he applied to be a full Member, his supporters included William Thomson (Lord Kelvin). At an ICE meeting in 1878 he read an important paper describing his work at the Glasgow University. This was published, with drawings, in the Proceedings of the Institution. He also published several notes and papers in this and other journals; but his active, outdoor life allowed him little time for literary occupations, though he was constantly being solicited by the editors to write for them.

About the year 1879, or 1880, he went once more to Paris, to ascertain whether any improvements had been made in the heating and ventilating of public buildings since his time. On this occasion he received the greatest attention and politeness from Tessereu de Bort, Minister of Agriculture, an old friend of his family, and from the Minister of Public Works.

In London his sound judgment and upright character were taken advantage of, on more than one occasion, when he was appointed arbitrator in complicated business disputes of his own profession. He was much sought after in society and his singing was greatly admired. For nature had gifted him with a magnificent tenor voice; he was also a good pianist, and his love for dancing was, probably, never surpassed. He was, himself, an excellent dancer. Before he left Brussels he had published several pieces of music, and at the time of the marriage of the Princess Charlotte of Belgium with the unfortunate Emperor Maximilian, he composed and dedicated to her, his “Carillon des Noces” for piano solo. The young princess was so pleased at this that she insisted on keeping the MS, and Phipson had to make another copy for his publishers.

But this gaiety, for which he was so well organized, diminished considerably of late years, partly on account of the frequent indisposition of his wife, and partly from increasing professional engagements. Doubtless his natural tastes and accomplishments tended rather to make him a leading member of fashionable society, but his destiny ruled that he was to pursue a far more practical and useful career (the author has removed the word gay as coupled with fashionable society in the original text!).

As the extent and importance of his works increased this career became one of great anxiety and constant toil. He had been heard to say that professional competition in the present day (1880s) had gone beyond its legitimate bounds (there are those who would say that some one hundred ad twenty years later, nothing has changed). It was remarked that in order to secure large contracts, materials were often promised which were not supplied of the quality indicated. It was said that liberality (a conspicuous trait in Phipson’s character) was more or less extinct; confidence was shaken, if not entirely gone, and a man of honour and integrity could scarcely work with a fair chance on ensuring even a moderate profit for his labours. Phipson lost about £1000 by his work at the Royal Infirmary at Liverpool for reasons that are not clear. He is also said to have made minor losses in Exeter (the Asylum?) and London due to failure of builders and disputes between architects and local boards.
A review of his expertise stated,

To give some idea of the perfection to which the heating and ventilation of large buildings was brought under his hand (for he had long ago improved on the old system and latterly worked by low pressure steam on the gravity, or open circulation system), it may be stated that not only was the exact temperature required, kept up, summer and winter alike, in any given section of the building, but if by accident the thermometer in any particular room showed an abnormal degree, it was at once indicated by an electric current, which affected the dial fixed in the engine room, where the man in charge could see at a glance what had happened, and could rectify it without delay. Near the boilers were a series of these dials, corresponding to the different sections of the building.

Around 1867, Phipson had suggested a remedy to the bad ventilation at Birmingham Town Hall, but was largely ignored. In 1891, he was engaged to undertake the improvements and it was his last work [see Sect.2.6].

It was said that the last twenty years of his life were of incessant activity. According to his brother, Dr Phipson,

His impetuous career, and its sudden, tragic end, appears to me like the passage of a brilliant meteor, terminating in an explosion. In the course of a quarter of a century that I have known him most intimately, I have never found him asleep but once - it was on the 21st October, 1891, at 8 o'clock in the morning. . . . . . he was dead! He fell, as a gallant soldier falls in the field of battle, full of life and activity, and in the midst of duty."

In a summing up of his career [WWP, 15-18] it was written that it was by hard work and persevering study that Wilson Phipson attained the high position he held among his colleagues. This eulogy reveals something of his method of working, for he appears to have been designer, supervising contractor and entrepreneur. It tells us that he worked with the sole aid of his clever draughtsmen, William Pelly and Edward Temple, and his chief fitter, a Mr Harper, which enabled him to grapple successfully with the multitudinous exigencies of his profession. He worked long hours. He used to leave his house in Putney by eight in the morning and would be at his office at 14 John Street, Adelphi (off the Strand) by nine. [Correspondence shows that his office up to at least 1882 was at 1 Salisbury Street, just around the corner from Adelphi.] Phipson made long and frequent railways journeys to his many projects dotted around the country. It is known that for weeks together he slept in a Pullman car. During the month of October in which he died, he travelled over three thousand miles in little more than a fortnight, to superintend works recently completed and to attend consultations. That averages around 200 miles of travelling each day, a remarkable figure for the times.


Added to the strain of work, it is believed that problems in his private life, described as domestic afflications and troubles, also told upon his usually robust health. It was said that he kept up his courage to the very last, helping those who needed his assistance and giving to the poor far more than he could afford.

But it was more than even his strong constitution could support, and he died very suddenly from the rupture of a blood vessel, just after taking his cold bath, on the morning of the 21st of October, at the age of fifty-three. Many of his friends thought him at least ten years younger. [His Death Certificate, registered in Wandsworth and dated 23 October 1891 records his age as 52].

Phipson was described as a worthy man, of admirable character, and how one knowing him was struck by his determination, his strict honesty and his liberality (generosity). A relative wrote of him:

He inherited the indulgent kindness which was so characteristic of his father; he could not see a case of suffering without making an attempt to relieve it. In the country he kept open house, and in town his office was frequently visited by poor inventors who rarely went away empty-handed. His liberality was taken advantage of by those of his own profession who desired to be enlightened, until they actually became formidable rivals and keen competitors. He supported several old people in town and in the country. He lavished his affections upon his wife and niece, whose every whim he satisfied with a degree of good nature that amounted nearly to weakness; and so he acted towards every member of his family, by all of whom, even to his second cousins, he was most highly esteemed and beloved.
Phipson, it was said, was a great favourite with the ladies, in spite of a somewhat abrupt, boisterous manner, acquired by daily contact with rough artisans. But we know he moved in refined society and certainly, in his youth, had a talent for playing the piano, for singing, and for dancing. It was noted that many of these ladies

it is no marvel—from his very birth
His soul was full of love—which did pervade
And mingle with what’er he saw on earth

Farewell then, noble cousin! We will meet
In freedom and true Sovereignty.
[Marino Faliero]

Phipson’s Will is reproduced in Appendix-E. It appears he hoped his practice would continue. However, Frank Ashwell of the Leicester firm of heating contractors, Ashwell & Nesbit, took over his business in the early part of 1892 and continued to use his address until 1895 when they moved to larger premises [AN, 15 & 18]. Ashwell’s partner, David Mein Nesbit had a distinguished career in heating and ventilating. He was partly instrumental in the founding of the American Society of Heating & Ventilating Engineers (1894); he was the 3rd President of the Institution of Heating & Ventilating Engineers (1900) and the 1st President of the Heating & Ventilating Contractor’s Association (1904-9). Phipson’s business continued in good hands.

(Text extract from “Wilson Weatherly Phipson,” Brian Roberts, CIBSE Heritage Group, 2000)
Handwritten proposal by Phipson’s clerk, 1865
(One of many papers in the Phipson Archive, CIBSE Heritage Group Collection)
Hand-written enquiry by Phipson for cylinder, Royal Holloway College, 1882
(One of many papers in the Phipson Archive, CIBSE Heritage Group Collection)
11. If the weather is very cold, the gas should be freely used for lighting the theatre for the first hour or so, after which turn on the electric lighting, should be in good working order and the gas lights put out.

12. The burners in the foyer must be kept slightly on at all times for carrying away the smoke. The side windows should also be kept at all times partially opened, and when free possibility be opened to their full extent.

13. The smoke openings in must be trimmed regularly, and seen that they are properly opened.

Last page of Phipson’s hand-written Operating & Maintenance Instructions, The Empire Theatre, Leicester Square, 1890: The year before his death (One of many papers in the Phipson Archive, CIBSE Heritage Group Collection)
Strand Music Hall, London, 1864
Birmingham Council House, Museum & Art Gallery, 1875

Victoria Law Courts, Birmingham, 1886
Glasgow University, 1870

The Royal Albert Hall, London, 1871
Criterion Restaurant & Theatre, London, 1874

Natural History Museum, London, 1880
Birmingham Town Hall (built 1835, Phipson’s ventilation improvements 1890)

Prudential Assurance, High Holborn, London, 1886
A further extension of activities took place in the early part of 1892 when Frank Ashwell bought the goodwill of a well-known London consulting engineer, W. W. Phipson, and took over his office at 14 John Street, Adelphi. Mr. Phipson, who had made a special profession of heating and ventilating, had worked for many of the leading architects in London and the Provinces and was responsible for some of the most massive installations ever carried out in this country. Those of his drawings which have survived show that the amount of space taken up by the ducts and other apparatus would not suit the ideas of a modern architect, and there was, of course, a complete lack of any sort of automatic control. However, Phipson was an acknowledged leader in his field and designed systems for many notable buildings including the Royal Albert Hall and an enormous mansion for the Marquess of Bute at Rothesay, for which the plans have survived.

(Extract from “Ashwell & Nesbit Ltd, 1879-1969”)

---

**A Memoir, 1892**

*O, learn to read what silent love hath writ*

* * * * *

*And thou in this shalt find his monument,*

*When tyrant's crests and tombs of brass are spent*

---

The life of an honest and accomplished man who has risen to the highest rank in those branches of his profession which he had adopted, is always interesting and instructive. But it becomes still more attractive when it is found to be an active, adventurous life, and one that has left good works, and good examples, by which it will be long remembered.

Such a life is that of WILSON WEATHERLEY PHIPSON, who has been snatched suddenly away from us whilst in the full enjoyment of robust health - a man (to quote the words of a contemporary) of great talent, power, and industry, whose loss will be felt far and wide in Great Britain.
Putney Grave of Wilson Weatherly Phipson and his Father (Samuel Ryland Phipson)
FOOTNOTE

PHIPSON

Wilson Weatherley Phipson. # 14 John Street, Adelphi, London, WC. A Civil Engineer who specialised in heating & ventilation. Worked as a pupil of Dr Van Hecke of Brussels. From about 1862, active as a consultant and contractor, apparently functioning as both and possibly employing other individuals or firms. Is known to have been a competitor of Haden, whom he beat in the tender for the Natural History Museum in 1873 [DVH, DWI & DWIT]. Other notable projects include Rothschild’s Bank, London [TB/1862/786-7]; National Bank of England, Threadneedle St [TB,1865/909]; Birmingham & Midland Bank, New St [TB,1869/40]; Glasgow University [TB,1870,966-7], the Criterion, Piccadilly [TB,1871/526-7], Hull Dock Company Offices [TB,1872/126-7], National Provincial Banks at Newcastle-upon-Tyne [TB,1872/786] and St James’s Branch, Piccadilly [TB,1873/487], Todmorden Town Hall {tb,1873/302-3}, Royal Holloway College at Egham (1882), Royal Albert Hall [TB,1870/996 & 1046], the second Alexandra Palace [TB,1874/688-9] and The Prudential Assurance in High Holborn (from 1886) where he suggested a combined heat & power installation. When he died in 1891 his practice was taken over by Ashwell & Nesbit. [WVP, WWPB, WWPE]. {The CIBSE Heritage Group Collection holds some sixty documents relating to Phipson, many of them handwritten originals.}

(Entry from CIBSE Heritage Group Records:
Items marked TB indicate references from “The Builder,”
giving year and page numbers over the period 1843-1883)
RAOUL PIERRE PICTET
1846-1929

Pioneered $SO_2$ refrigeration
[91] Raoul Pierre PICTET 1846-1929

Swiss professor of physics. Began a study of refrigerants (1872), particularly SO₂, which had earlier been considered by A.H. Tait (USP 94,450: 1869) and possibly by Holden [89] (c. 1870). Pictet designed an SO₂ compressor (1874), which was built and worked in the following year (BP 2727: 1875). His machine was manufactured in Switzerland, and later in France, but not much used elsewhere. SO₂ was used by Audiffren [94] and later by the early U.S. domestic refrigerator industry.

(Mini-biography from “The Comfort Makers,” Brian Roberts, ASHRAE, 2000)

Figure 9-29 Raoul Pictet’s sulfur dioxide ice-making machine, 1875. A unique feature of Pictet’s compressor was the lack of oil or grease: “…a very important part is the fact that it is a lubricant. It follows that if the cylinder is water jacketed to promote slight condensation on its interior walls, no oil whatever need be fed to the piston” (W.S. Douglas, 1911, “Sulphur dioxide as refrigerating agent,” Ice and Refrigeration, vol. 41, October, p. 114) (from Les Machines à Glace by Auguste Perret, Paris, 1904, Figure 94).

(From “Heat & Cold: Mastering the Great Indoors,” Barry Donaldson & Bernard Nagengast, ASHRAE, 2000)
While Linde preferred ammonia, Pictet in 1874 went to \( \text{SO}_2 \). His commercial machines of 1878 had a horizontal double-acting compressor in a cooling jacket, and the hollow piston-rod and piston were water-cooled. Neither cylinder nor piston-rod were greased, reliance being placed for lubrication on the drops of \( \text{SO}_2 \) condensed on the cold surfaces. Both the condenser and the evaporator were of quite modern high-capacity design, forgotten for decades, and re-invented in 1920. The vertical shell-and-tube condenser was similar to that of marine steam engines. The compressed vapour entered at the top of the shell, and after liquefaction the liquid was led from the bottom to the expansion valve. Cooling water entered at the base, rose through the tubes and left via the outside annular space. The evaporator consisted of two horizontal headers connected by numerous vertical tubes; it was immersed in a brine tank provided with a circulator. The ice-cells could be placed in the brine tank (Fig. 5.8).

Fig. 5.8. Pictet's \( \text{SO}_2 \) ice-making machine (ca. 1878).

\( \text{SO}_2 \) machines were manufactured in Germany in 1885. They were well known in France and Switzerland, but were not much used elsewhere in Europe.\(^{(12)} \) \( \text{SO}_2 \) was superseded by ammonia because the latter needed smaller plant for the same duty, and by \( \text{CO}_2 \) since this was non-toxic, non-flammable and non-corrosive. The development of small machines for household use since 1920 has brought \( \text{SO}_2 \) back into favour, for in hermetic compressors, the main disadvantages (smell and toxicity) were unimportant. The prototype of a hermetic machine was designed by Abbé Audiffren in 1903,\(^{(12)} \) and built by Brown Boveri. The electric motor was not sealed in. Machines for ½ to 10 kW cooling capacity were constructed. Later, GEC and other makers enclosed the motor also — a construction first proposed by D. H. Stokes of Sydney in 1918. \( \text{SO}_2 \) was the commonest refrigerant in domestic systems built in the USA from the 1930's until the early 1950's, when its use rapidly declined.

(From “Building Services Engineering,”
Neville S Billington & Brian M Roberts, 1982)
Raoul Pictet Pavilion, Geneva Exhibition, 1896
RUDOLF PLANK
1886-1973

“The Grandfather of Modern Refrigeration in Germany”
Plank was born in Russia. In 1913, he became a Professor at the Technical University of Danzig and in 1925, a Professor for theoretical engineering at the Technical University of Karlsruhe. After World War II, he became Chancellor of the University. Throughout his professional career, Professor Plank was associated with the Deutscher Kälte-und Klimatechnischer Verein, DKV (German Society of Refrigeration and Air Conditioning). In 1948, after World War II, he refounded the DKV and served until 1966 when he became Honorary President of the Society. Professor Plank has been described as the grandfather of modern refrigeration in Germany and perhaps in all of Europe. He was the publisher of a twelve volume "Handbuch für Kältetechnik" (Handbook for Refrigeration) and authored many papers in the Handbook. He also published a well-known book on "Kalteverdichter" (Compressors in Refrigeration). Professor Plank was one of the early people to discover that the quality of frozen food was enhanced by plunging the temperature rapidly through the freezing range. He experimented with the prediction of freezing time. He was one of the giants who changed the face of the refrigeration field. Rudolf Plank was inducted into the ASHRAE Hall of Fame in 2001.

(Edit excerpt from ASHRAE “Hall of Fame” Citation)