

1955: Kresge Auditorium, Massachusetts Institute of Technology. Architect: Eero Saarinen.

HISTORICAL WORKS IN PROGRESS

**PLANNING, CONSTRUCTION
AND OPENING**

PART TWO

BRIAN ROBERTS



1930-31: The Empire State Building, New York. 1050 ft high. 85 floors. Architect: Shreve, Lamb & Harmon.

The author visited the Empire State Building in 1972.



Constructing the Museum and Sculpture Garden on the Mall 1970-74.
Architect: Skidmore, Owings and Merrill.

CONTENTS

The contemporary photographs, plans and illustrations of historical buildings in London and in the United States are arranged in two sections in the order listed below.

PALACE OF WESTMINSTER (PARLIAMENT) LONDON

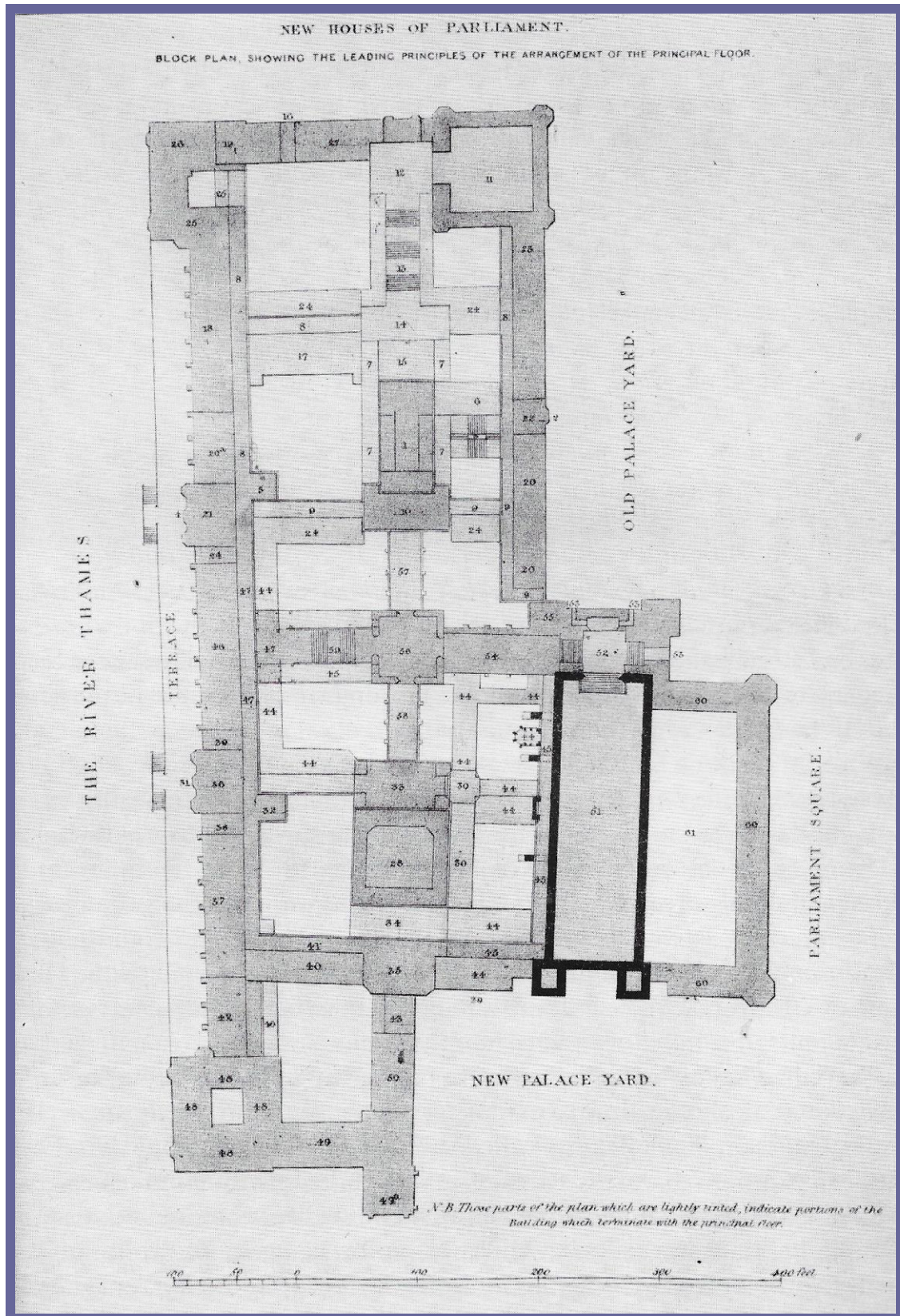
Plan of 1836, Opening Parliament, House of Lords, Under Construction,
South Wing Towers, Lords Interior, West Front.

Appendix M&E Services: Heating, Ventilation Plumbing, Lighting,
Reports of Barry, Gurney and Molesworth.

THE UNITED STATES

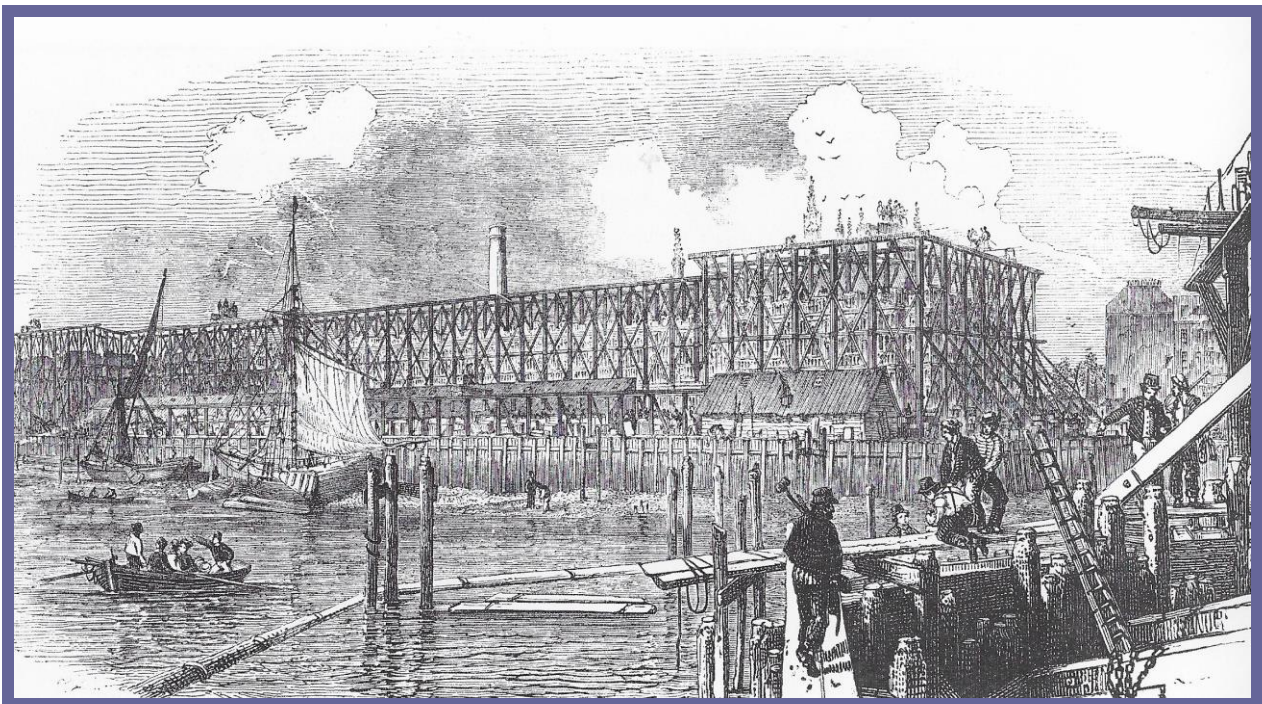
U.S. Capitol, Pension Building, Statue of Liberty, Biltmore Mansion, Flatiron Skyscraper,
Times Tower, Goodyear Airdock, Falling Water, Johnson Wax, Rockefeller Centre.
Marina City Apartments, John Hancock Skyscraper.

THE PALACE OF WESTMINSTER



Plan of the 1836 adopted design for the New Houses of Parliament.

PLANNING AND CONSTRUCTION



- (a) A water colour showing the proposed central tower of the Palace (later changed).
The painting was presented by Barry to Tsar Nicholas I.
(b) The new building under construction in June 1842.

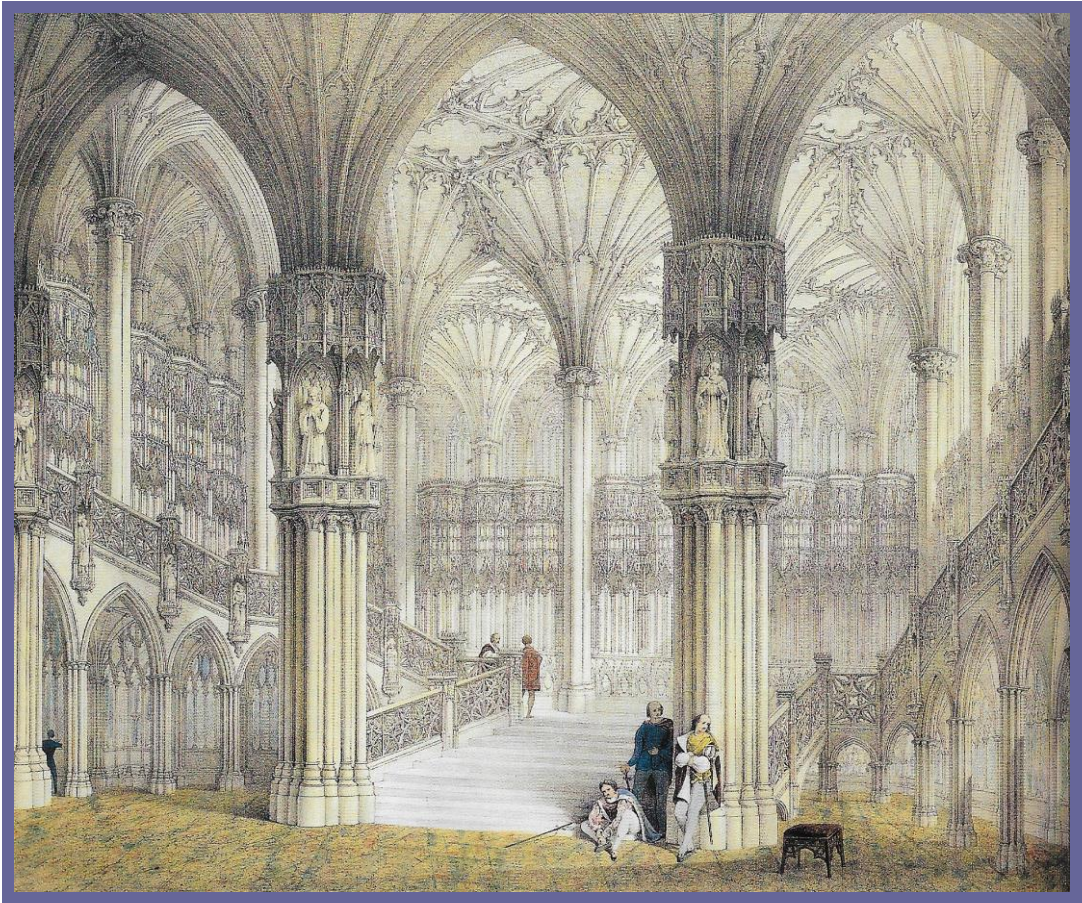
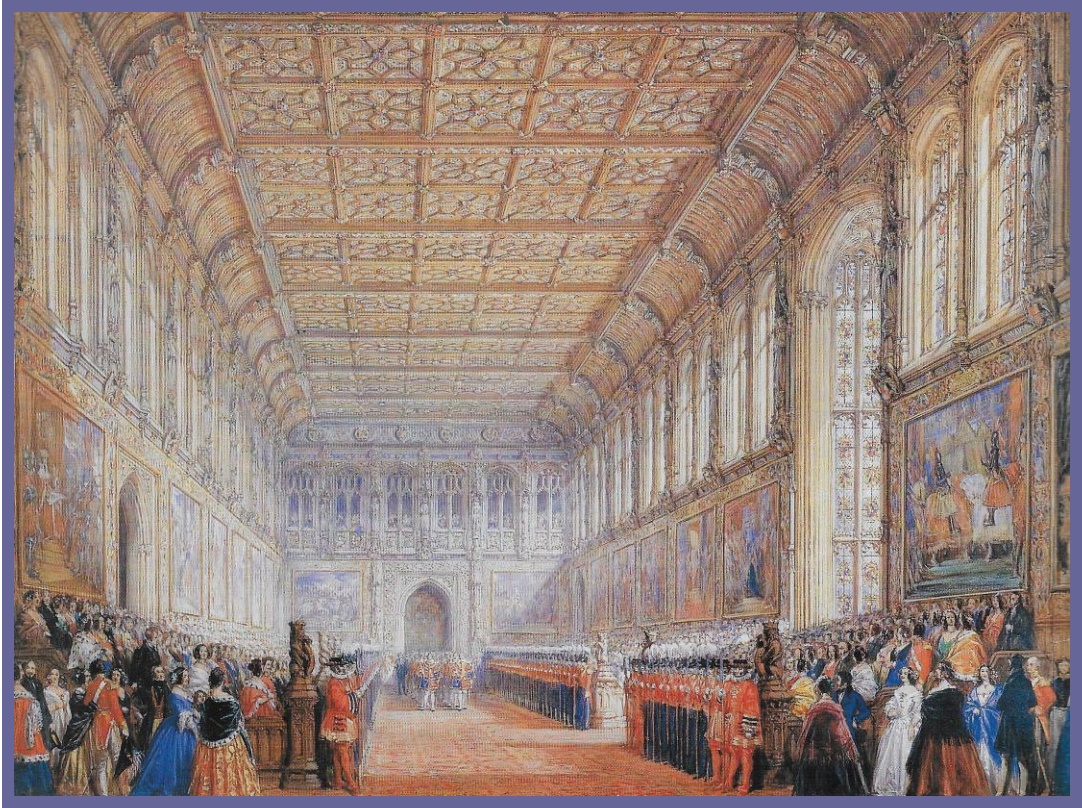
Dr James Boswell Reid was originally appointed to design the heating and ventilation of the new Parliament. However, both he and the architect Charles Barry failed to co-operate or even produce the drawings necessary for each of their works. Eventually, this resulted in Barry taking over responsibility for the heating and ventilation of the House of Lords, whilst Reid remained responsible for the House of Commons.

SOUTH WING TOWERS



The South Wing Towers, 1849.

HOUSE OF LORDS



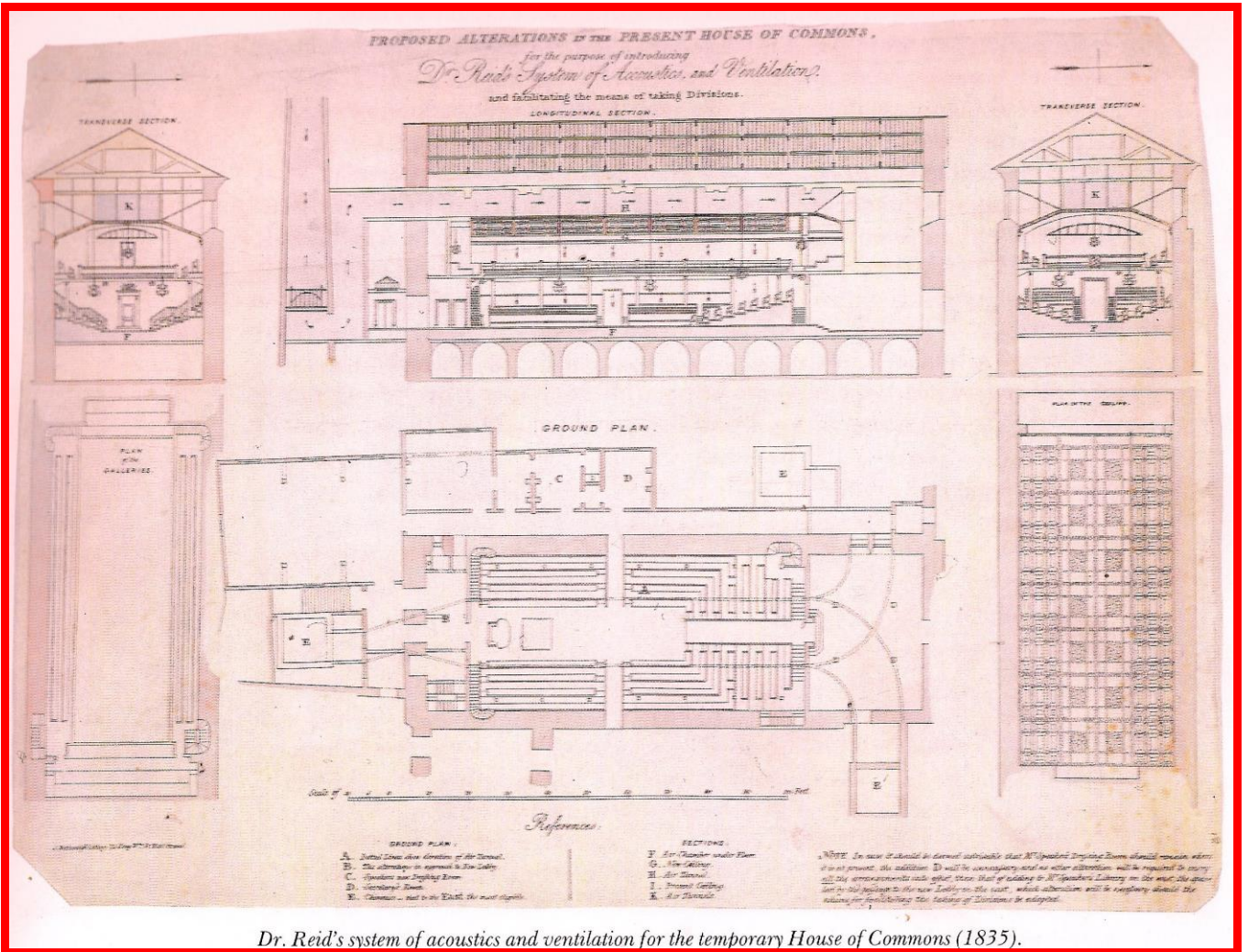
(a) Queen Victoria returning from the House of Lords after the Opening of Parliament (artist Joseph Nash).
(b) The proposed entrance to the House of Lords by architect Thomas Hopper.

HOUSE OF LORDS

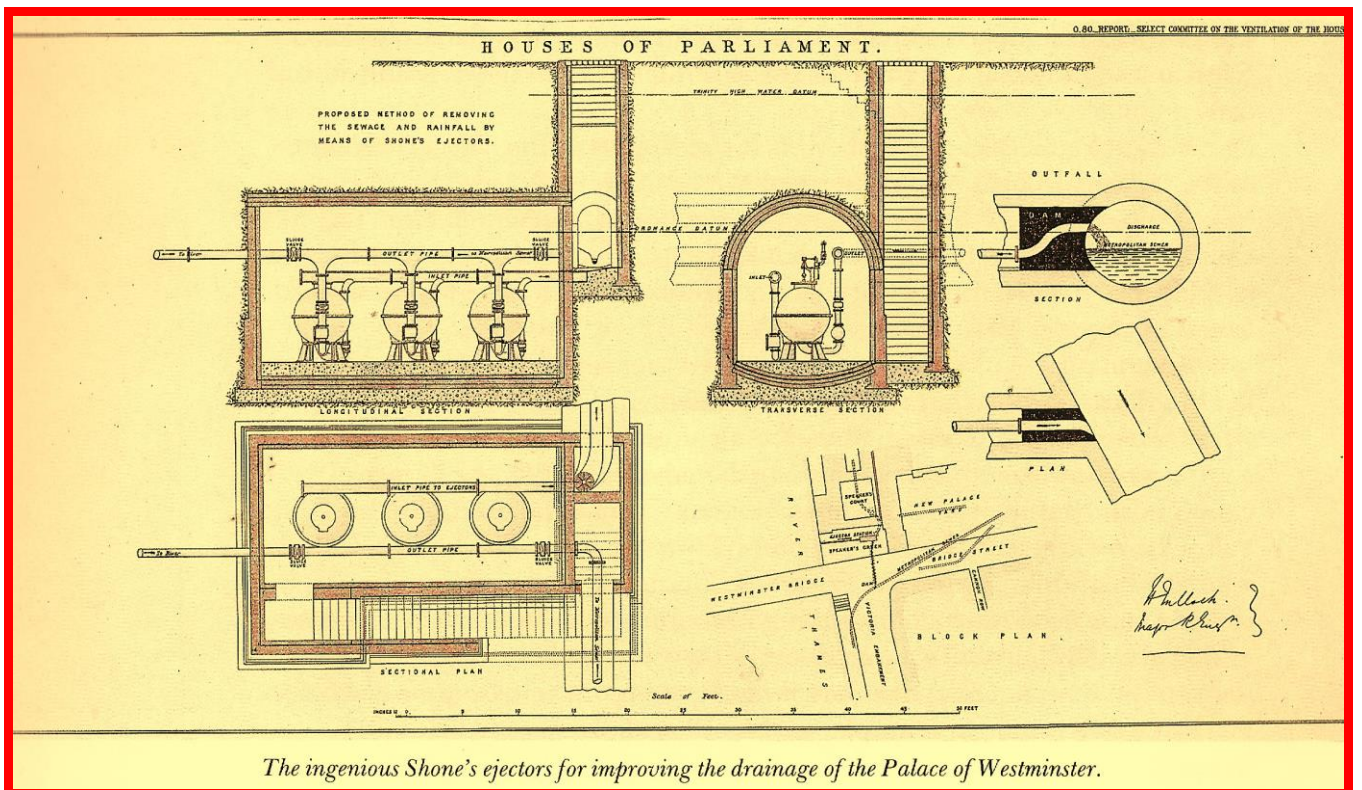


The interior of the House of Lords in 1847.

HEATING, ACOUSTICS AND SEWAGE EJECTORS

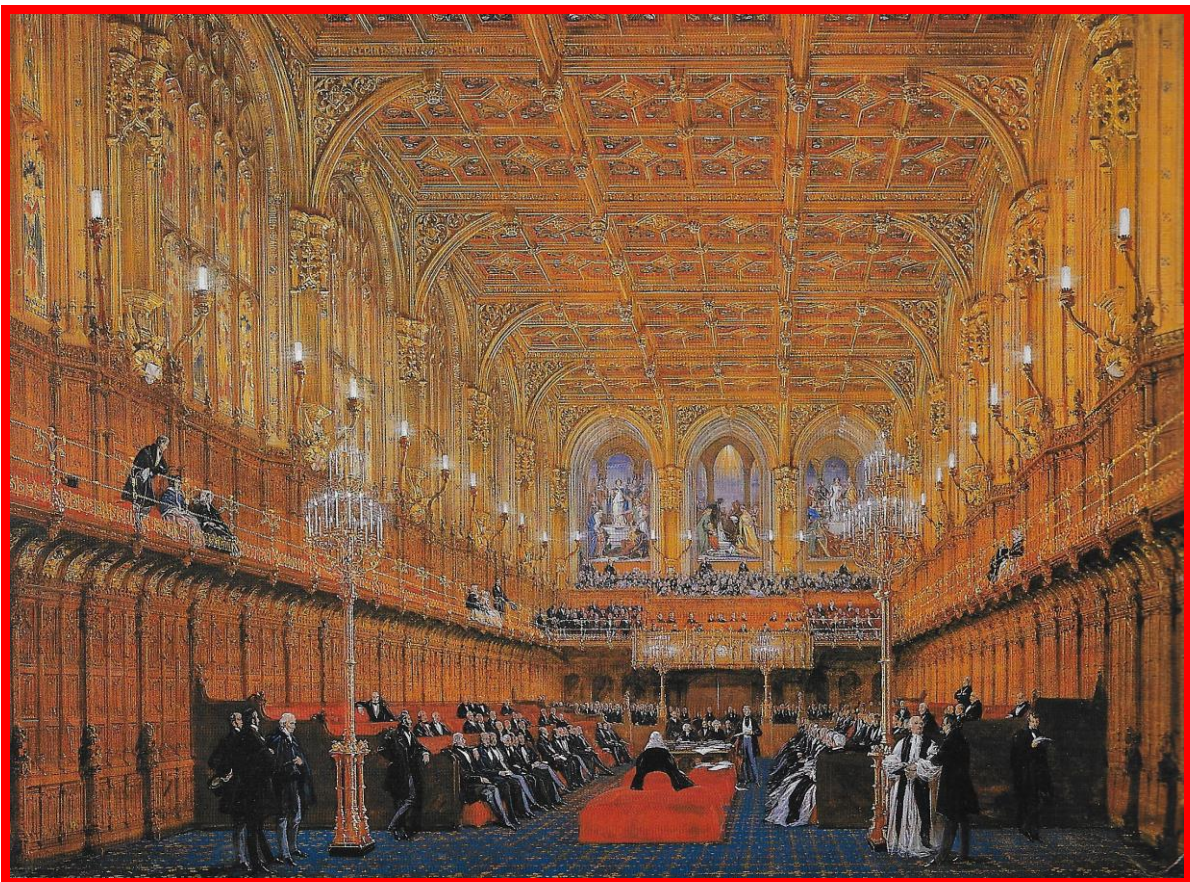
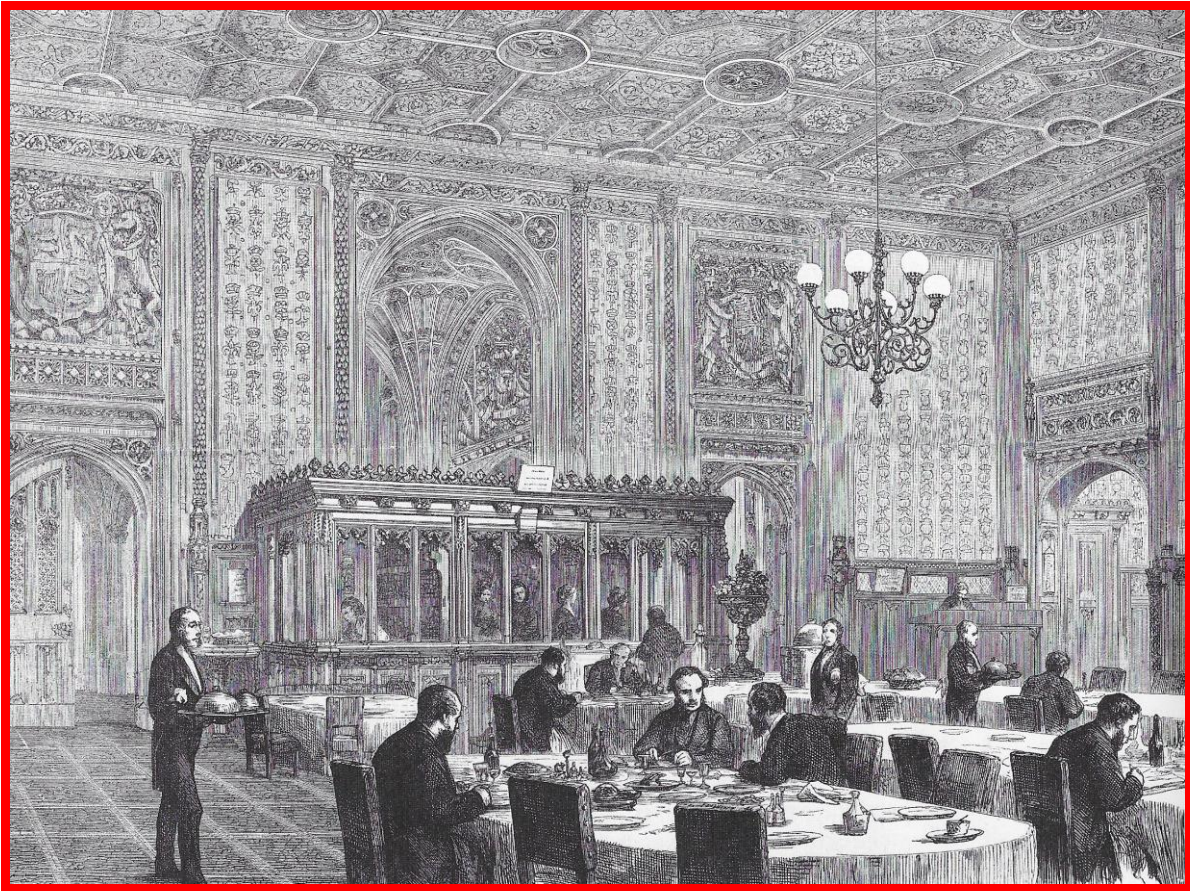


Dr. Reid's system of acoustics and ventilation for the temporary House of Commons (1835).



The ingenious Shone's ejectors for improving the drainage of the Palace of Westminster.

LIGHTING



(a) The Peers' refreshment room in 1854.

(b) The House of Lords lit by wall lights, 1851 (artist Joseph Nash).

WARMING, LIGHTING AND VENTILATION

Appendix B : Letter from Charles Barry to Lord Duncannon 3rd October 1839

Foley-place 3rd October 1839.

My Lord,

The time is now arrived when it is desirable to decide upon the system to be adopted for warming, lighting, and ventilating the intended New Houses of Parliament, as it is of great importance that every preparation should be made for the purpose in the progress of the intended buildings, so as to avoid considerable expense, and probably dissatisfaction hereafter. I should therefore wish to be put in communication with, or be empowered to apply to such persons as have distinguished themselves in that department of science, in order that a general system may at once be devised to meet the objects in view, that will not interfere in any degree, if it be possible, with the convenience or beauty of the intended building. Dr. Reid, who is well known to your Lordship, and whose success in warming and ventilating the present House of Commons is generally acknowledged, and Mr. Oldham, who has long been employed in the mechanical departments of the Banks of England and Ireland, which have been warmed and ventilated by him upon a new system with great success, are both persons who in all respects are eminently qualified to be employed upon this business ; but as Dr. Reid is a resident of Edinburgh, and does not profess to be thoroughly acquainted with the practical details of building and machinery, and as Mr. Oldham's official appointment at the Bank of England would prevent him from giving up much of his time to the execution of the work that may be necessary, I should wish also to have the further assistance of a practical engineer who has specially turned his attention to the subject, and whose duty should be to direct, superintend, and be responsible for the proper execution of all the works that may be requisite in carrying out the details of the system that may be agreed upon. For this office I beg to recommend Mr. Manby, of Great George-street, Westminster, who has long acted as the agent for Mr. Price's patent system of warming by hot water, in which capacity he has been employed at the British Museum, and many other public buildings, as well as at several of my own private works, in directing and superintending the application of that patent with great success.

I have the honour to be, my Lord, your very faithful and obedient servant,

CHARLES BARRY

Source : *The Second Report of the Committee of the House of Commons to consider the present state of Westminster Bridge and the New Palace of Westminster* (1846)

WARMING, VENTILATION AND LIGHTING

Appendix D: Mr. Goldsworthy Gurney's Report on the ventilation of the House of Commons (1852)

In obedience to the Order of your Honourable House, dated the 12th day of March 1852, I beg to Report, That I am investigating the arrangements for the warming, ventilating, and lighting the New House of Commons; and, having been given to understand by several Members that it would be acceptable to The House that I should make a First Report on the state of the Ventilation as early as possible, I beg further to Report as follows:

That, although I have been interrupted in my investigations, and thereby prevented from making them as full and complete as I could have wished, I have seen sufficient to satisfy myself of the causes of the great inconvenience experienced at this moment.

That I find the atmosphere of the House in a dessicated and oppressive state, and subject to constant disturbance from initial and retrograde currents passing in all directions, as if at random, and apparently without control, producing direct draughts in particular parts of the House, and oppression in others. I also find that from the same want of proper control, offensive vapours and effluvia (emanating from contaminated sources) are drawn into the House.

That most of these evils can be corrected by a simple arrangement, and at an expense comparatively trivial, and although this is a common-sense question, yet it would be difficult to demonstrate it on paper unaccompanied by actual experiment, or to explain the facts and conditions on which this conclusion is arrived at. And inasmuch as on former occasions an unfair advantage has, I think, been taken of the statements and evidence which I have given from time to time, and portions of my plans have been adopted without consulting me, I am induced to ask permission to refrain from entering into details at present.

The principles of ventilation which have been recommended by me, and, to the best of my belief, acted upon in the Chamber of Deputies at Paris, and now in operation in the Courts of Exchequer and Commons Pleas in Westminster Hall (which courts were previously unsatisfactorily ventilated by a similar arrangement to that now applied to this House), and their success in every Court of Judicature, and other places in the provinces to which they have been extended, afford sufficient evidence (in addition to what I have seen in this House) to justify me in saying, that if the House be placed under the control of the Office of Works for a short time, I would pledge myself, with their assistance, to remove all the material evils that at present exist, at a very trifling expense; and at the expiration of such control, to restore the ventilation, if required, to its present state, within the space of a few hours.

Of course it will be understood that this Report applies only to the House itself, and not to the entire building.

GOLDSWORTHY GURNEY

5 April 1852

VENTILATION AND LIGHTING

Appendix E: Mr. William Molesworth's Report on the ventilation and lighting of the House of Commons (1853)

The Committee reports, that the alterations that have been made in the mode of ventilating the House have been in accordance with a Report presented to the Board of Works by Mr. Meeson, and have had the cognizance and sanction of the Committee. They consist principally in covering with lead that portion of the perforated floor which is usually walked upon, to prevent dust being carried upwards, and to obviate also the inconvenience felt from currents of air; in substituting openings for free admission of air in all available positions in the risers of steps and gangways; in cleansing, raising, and putting in good order the air channels or the vaults, &c.; in fixing screens for purifying and moistening the air; in laying on water, and making arrangements for washing, moistening and cooling the channels and chambers; in examining and cleansing the drains; in improving and putting in order the steam-boilers, and the apparatus connected therewith; and in making provision for a certain supply of air from the ceiling.

The ventilation of the House has been interfered with during the progress of the alterations required for the introduction of the system of lighting of Mr. Gurney, and much dust has necessarily been made by workmen constantly employed nearly up to the hour of The House meeting.

The Lighting of Dr. Reid has been removed, and the present system substituted by Mr. Gurney, under the direction of the Chief Commissioner.

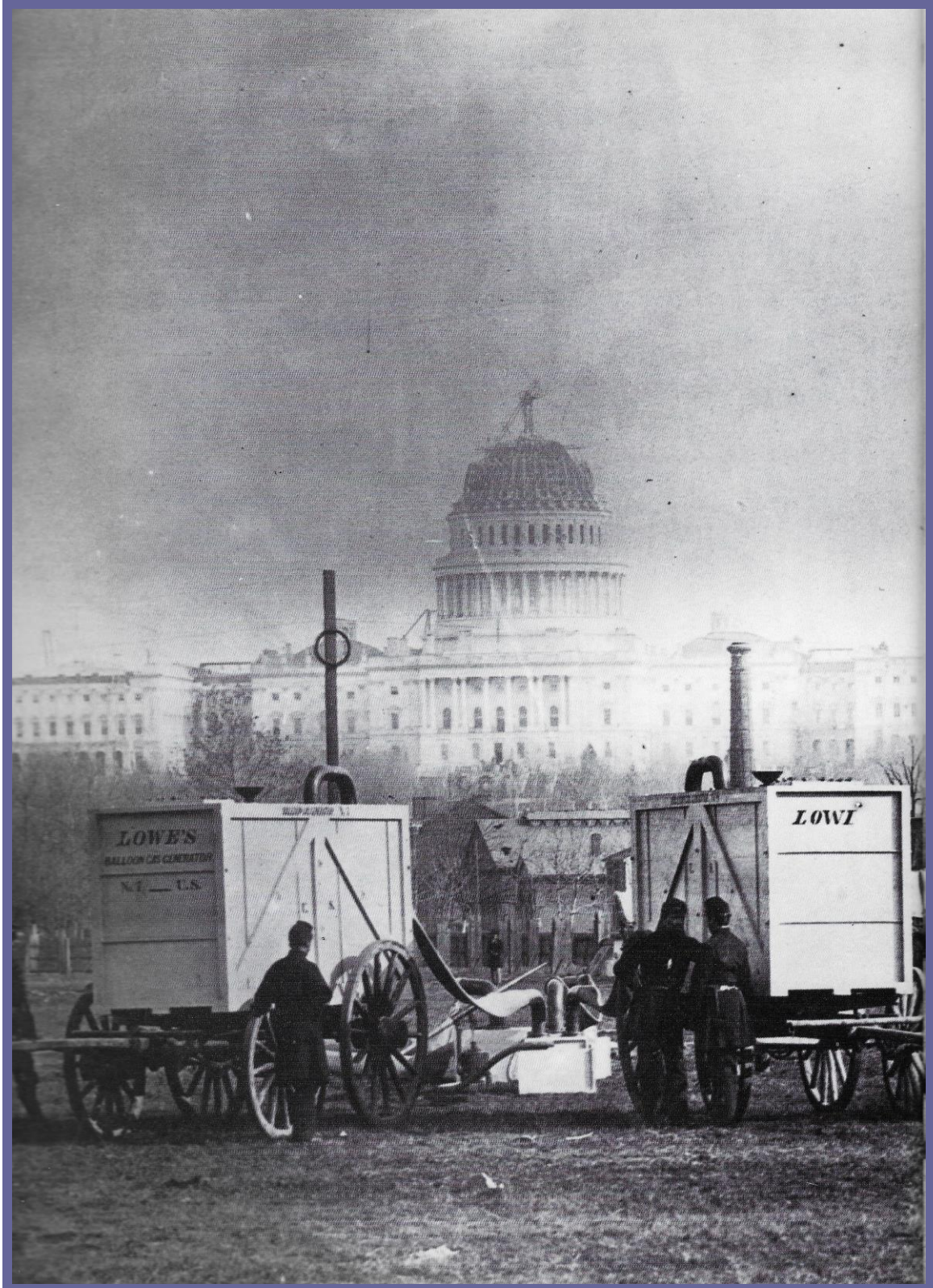
Members of the House will be competent to judge of the quality of the Lighting; but there are other considerations connected with this part of the subject, viz., the heat produced by the combustion of so large a quantity of gas as is required to attain the transmission of sufficient light through the ground-glass panels, the effect of the heat on the House by radiation downwards from the roof, and also on the ventilating arrangements, which will have the careful attention of the Committee.

The charge of the Lighting and Ventilation is now entirely under the control of Mr. Meeson, but he is not empowered to make any alterations in the arrangements without the sanction of the Chief Commissioner of Works.

WILLIAM MOLESWORTH
(Chairman)

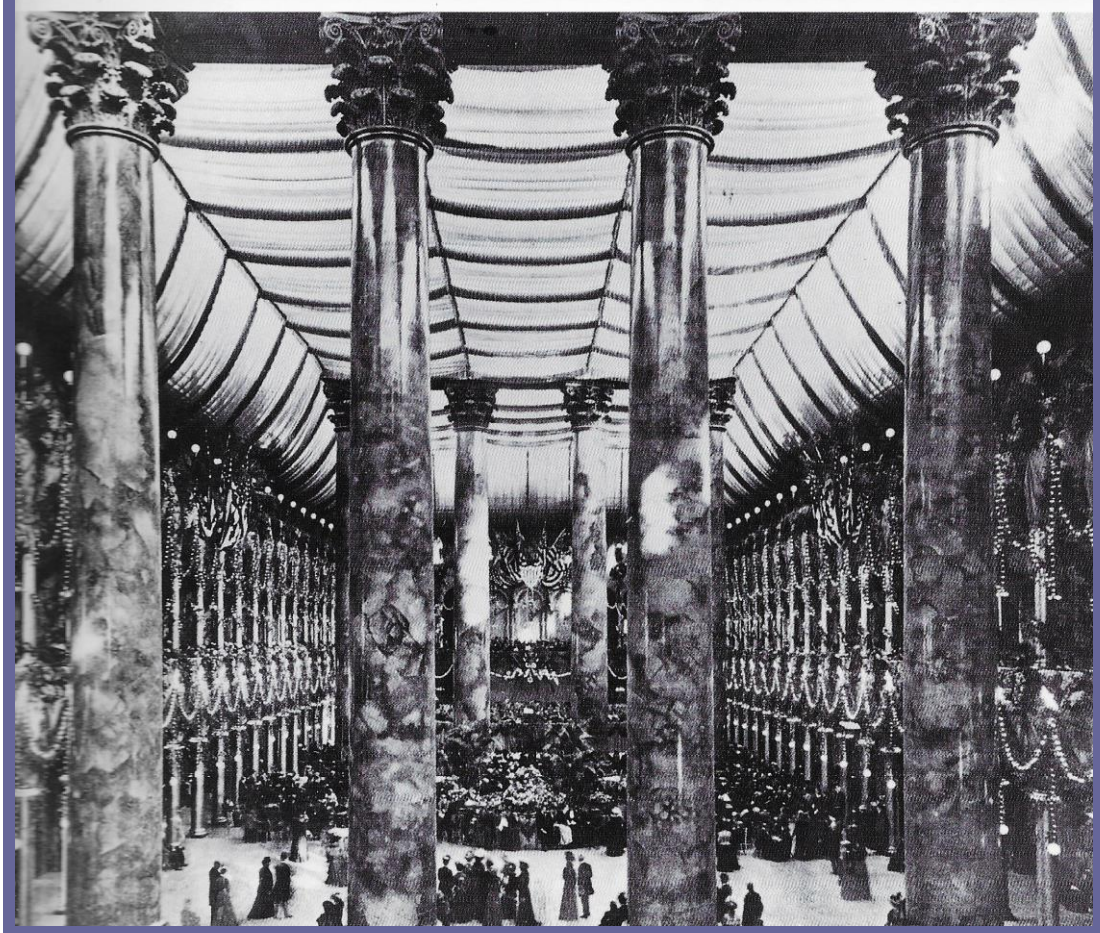
THE UNITED STATES

CAPITOL DOME WASHINGTON



The original wooden dome was replaced in 1860-63. Architect: Thomas U. Walter.
The new dome was 287 ft high, 135 ft diameter at the base and topped with the 19.5 ft bronze statue *Freedom*.
The dome is made of cast-iron, painted to resemble stone.

PENSION BUILDING WASHINGTON



Constructed 1882-87 using 15.5 million red bricks, Architect: General Montgomery C. Meigs. Design inspired by the Palazzo Farnese in Rome. Innovations included double-glazing to reduce summer heat and a central clerestory providing natural light and good ventilation. Now the National Building Museum.

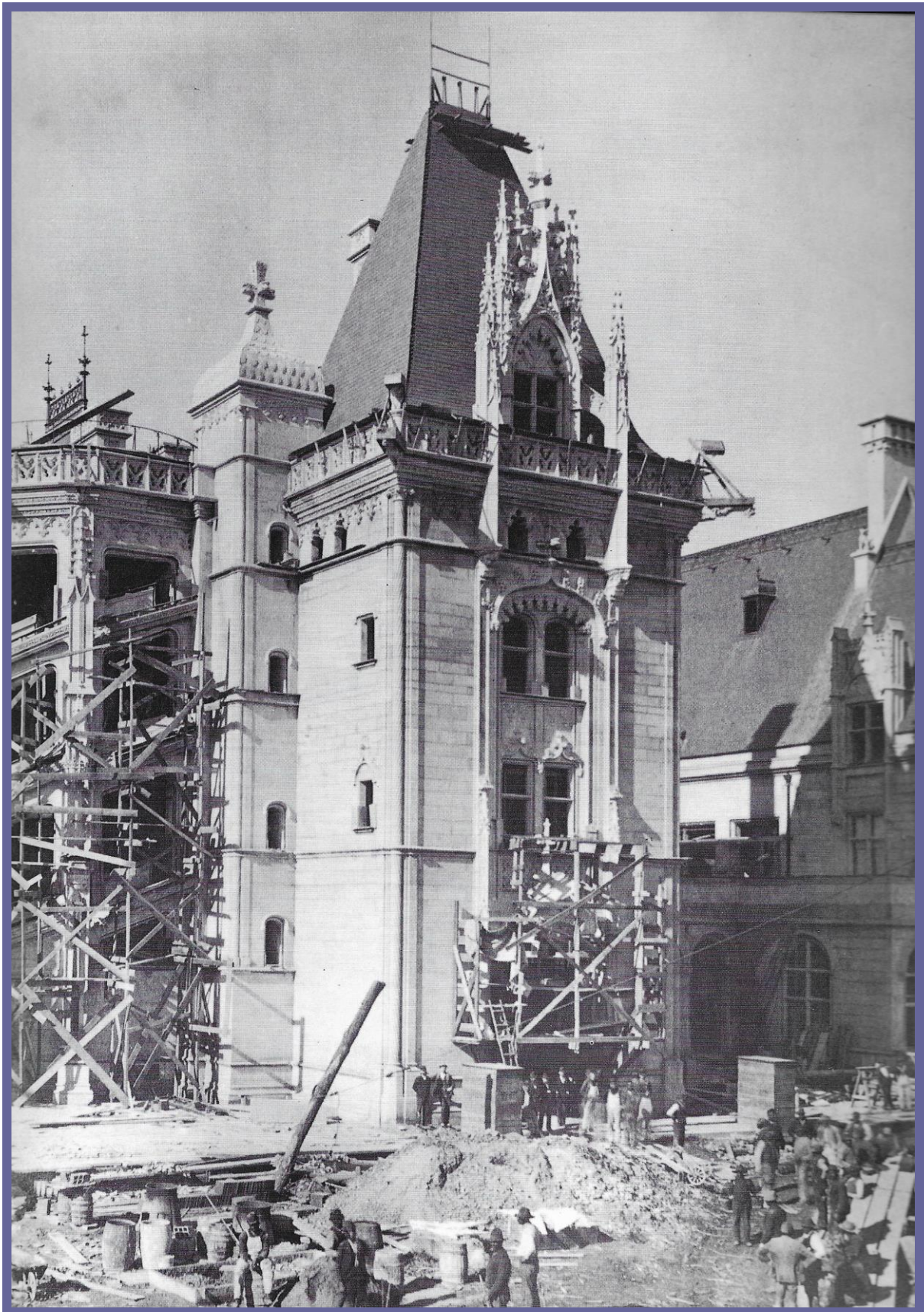
STATUE OF LIBERTY NEW YORK HARBOUR



Height: Foundation to torch 305 ft. Titled *Liberty Enlightening the World*.
Designed by Frederic Auguste Bartholdi and Alexandre-Gustave Eiffel.

Visited by the author in 1975.

BILTMORE ESTATE ASHVILLE NORTH CAROLINA



The largest of America's large houses, constructed 1890-95. Architect: Richard Morris Hunt.

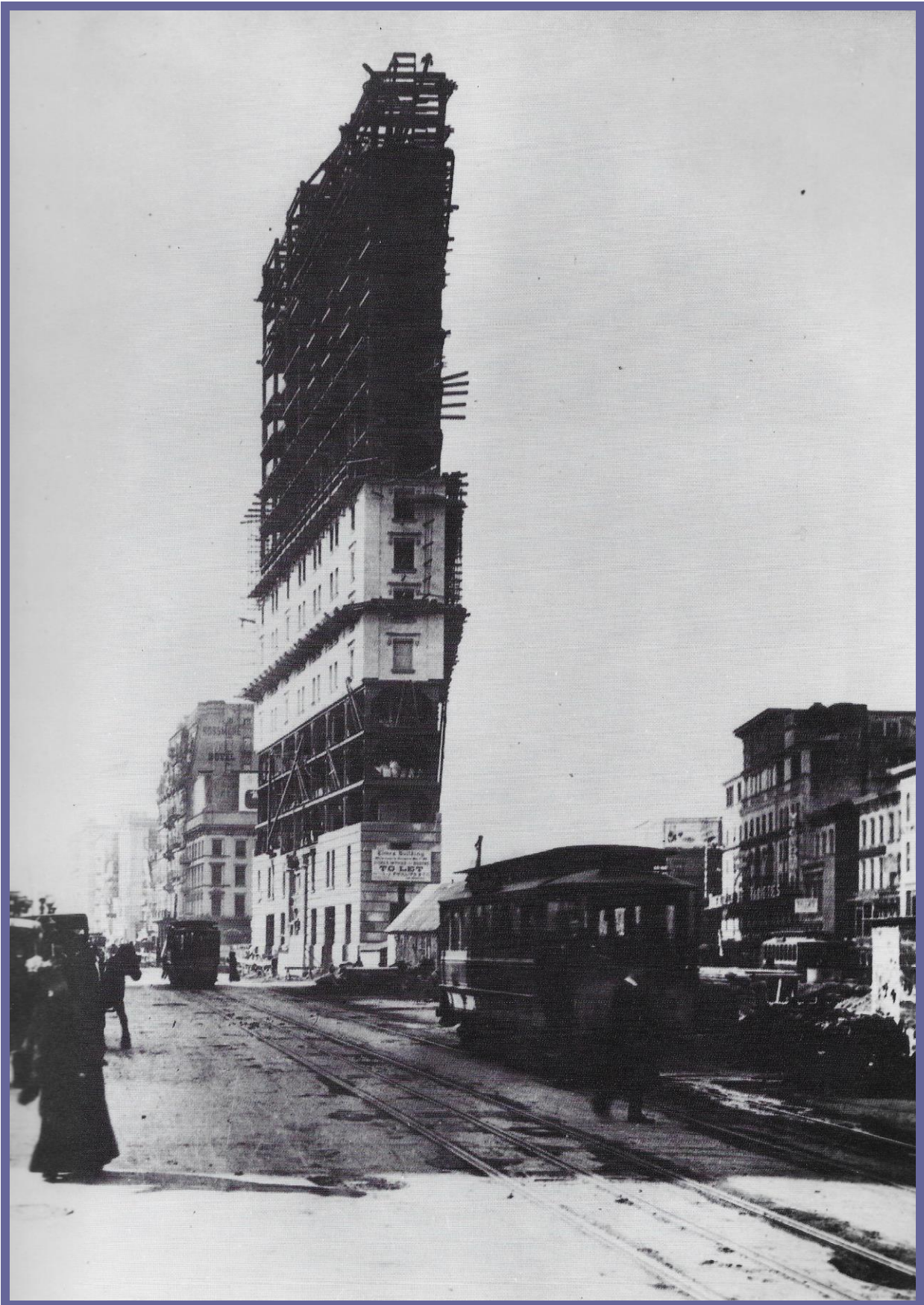
The house sat in a self-sufficient estate of some 125,000 acres, supplying its own food and much of its power and had a complex heating system, plumbing, elevators, dumbwaiters, an elaborate fire-alarm system and mechanical refrigeration.

FLATIRON BUILDING NEW YORK



Built 1901-02. Architect Daniel H. Burnham. Real name was the Fuller Building, 300 ft tall. A steel-framed skyscraper clad in limestone.

TIMES TOWER NEW YORK



Built 1905 for the *New York Times*. Architect: Cyrus Lazelle Warner Eidlitz.
Around 1928, had an electronic news sign consisting of 15,000 20-watt light bulbs
"controlled by a mechanical computer."

GOODYEAR AIRDOCK AKRON OHIO



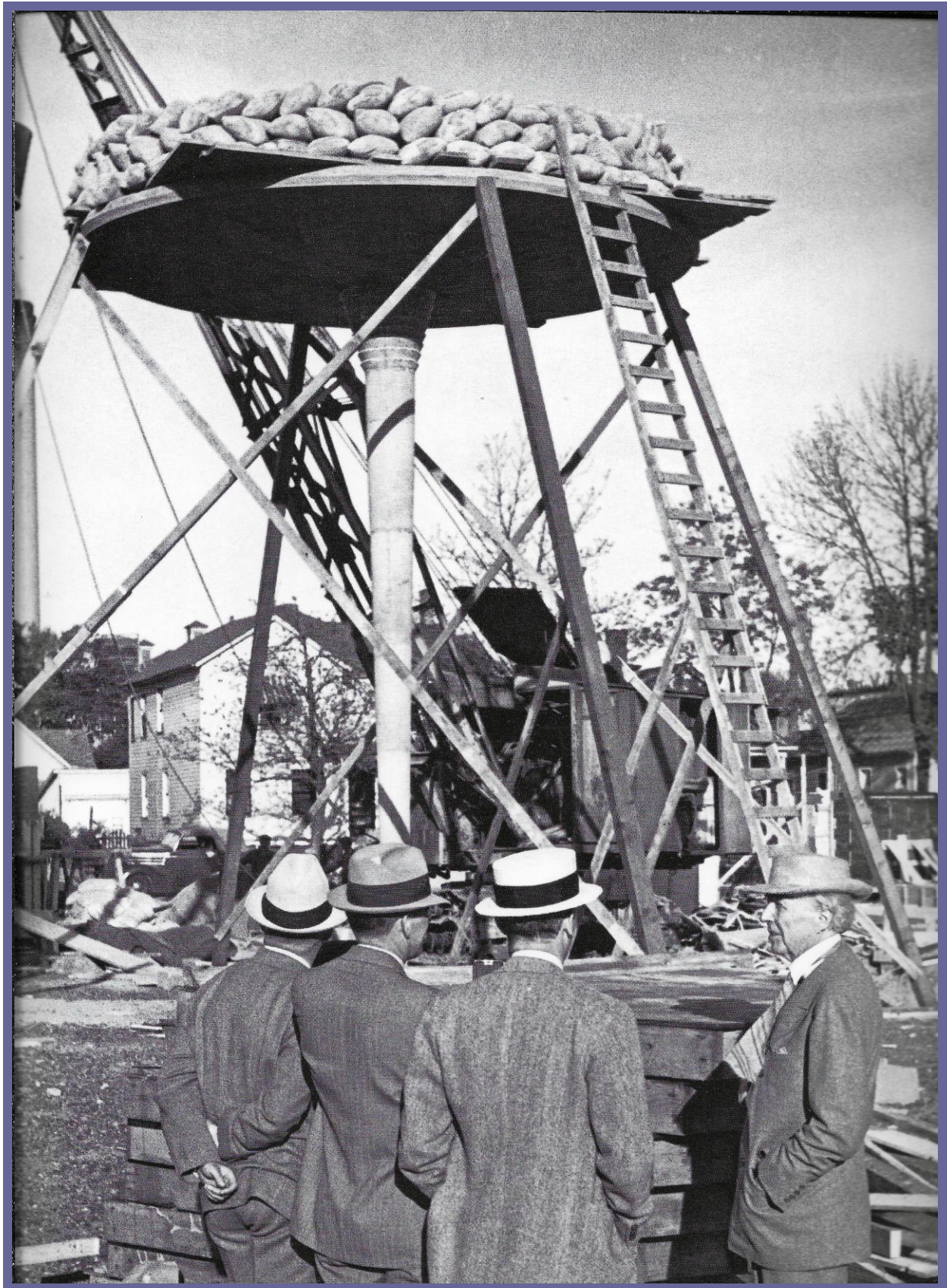
Commissioned by the U.S. Navy. Built 1928-29 by the Goodyear-Zeppelin Corporation to house two giant airships. The Airdock was 1177 ft long, 325 ft wide and 211 ft high and railway tracks led inside. The era of the dirigible (airship) ended with the explosion of the *Hindenburg* as it approached a mooring mast at Lakehurst, New Jersey on 6 May, 1937.

FALLINGWATER BEAR RUN PENNSYLVANIA



Built 1936-37. Architect: Frank Lloyd Wright. Regarded as one of the most notable works of domestic architecture. Not so well known is that it suffered a number of minor structural difficulties. However, "The architect and his client knew the design of Fallingwater was an exploration beyond the limits of conventional practice... many now accepted as normal."

JOHNSON WAX RACINE WISCONSIN



Built 1936-39. Architect: Frank Lloyd Wright. His design for the structural mushroom-shaped columns, (wide at the top and tapering to very narrow at the bottom) supporting the roof caused considerable concern. As shown in the photograph, Wright had a prototype column constructed and had it loaded to 12 times the load it was calculated to carry. It passed the test and construction proceeded. Another innovation was the use of Pyrex glass tubing to provide natural roof lighting into the large central open-office space.

ROCKEFELLER CENTRE ICE RINK NEW YORK



The Centre opened in 1934, the Plaza ice-rink in 1936. The bronze-gilded statue is *Prometheus*.

The author visited in 1976.

MARINA CITY CHICAGO



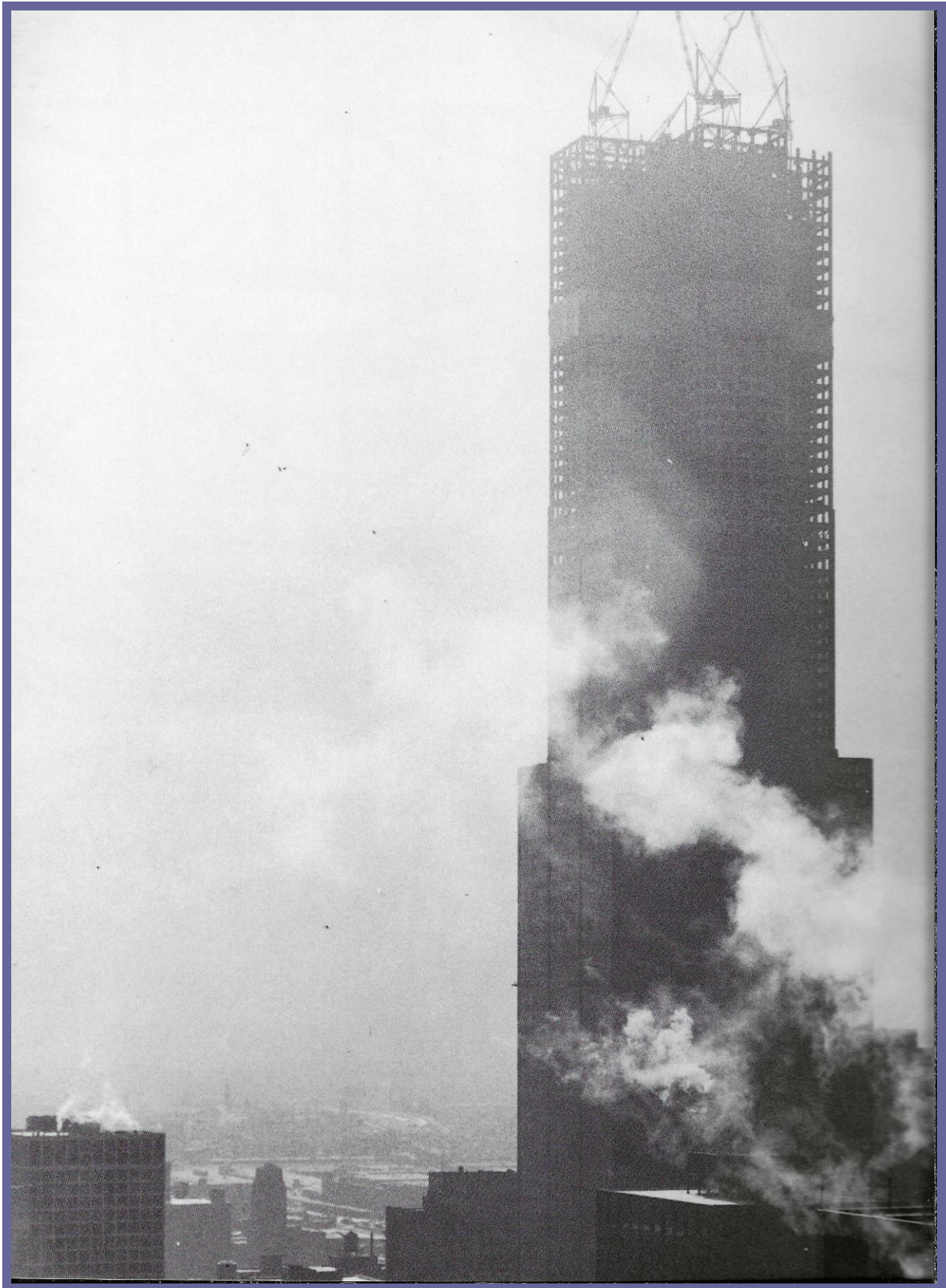
Built 1964. 588 ft high, 61 floors. Architect: Bertrand Goldberg. Lower 18 floors car parking. Upper floors apartments with individual heating and cooling units (no central plant).

JOHN HANCOCK BUILDING CHICAGO



Built 1966-70. Architect Bruce Graham of Skidmore, Owings & Merrill. 1107 ft high. Comprises 5 lower floors of retail shops; floors 6-12 parking for 1200 cars; 13-17 offices and mechanical services; 18-41 offices; equipment 42-43; 44-45 sky lobby; 45-92 apartments; 93-95 observation lounge & restaurant; 95-100 mechanical & TV equipment. Perimeter induction (changeover) air conditioning with interior zone constant volume reheat system. Refrigeration 6900 TR. Interior later changed to VAV without reheat.

SEARS TOWER CHICAGO



Built 1970-74. Architect Bruce Graham of Skidmore, Owings & Merrill.
Height 1454 ft. Tallest building in the world 1974-1997. Refrigeration 17,000 TR.
HVAC Consultant: Jaros, Baum & Bolles. Originally had perimeter induction unit air conditioning,
now replaced with fan-coil units and automatic control system upgraded.

The author visited Sears Tower in 1979.



1892- Cathedral of St. John the Divine, New York.

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The Churchill Arch in the Houses of Parliament
presented by Sir Giles Gilbert Scott.