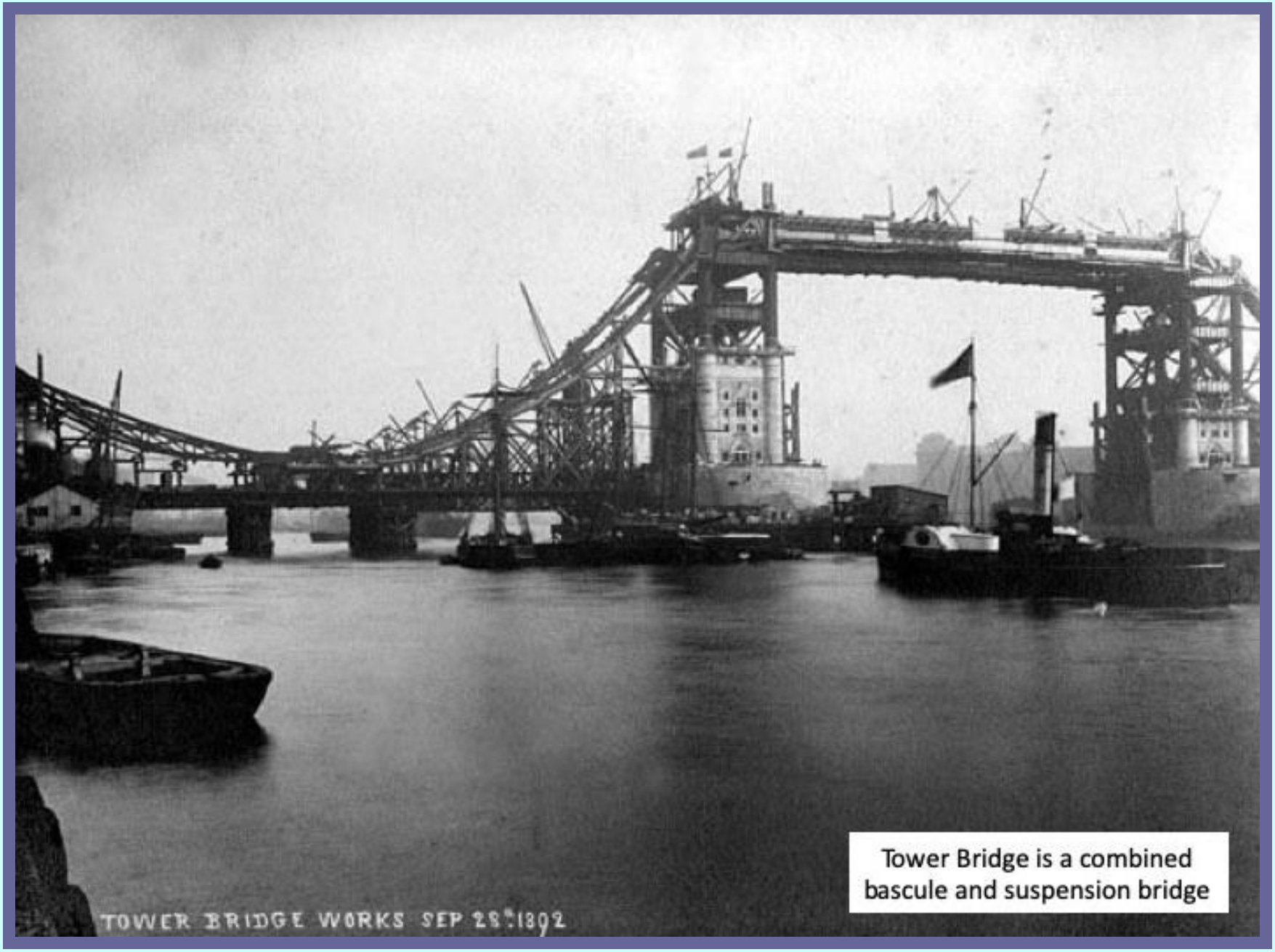
THE GAS LIGHTNG OF TOWER BRIDGE

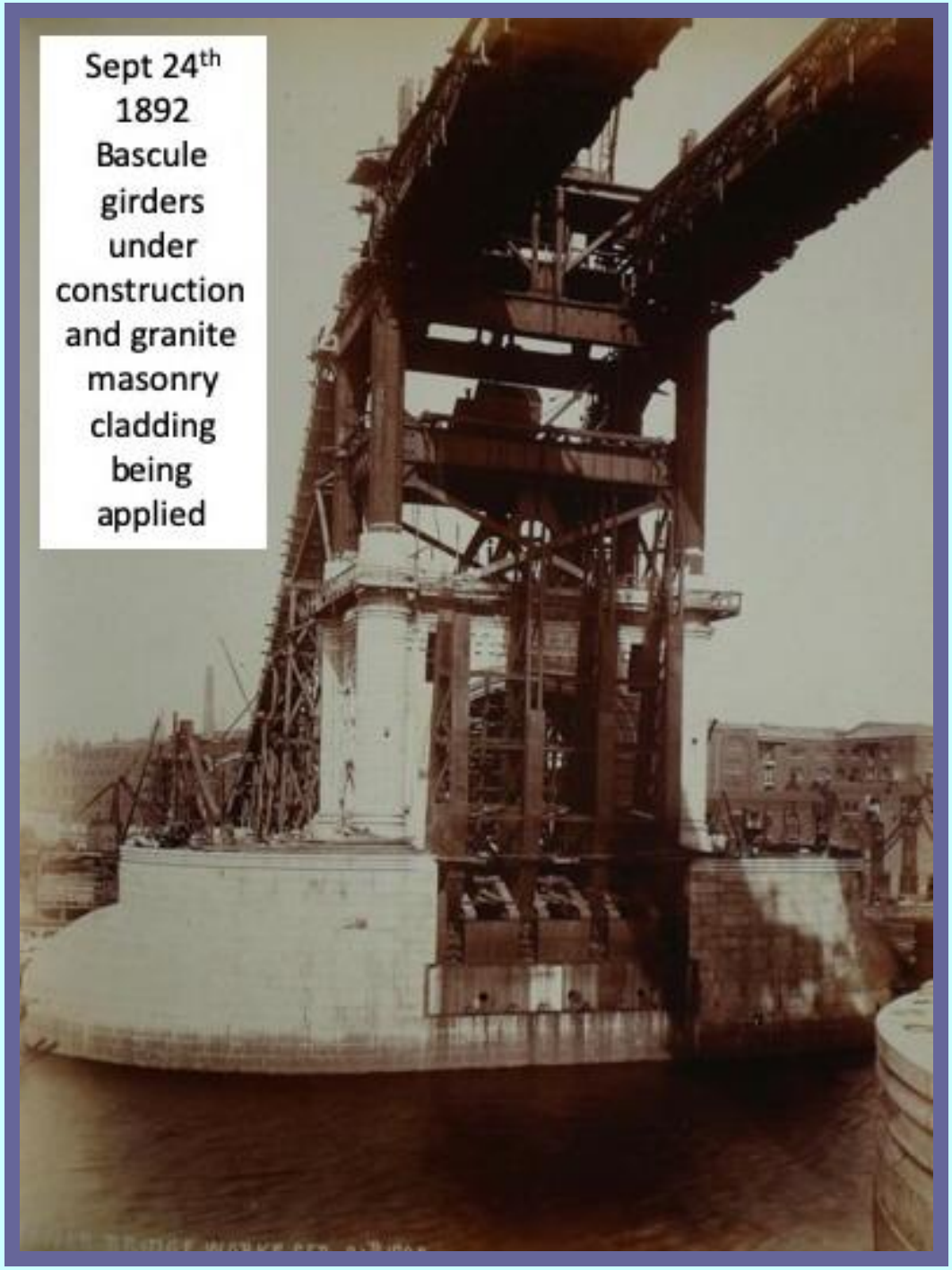
From 1864, relit 1901 and upgraded all the way to 1966

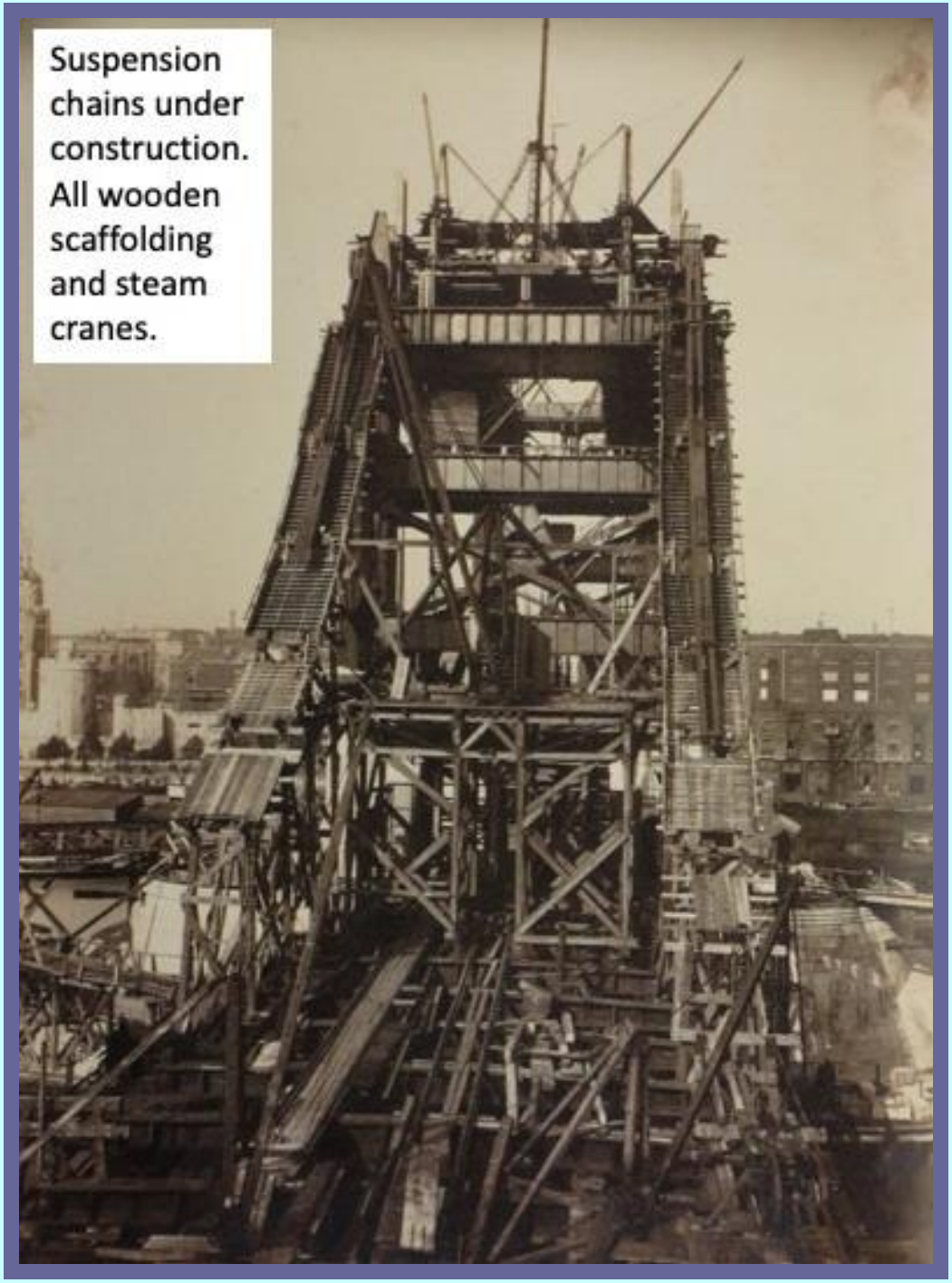
CHRIS SUGG


View from the Shard

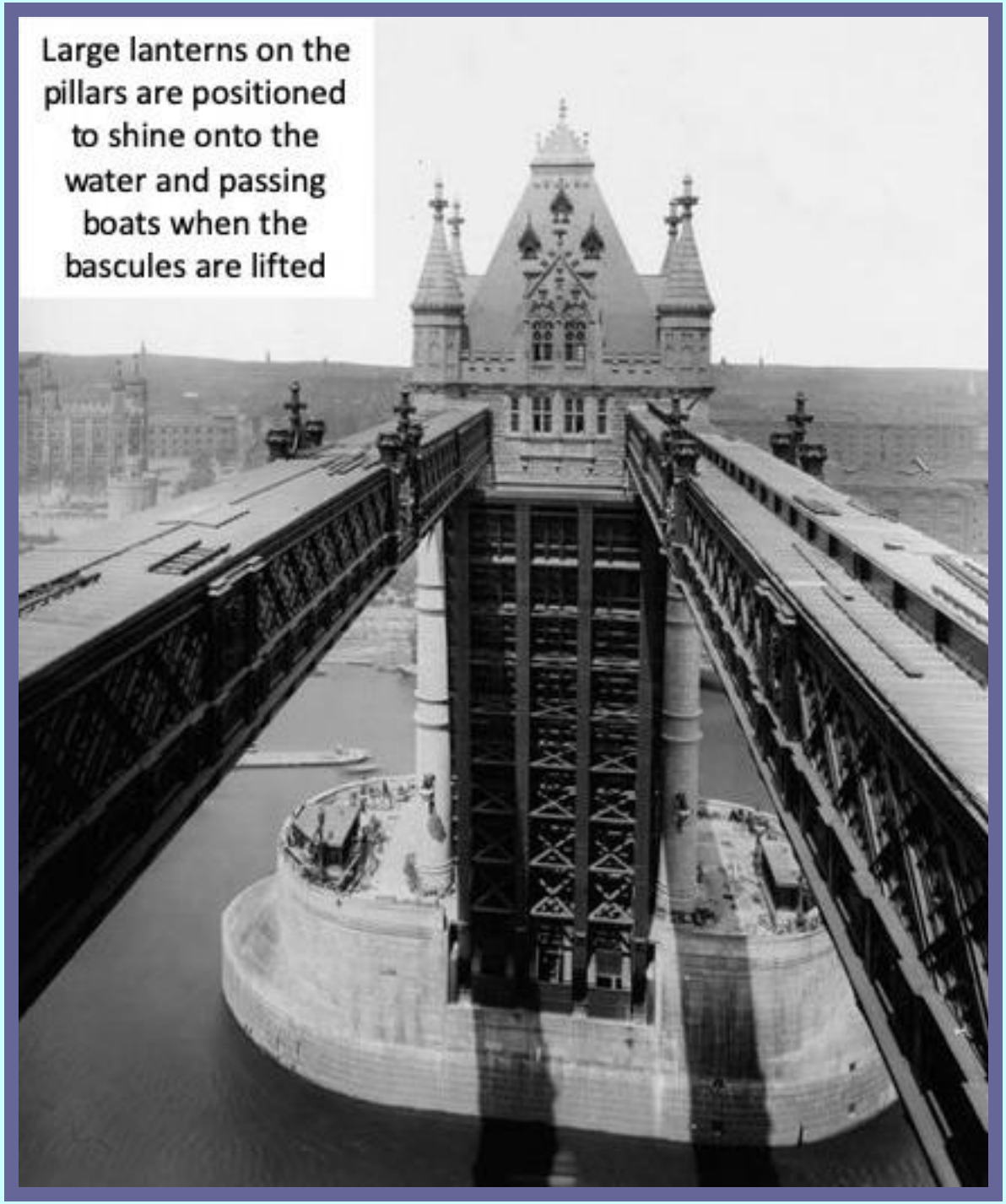
DESIGN AND CONSTRUCTION

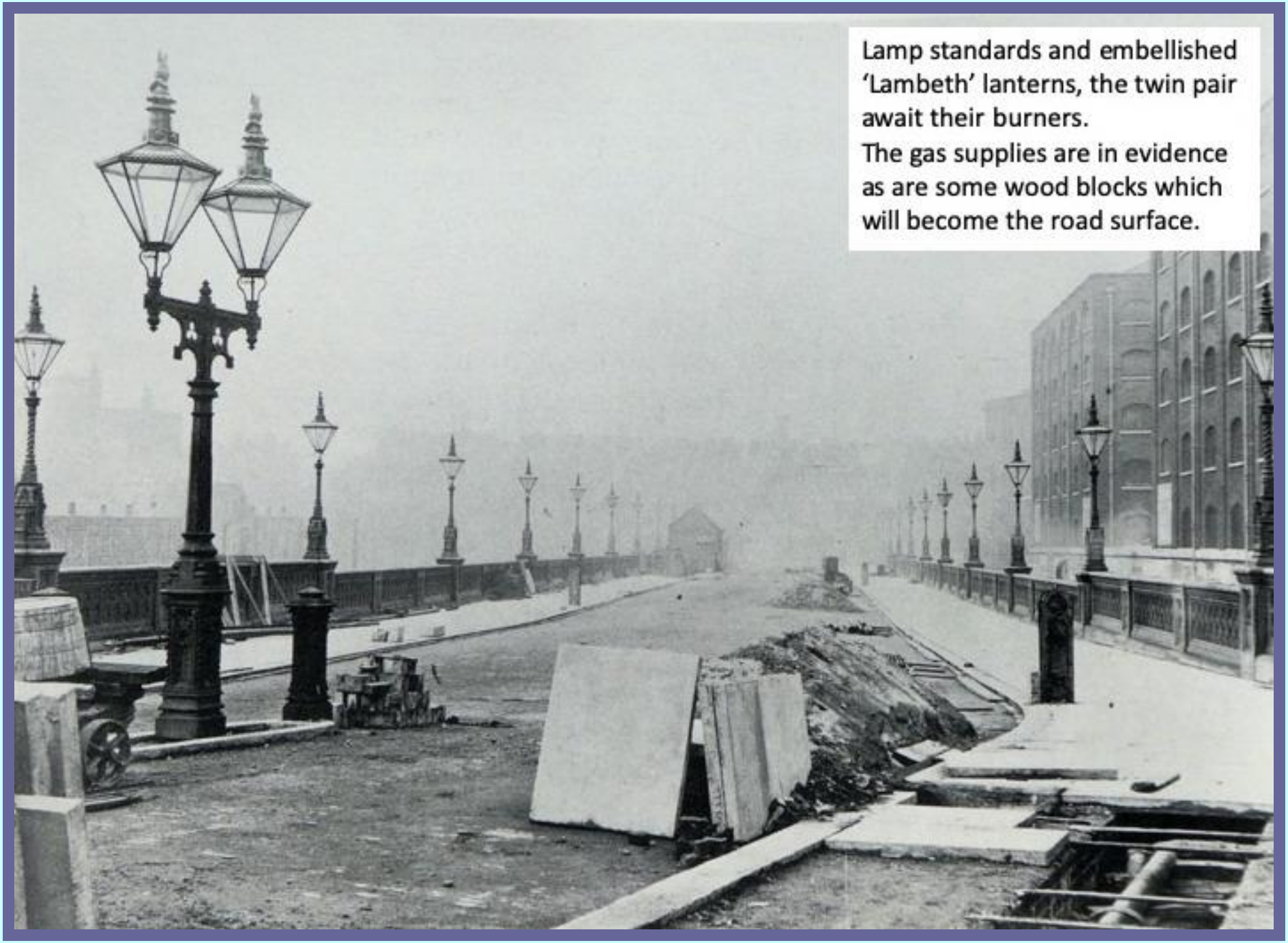


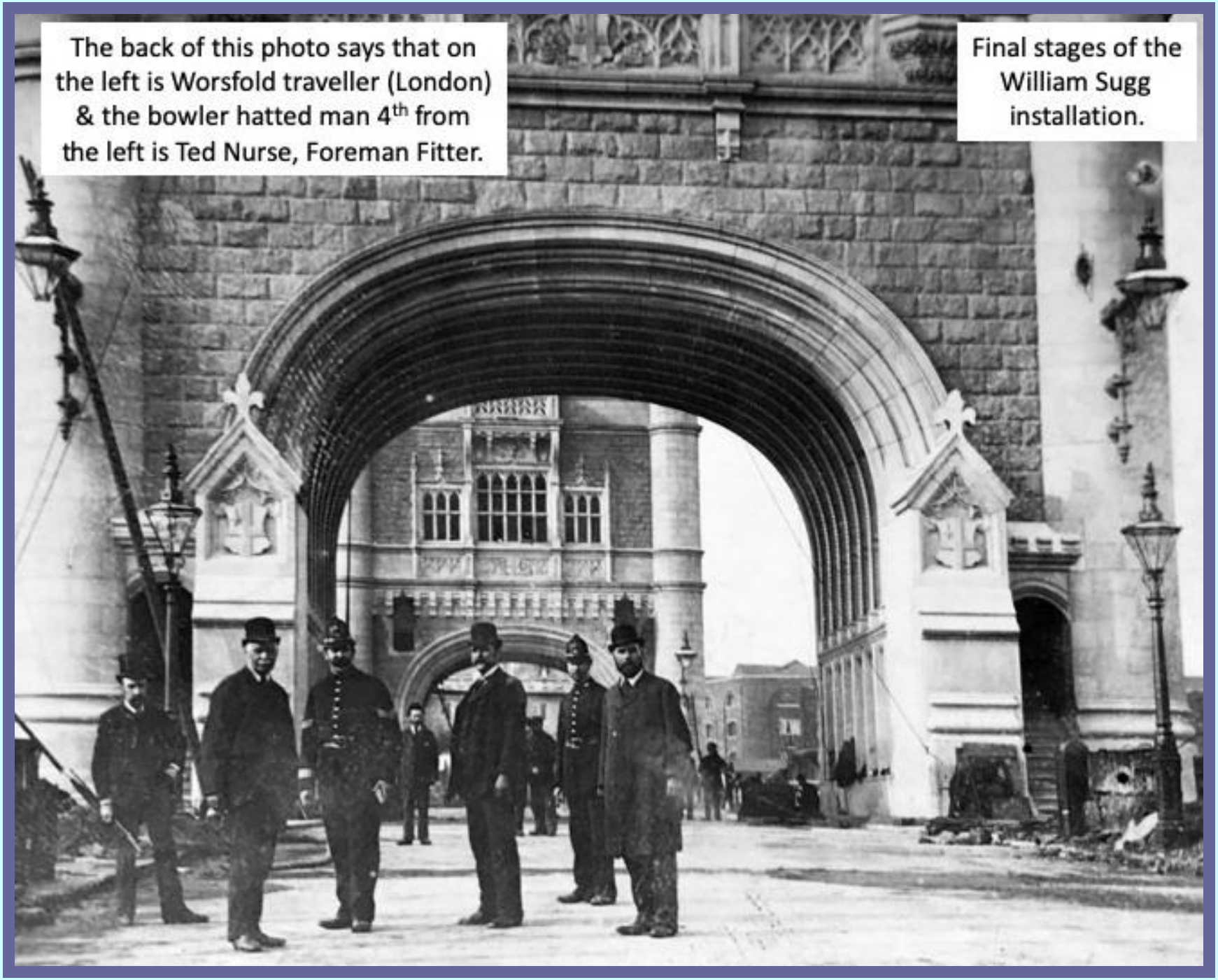

Sept 24th
1892
Bascule
girders
under
construction
and granite
masonry
cladding
being
applied


Suspension chains under construction. All wooden scaffolding and steam cranes.


1893 Progress with towers
now clad and suspension
chains in place.

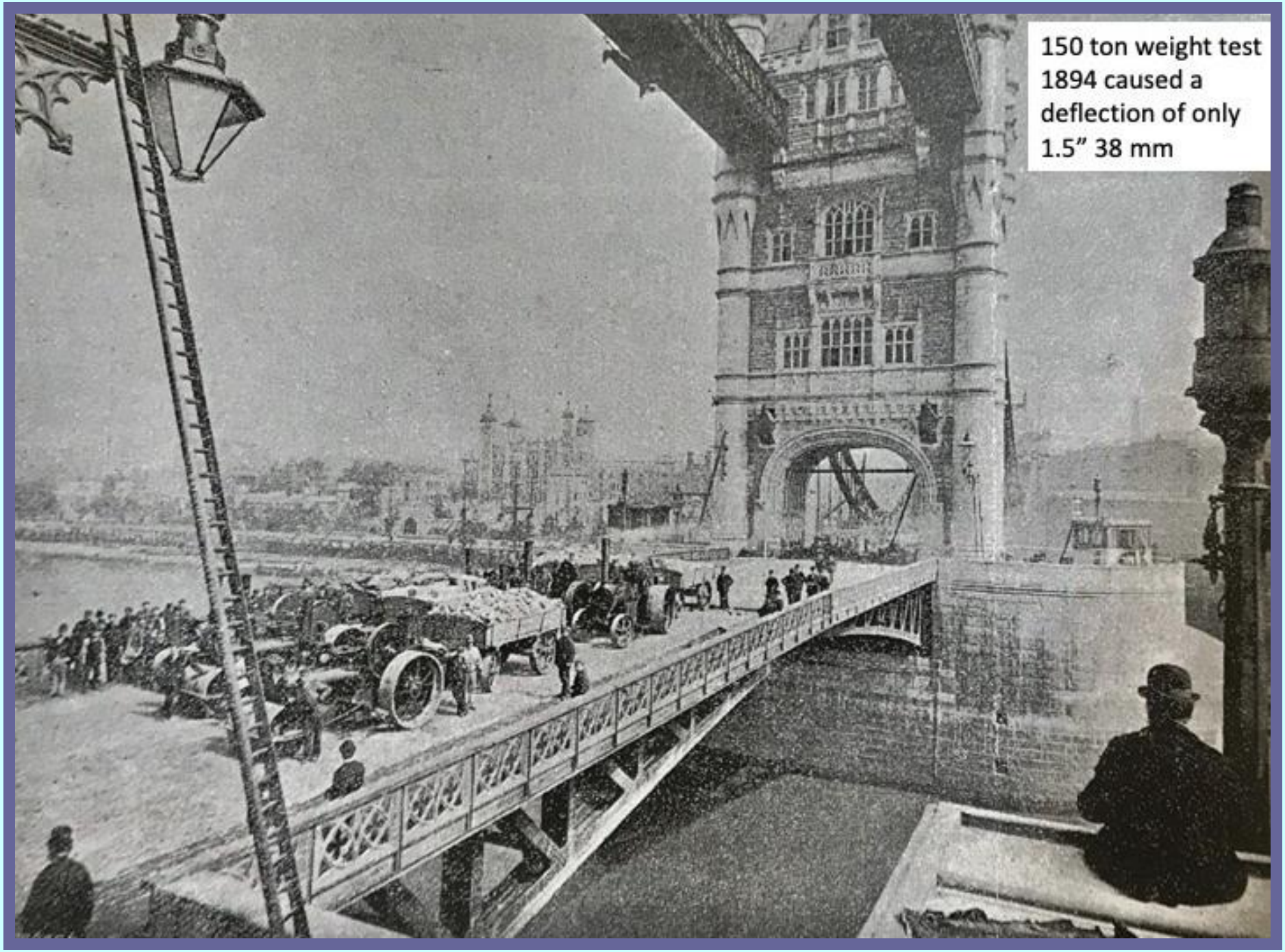

Large lanterns on the pillars are positioned to shine onto the water and passing boats when the bascules are lifted

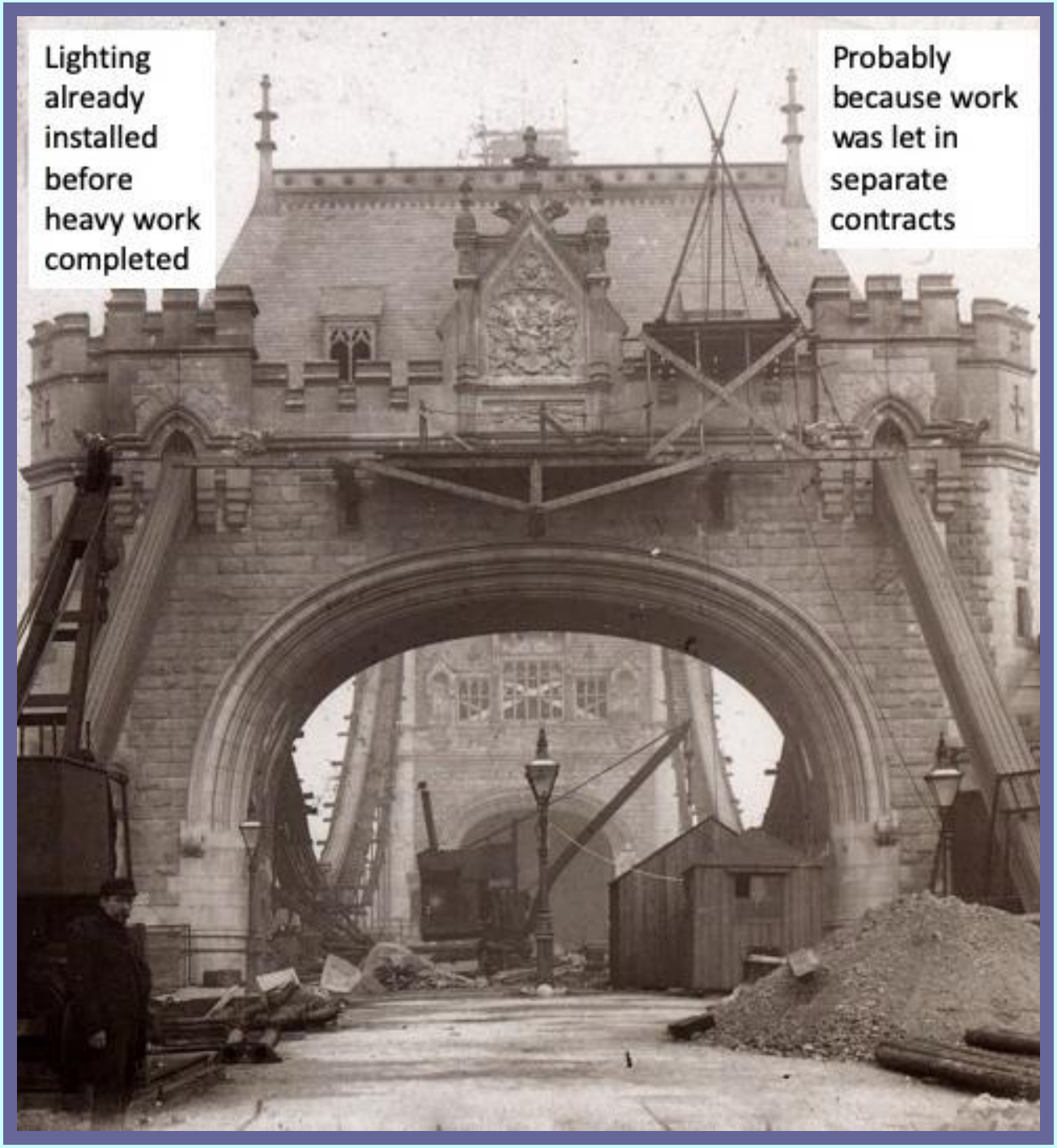

Lamp standards and embellished 'Lambeth' lanterns, the twin pair await their burners.
The gas supplies are in evidence as are some wood blocks which will become the road surface.

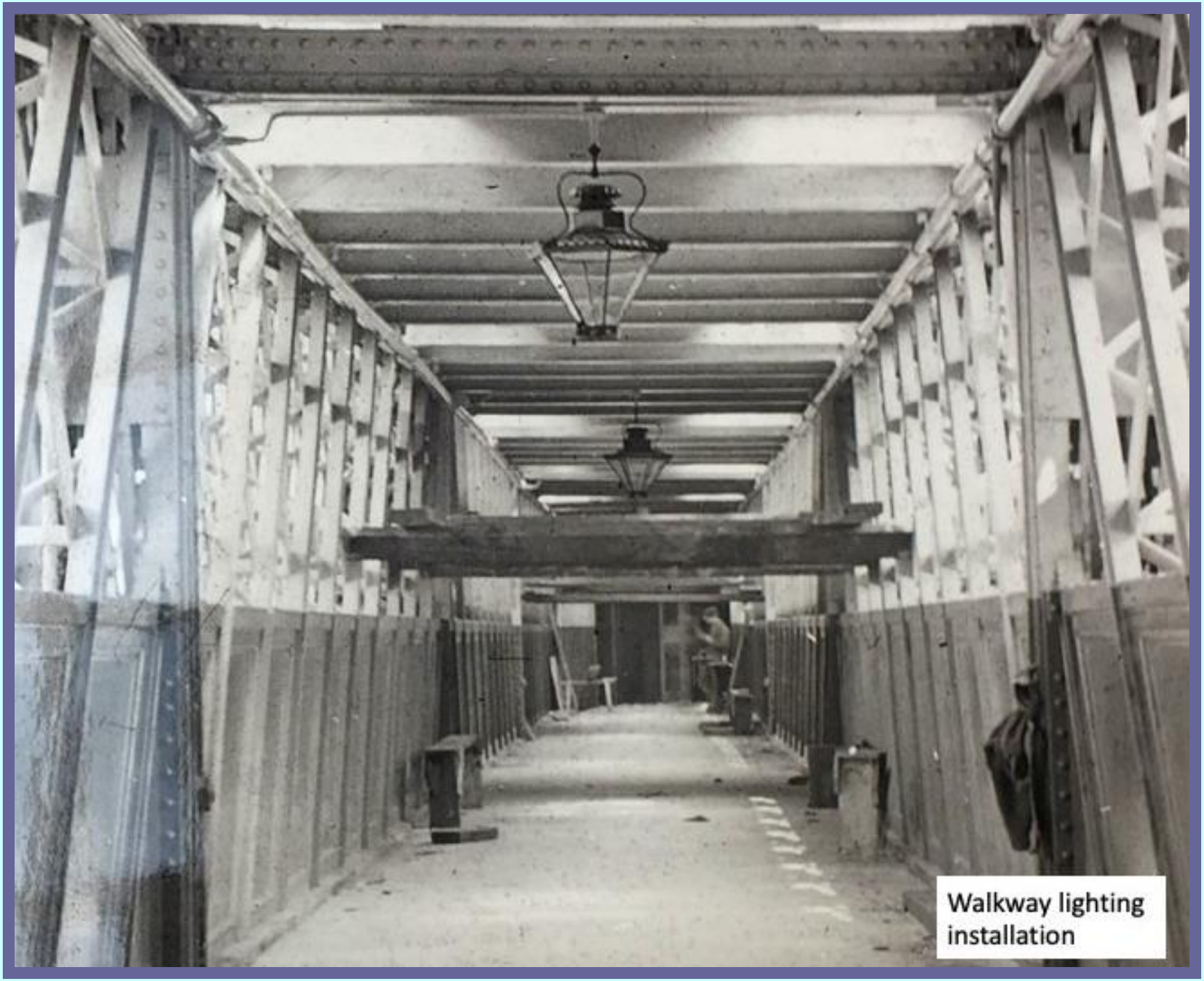

The back of this photo says that on the left is Worsfold traveller (London) & the bowler hatted man 4th from the left is Ted Nurse, Foreman Fitter.
Final stages of the William Sugg installation.

Vincent Works,
67 – 73 Regency
Street
Westminster

William Sugg with family & senior staff at the opening of the new building 1888 not long before the Tower Bridge project.


150 ton weight test
1894 caused a
deflection of only
1.5” 38 mm


Lighting already installed before heavy work completed
Probably because work was let in separate contracts



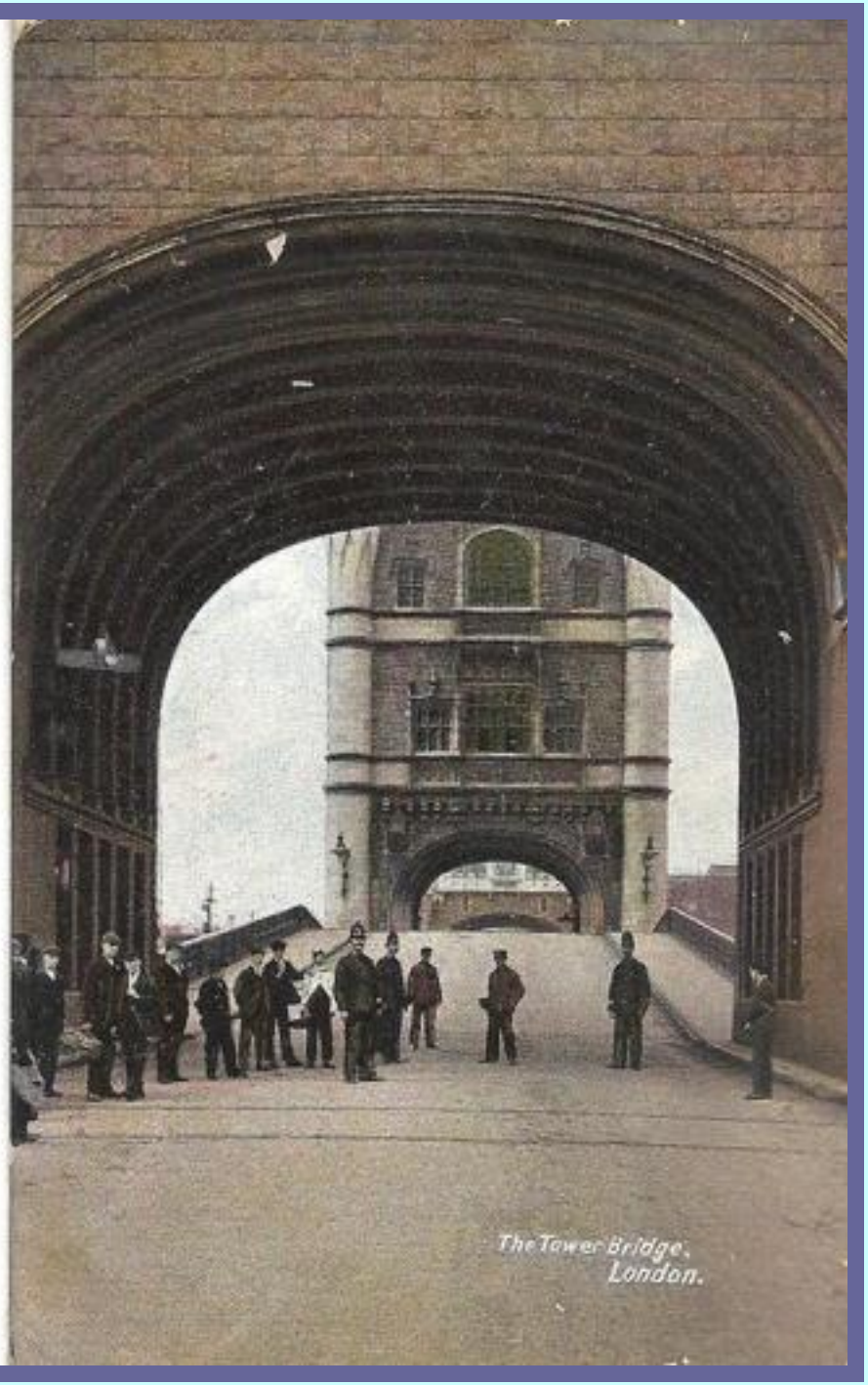
Walkway lighting installation

"The Eve of Completion: Clearing away Scaffolding"

Drawing for The Graphic's special supplement 30 June 1894

Drawing by Henri Lanos

Shortly before the opening. Workmen leaving site?



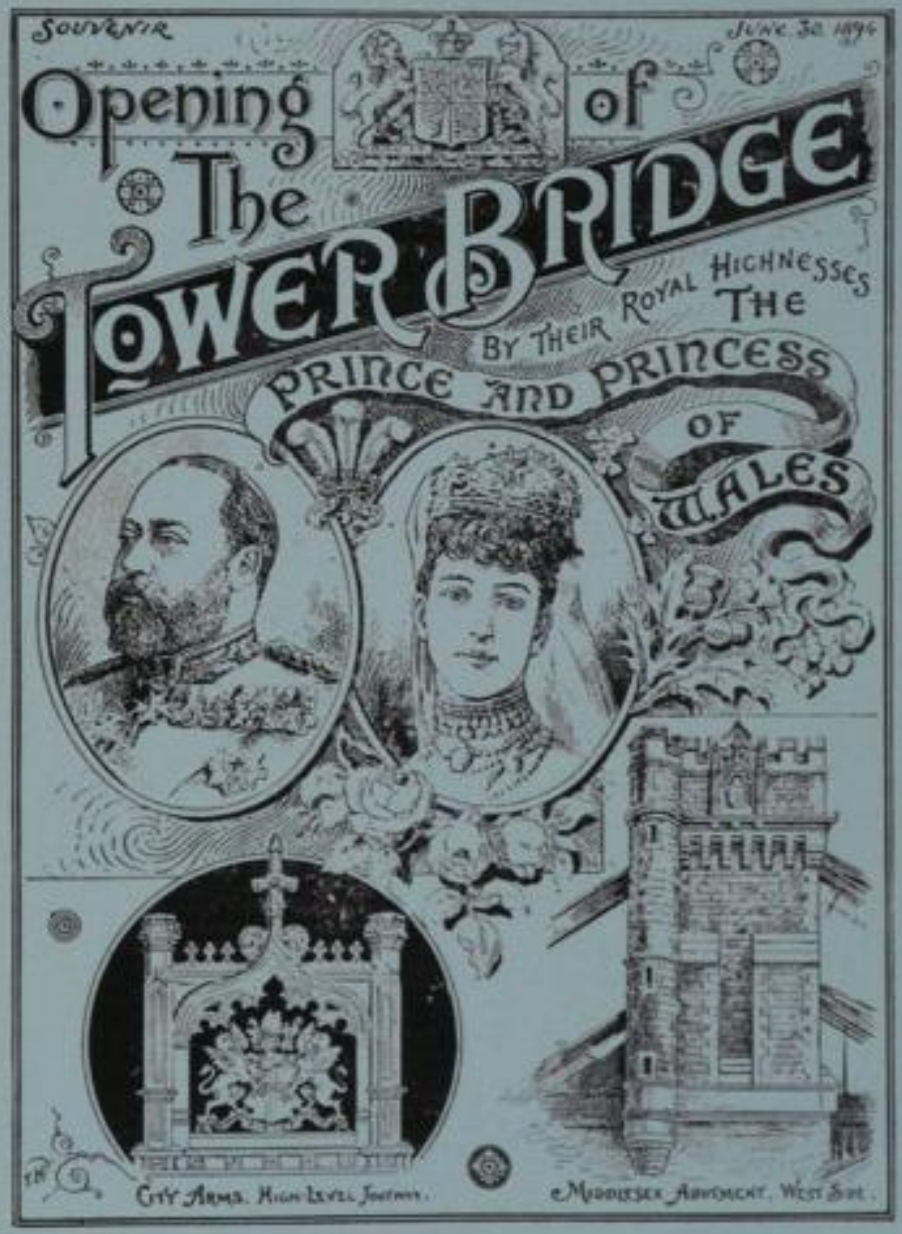
The completed bridge prior to opening.

You can just see the open flame burner in the nearest lamp

INVITATION AND OPENING DAY

OFFICIAL PROGRAMME.

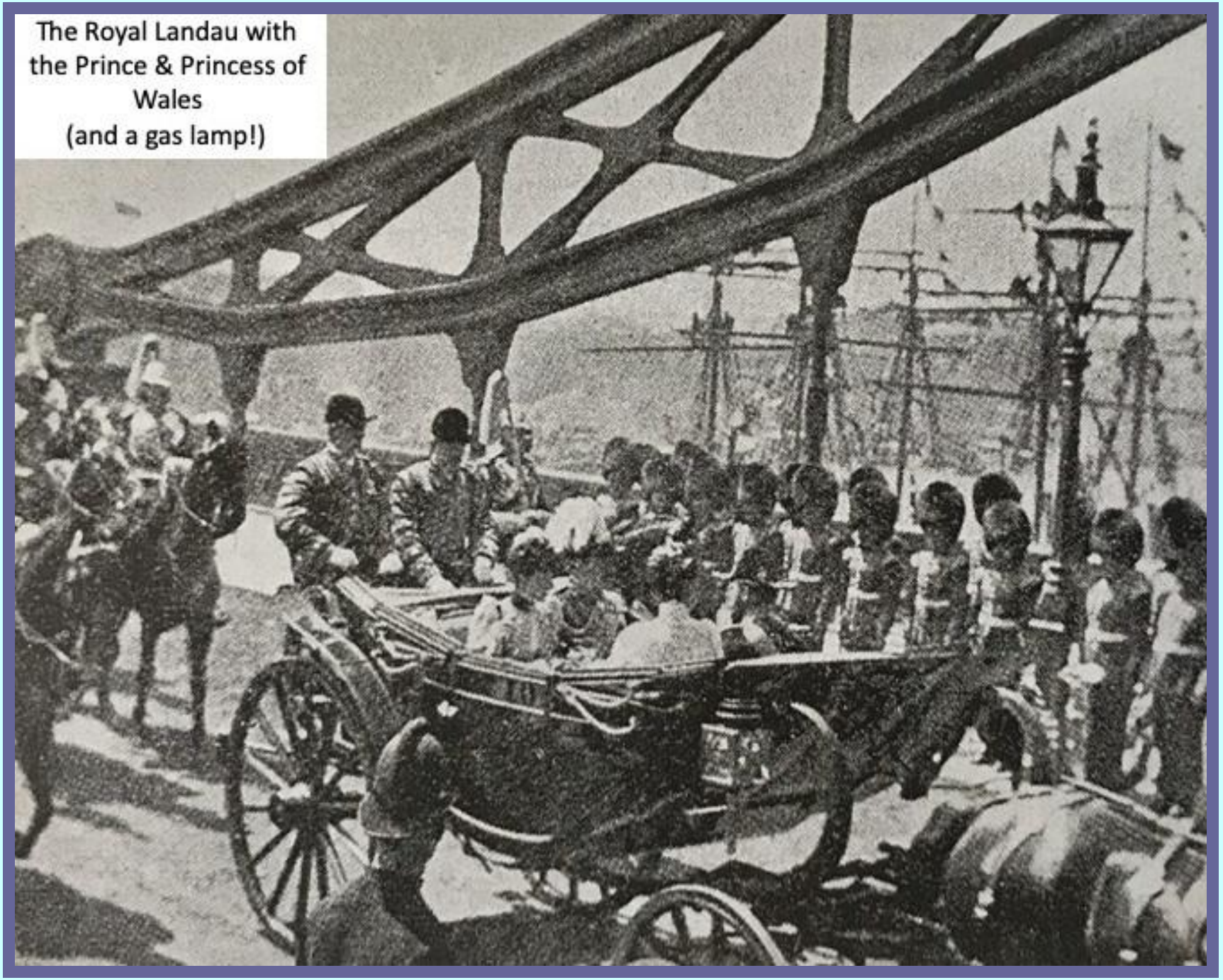
By Order of the Lord Chamberlain.



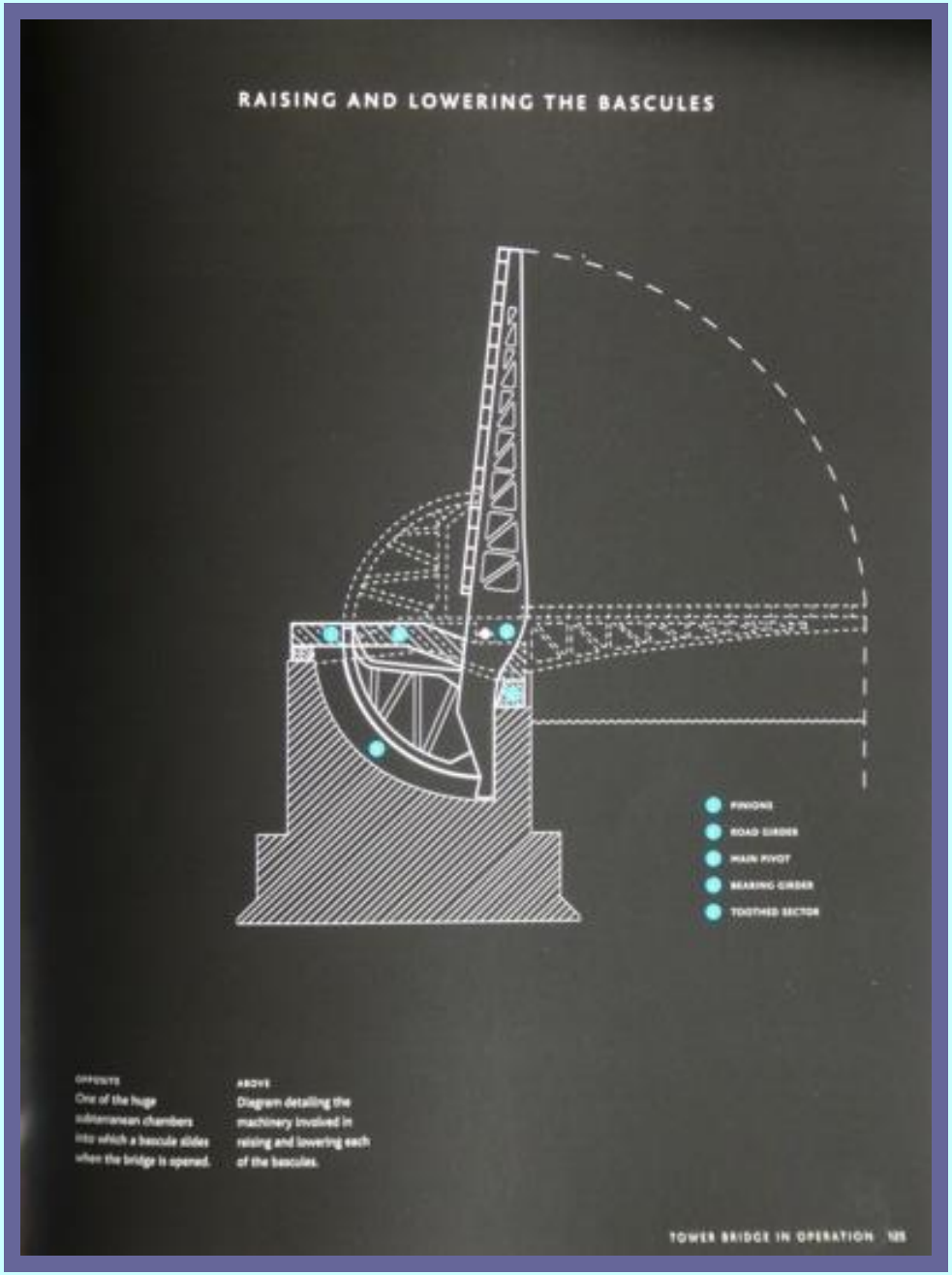
Sugg's advert published in Building News on June 29th 1894, the day before the opening.

The text says:
The Tower Bridge and its approaches are lighted entirely by gas, by means of upwards of 200 Sugg's patent high-power flat flame gas lamps. All the work supplying and running gas and water mains and supplying and fixing lamps, ornamental lamp standards and columns, hydrants, tanks and hand-pumps was carried out by William Sugg & Co


The Royal procession viewed from specially constructed stands, - doubtless for the great and the good but Suggs did receive 14 tickets! Don't miss the lamps!


The Royal Landau with
the Prince & Princess of
Wales
(and a gas lamp!)

MECHANISM AND HOW IT WORKS

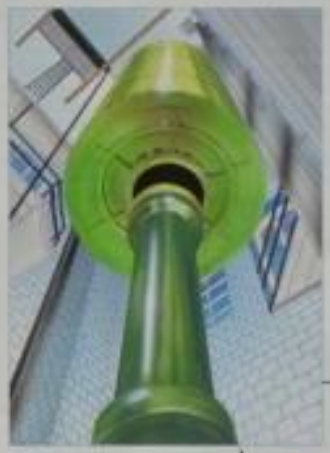



The huge space into which the counter weight swings when the bridge opens

HOW THE BRIDGE WORKS

1 *Boiler*

Four coal-fired boilers were sited on the south side of the bridge. The Lancashire boilers were each 7ft in diameter and 30ft long with double fire boxes. They provided steam at 75-80 pounds per square inch which drove the pumps supplying the hydraulic system.



3 *Accumulator*

Energy was then stored in the form of water under pressure in six hydraulic accumulators, two on the south bank of the river and two in each pier.

5 *Driving engine*

A total of eight hydraulically driven engines were installed to drive the bascules of the bridge. Each engine was a three cylinder single acting machine, and had its own integral brake. The drive was taken through reduction gearing to the shafts which drove the bascule.

4 *Control cabin*

Two control cabins were sited on each pier. These housed the controls for operating the bridge, along with the pressure gauge panel and indicators.

6 *Bascules*

It took about a minute for the bascules to be raised to their full 86°.

2 *Steam pumping engine*

Two steam-driven pumps were sited under the south approach road. These machines, produced by Armstrong Mitchell's, were of the twin tandem compound type. The pumps delivered water at a pressure of 850 pounds per square inch into the hydraulic system.

It took until 1972 for electric motors to replace steam


Cut away diagram showing
a bascule chamber and the
interior of one of the towers

The original control cabin with an interior gas lamp.

Sugg's

The "N.W."

INVERTED BURNER

A High-Grade Burner of tone and distinction

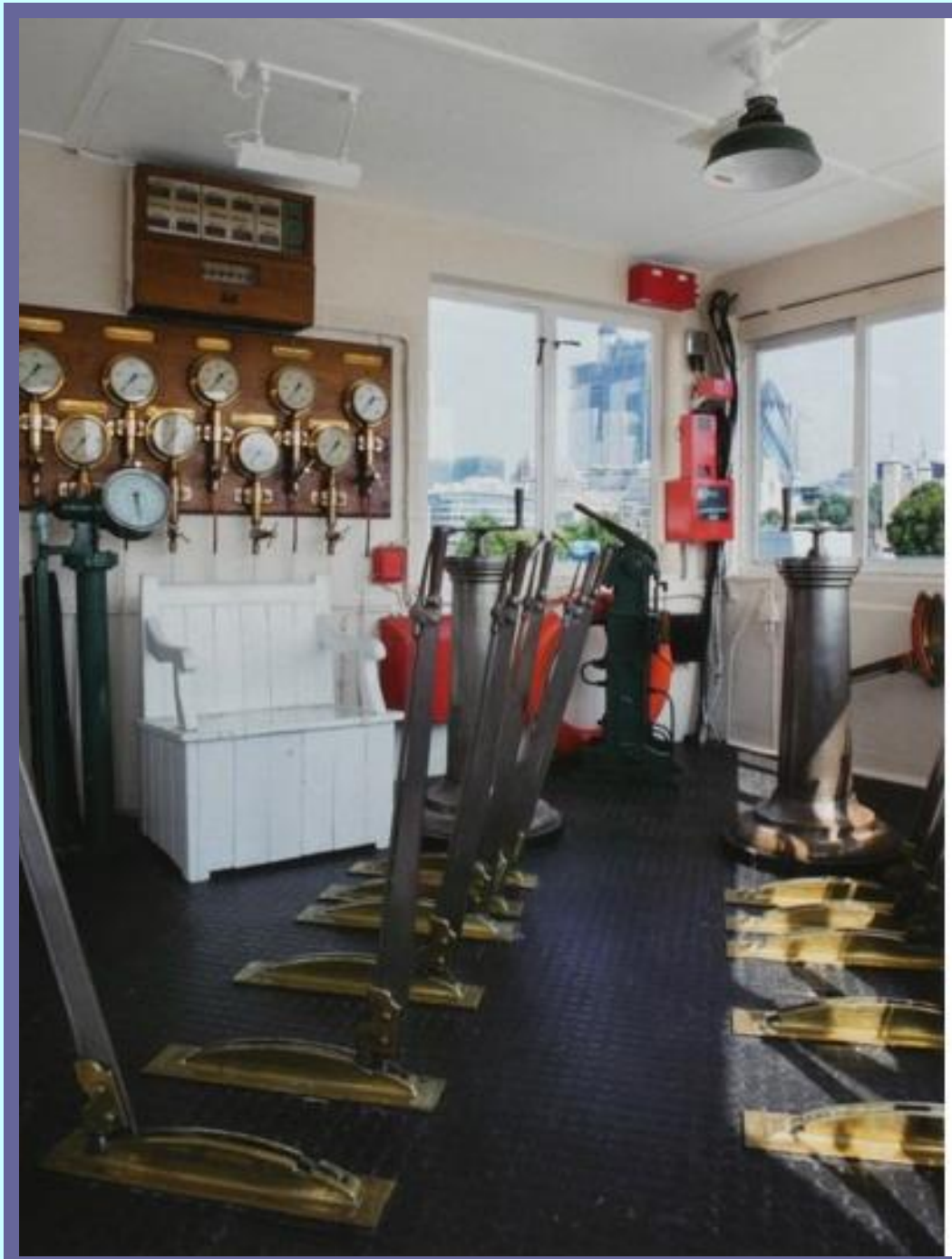
FOR

DOMESTIC USE

AND FOR

OFFICES, SHOPS, WAITING ROOMS

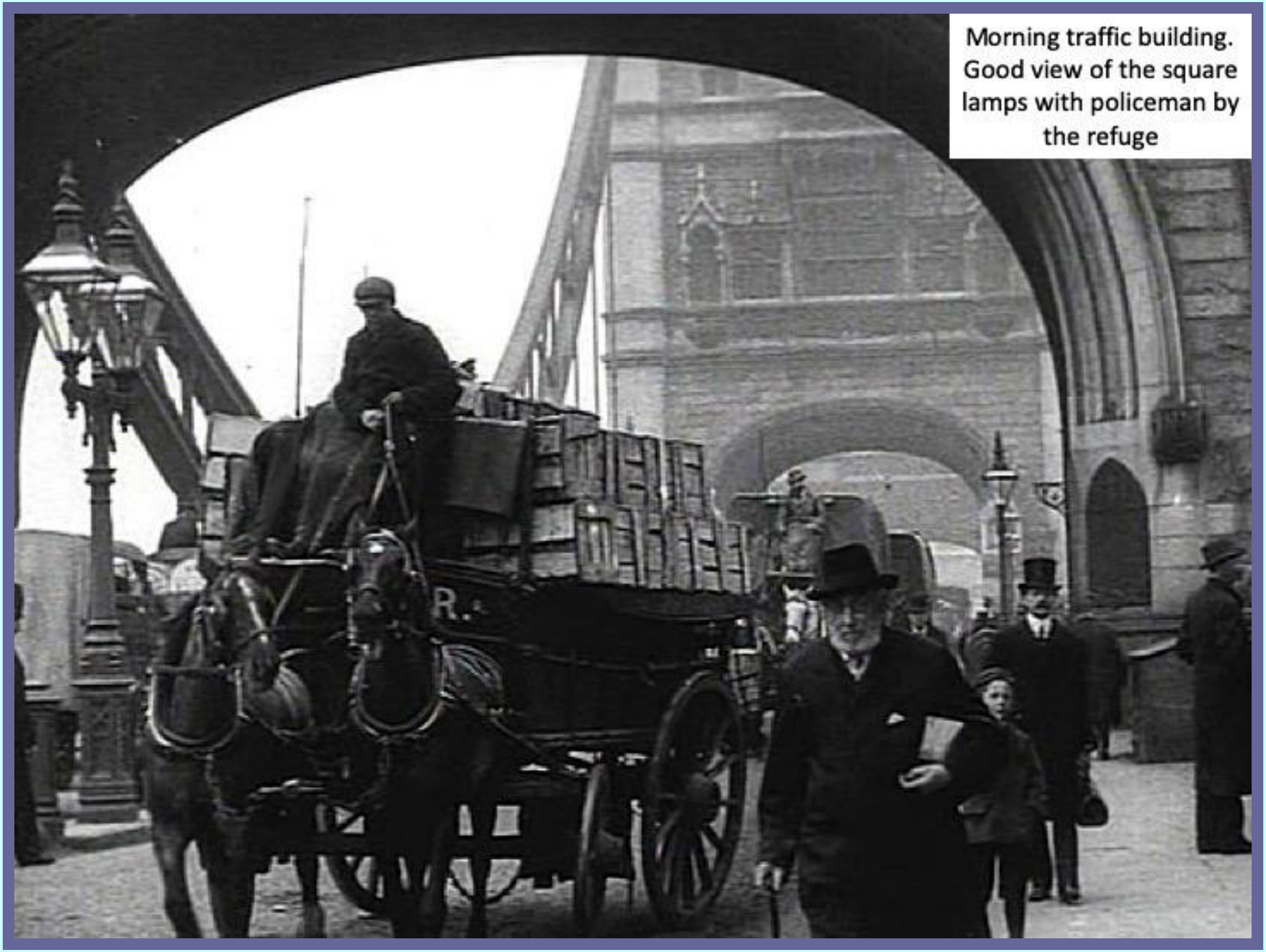
and wherever something "better than the ordinary" is required.



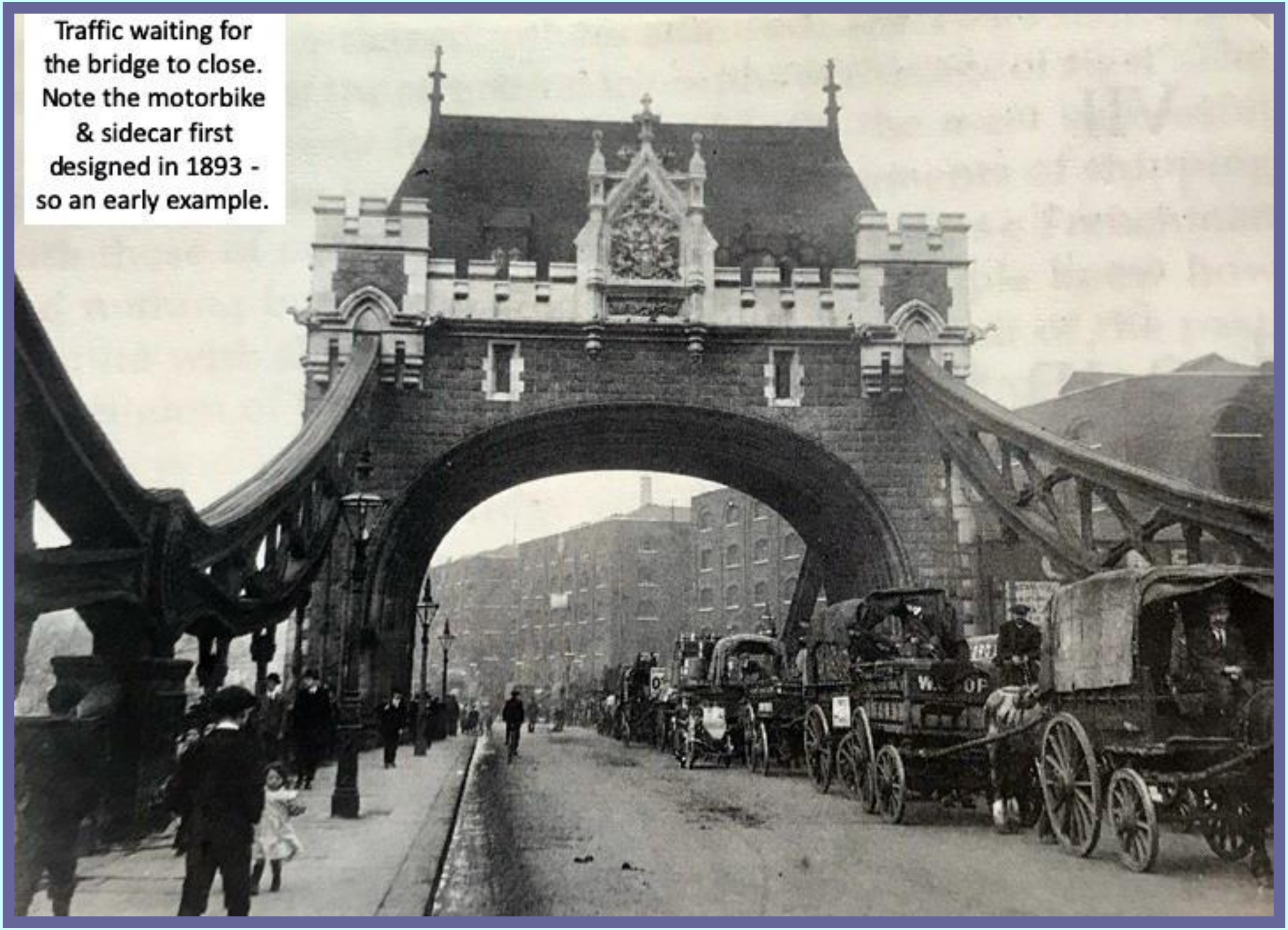
The original control cabin as preserved today – without its gas lamp!

GROWTH IN TRAFFIC

Early traffic is already having to negotiate the central refuge to overtake the slower transport



Morning traffic building. Good view of the square lamps with policeman by the refuge


Traffic waiting for
the bridge to close.
Note the motorbike
& sidecar first
designed in 1893 -
so an early example.

RETROFITTING WITH HIGH PRESSURE GAS AND UPRIGHT MANTLES AND LATER WITH INVERTED CLUSTERS

The Journal of Gas Lighting, Water Supply, etc – generally known as the JGL carried this advert on December 10th 1901

The photo is the SAME one as was used in 1894 for the original advert which shows a certain care in expenditure perhaps!

Relit with gas in 1901 just 7 years later

THE TOWER BRIDGE

Has just been Brilliantly Re-Lighted with

WILLIAM SUGG'S PATENT

High-Pressure Gas INCANDESCENT BURNERS.

Blackfriars Bridge

HAS ALSO BEEN RE-LIGHTED by the SAME SYSTEM.

EXTRACT FROM "THE TIMES," OCTOBER 22, 1901.

. . . . The Bridge [Blackfriars] itself is lighted by High-Pressure Incandescent Gas-Lamps on the Sugg system. These last, which at least hold their own in regard to illuminative effect with both the County Council's and the City of London Company's efforts in Electric Lighting, have only recently been installed, and were brought into use last night for the first time. . . . .

FULL PARTICULARS ON APPLICATION TO

WILLIAM SUGG & CO., LTD., VINCENT WORKS, WESTMINSTER.

The Times extract says 'The Bridge (Blackfriars) itself is lighted by High-Pressure lamps on the Sugg system. These last, which at least hold their own in regard to illuminative effect with both the County Council's and the City of London Company's efforts in Electric Lighting, have only recently been installed, and were brought into use last night for the first time ...

GOLD MEDALS AWARD[illegible] FOR HIGH-PRESSURE GAS BURNERS IN OPEN COMPETITION.

Fig. 1.
Burner without Anti-Vibrator.

WILLIAM SUGG'S PATENT

HIGH-PRESSURE GAS INCANDESCENT BURNERS.

For this system specially-made Burners are required. Our High-Pressure Burners are very strongly made, being cast in yellow bronze, no stamped work of any kind being used, hence the perforations for the air always remain free and open, thus ensuring at all times satisfactory working. All parts are interchangeable, and the top part of the Burner can be bodily taken off with the Mantle without breaking it whenever it is necessary to clean the Lamps or blow-out the service. Those parts of the Burner which have to do with the regulating and the burning of the gas are made in steatite, which is a natural stone unaffected by the heat or the action of the gas, and which does not deteriorate.

The Burners are made to burn 11 cubic feet of gas per hour, for which an illuminating effect of 330 candles is obtained, or 6½ cubic feet of gas per hour, giving 180 candles.

	180 Candle Power.	330 Candle Power.
Fig. 1. Burner without Anti-Vibrator, Mantle and Peg complete, as shown	s. 7 d. 6	s. 10 d. 0
Fig. 2. Do. with do. do. do. do.	10 0	13 6

Extra Mantles for 180-candle Burners 8d. each.
Do. 330 do. 1s. ,,

Fig. 3 shows WILLIAM SUGG'S PATENT HIGH-PRESSURE GAS INCANDESCENT BURNER, without Anti-Vibrator, fitted with a Gallery for carrying a Glass Vase to protect the Mantle from light draughts.

Fig. 4 shows WILLIAM SUGG'S PATENT HIGH-PRESSURE GAS INCANDESCENT BURNER, fitted with Brass Arms for carrying a Globe. This Burner is suitable for fixing to gas brackets in Hotels, Waiting Rooms, Private Houses, &c.

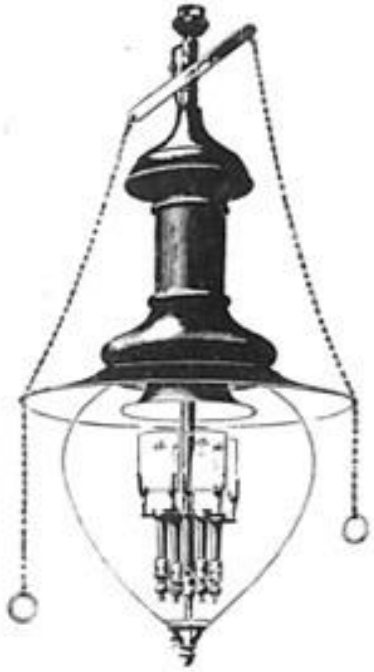
Fig. 2.
Burner with Anti-Vibrator.

William Sugg decided that he could improve on the Welsbach mantle by increasing the pressure. It was these burners that were retrofitted to several bridges including Tower Bridge.

THE GREAT REVOLUTION

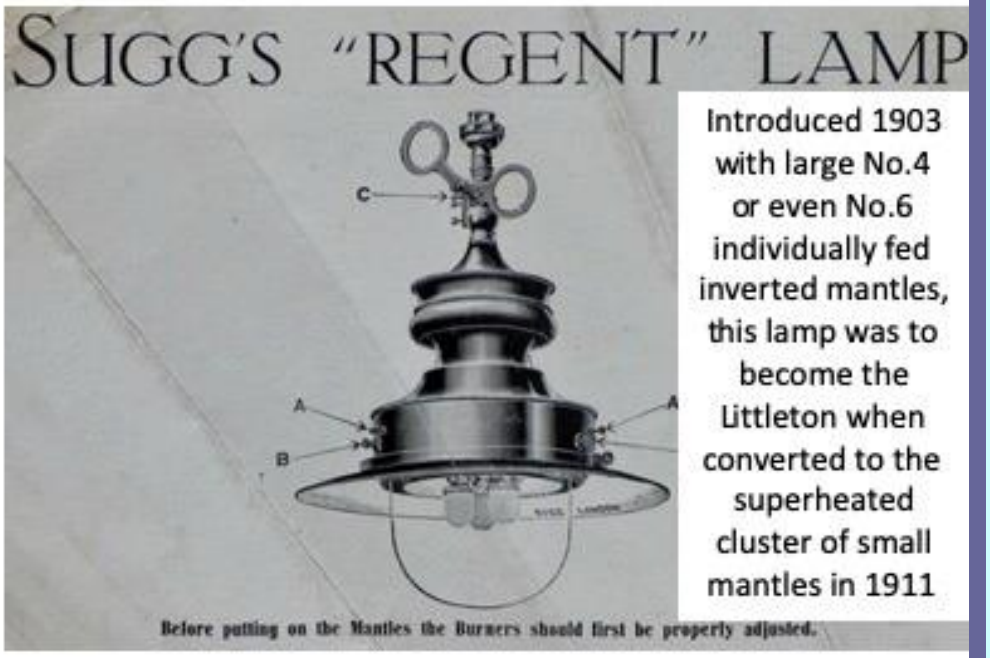
The introduction of the gas mantle by in 1887 gave 5 times the illumination of the flat flame burner. Shortly after William Sugg designed the famous Windsor lamp with an all metal roof and a full width reflector specifically for this 'revolution'.

The "WINDSOR" Lamp with Upright Burner.



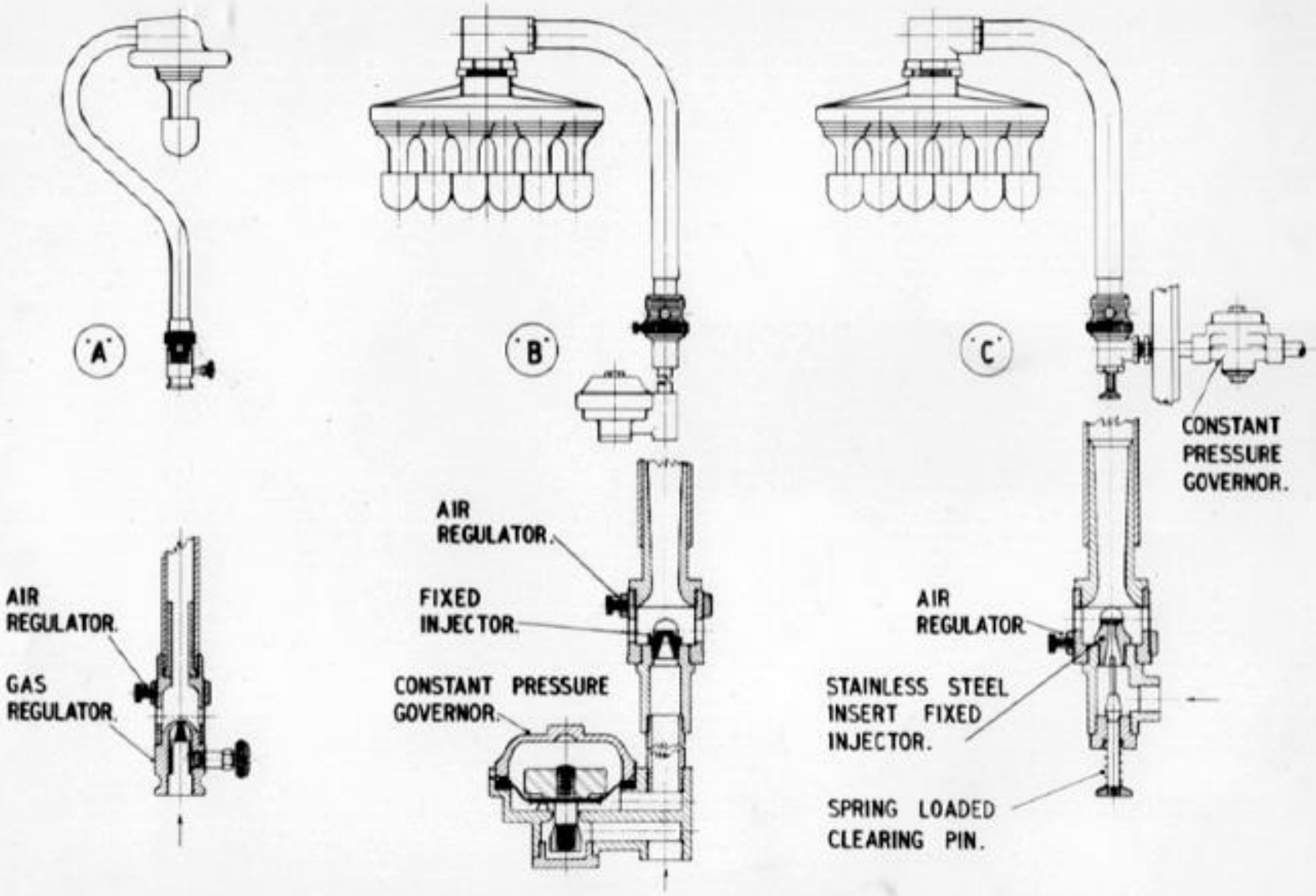
The greatly increased light given by the upright mantle allowed lamps of much smaller dimensions to be introduced and the common use of large lanterns became a thing of the past except for central positions, refuge lighting and railway yards or similar.

The "CHERTSEY" Lamp.



Introduced 1903 with large No.4 or even No.6 individually fed inverted mantles, this lamp was to become the Littleton when converted to the superheated cluster of small mantles in 1911

The great wave of converting street lamps to the Inverted superheated cluster dates from 1912



Inverted, superheated, cluster burners

Inverted mantle burner

Passing the time of day. On average it took 6 minutes for the bridge to open and close.

One of the reasons why pedestrians gave up using the high level walkway.

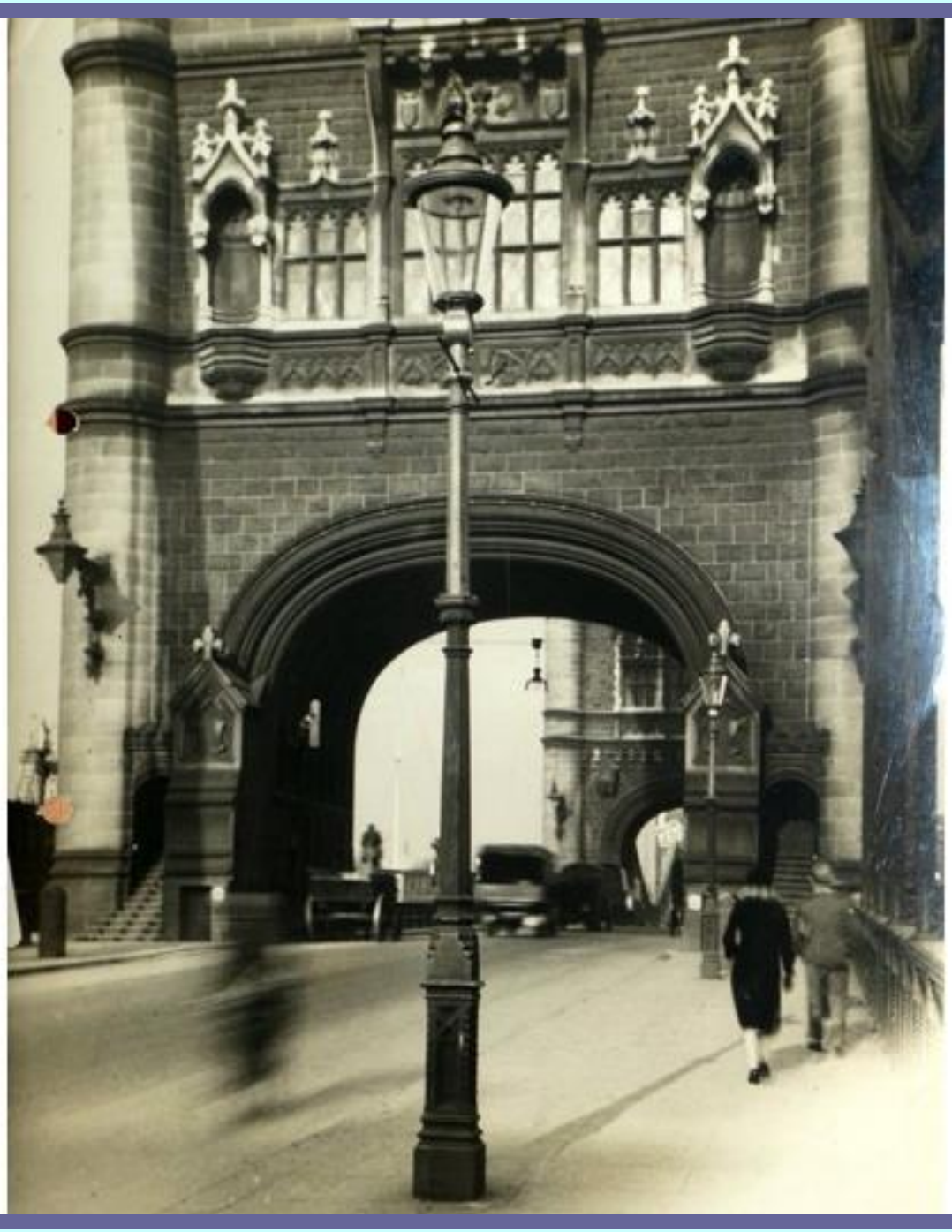
A Keith & Blackman High Pressure gas lamp.

Lighting innovation. Circled are gas floodlights for the bascule roadway.

Also a centrally suspended Rochester lamp with traversing & lowering gear.

1930's

Opposite side of the same tower with the floodlights shows an original post that has been extended by at least half again carrying one of the new lamps with a superheated cluster burner



Judging by the dirty glass the old lamps look as if they are no longer in use

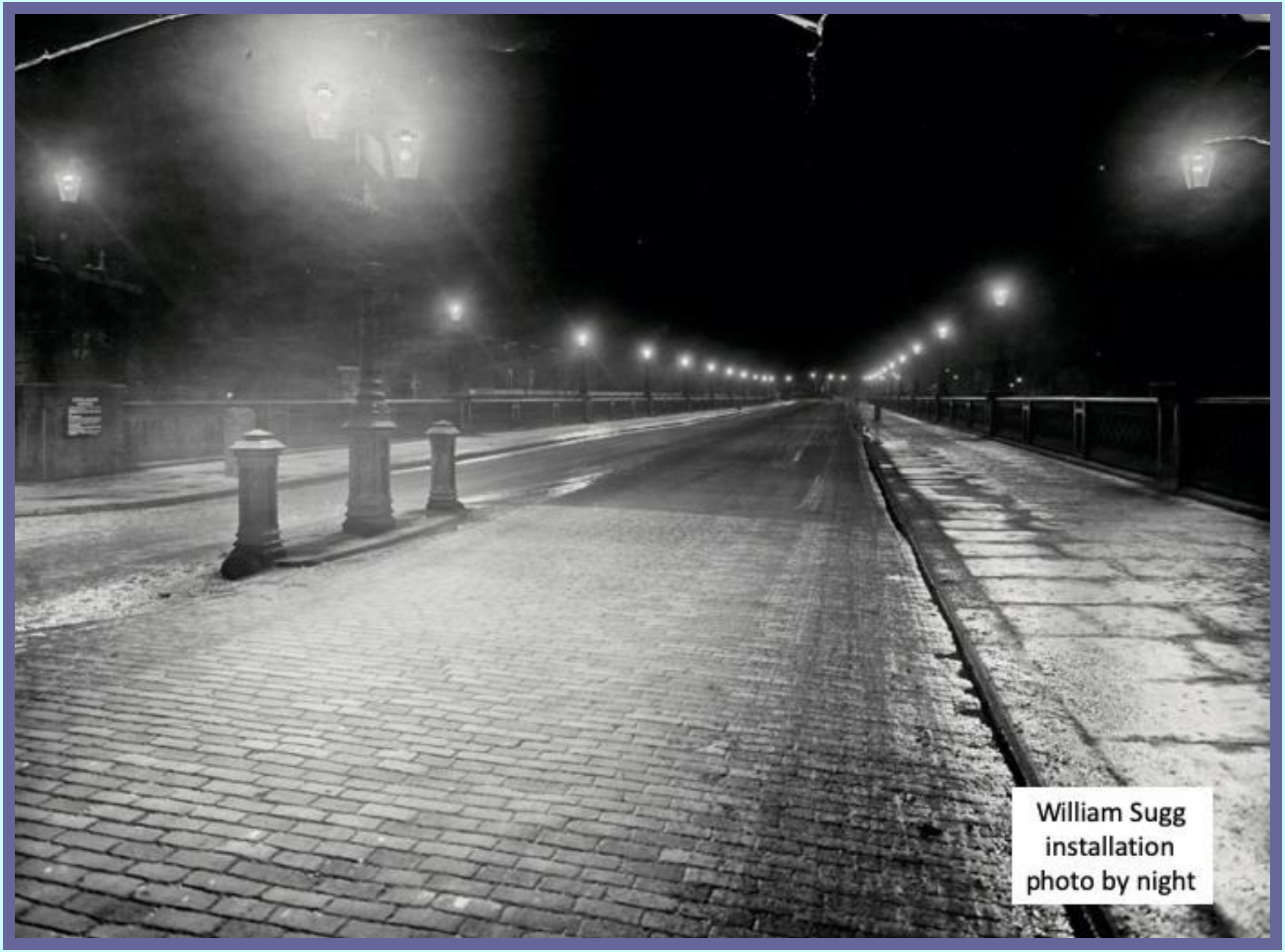
1930's

Taken from the same side but a little later, the large lamps have been removed, witness the 3 new pieces of clean stone that remained until the whole bridge was cleaned in 1976 by Stoneguard Projects

1930's with inverted cluster burners

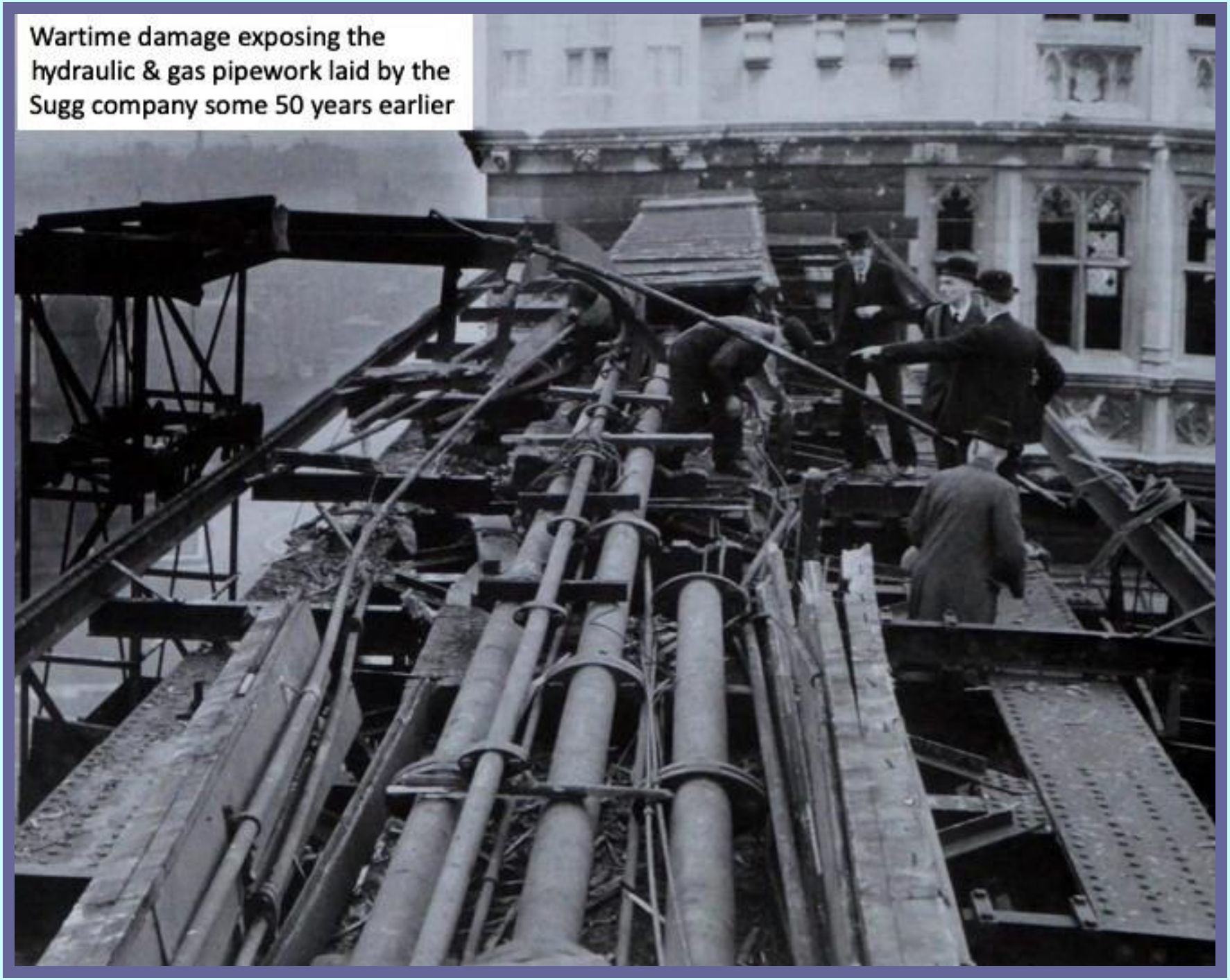
2013 with electric lamps


William Sugg
installation
photo by day.
WAREHOUSES
TRAVERS & SONS L


William Sugg
installation
photo by night

1930's with inverted cluster burners

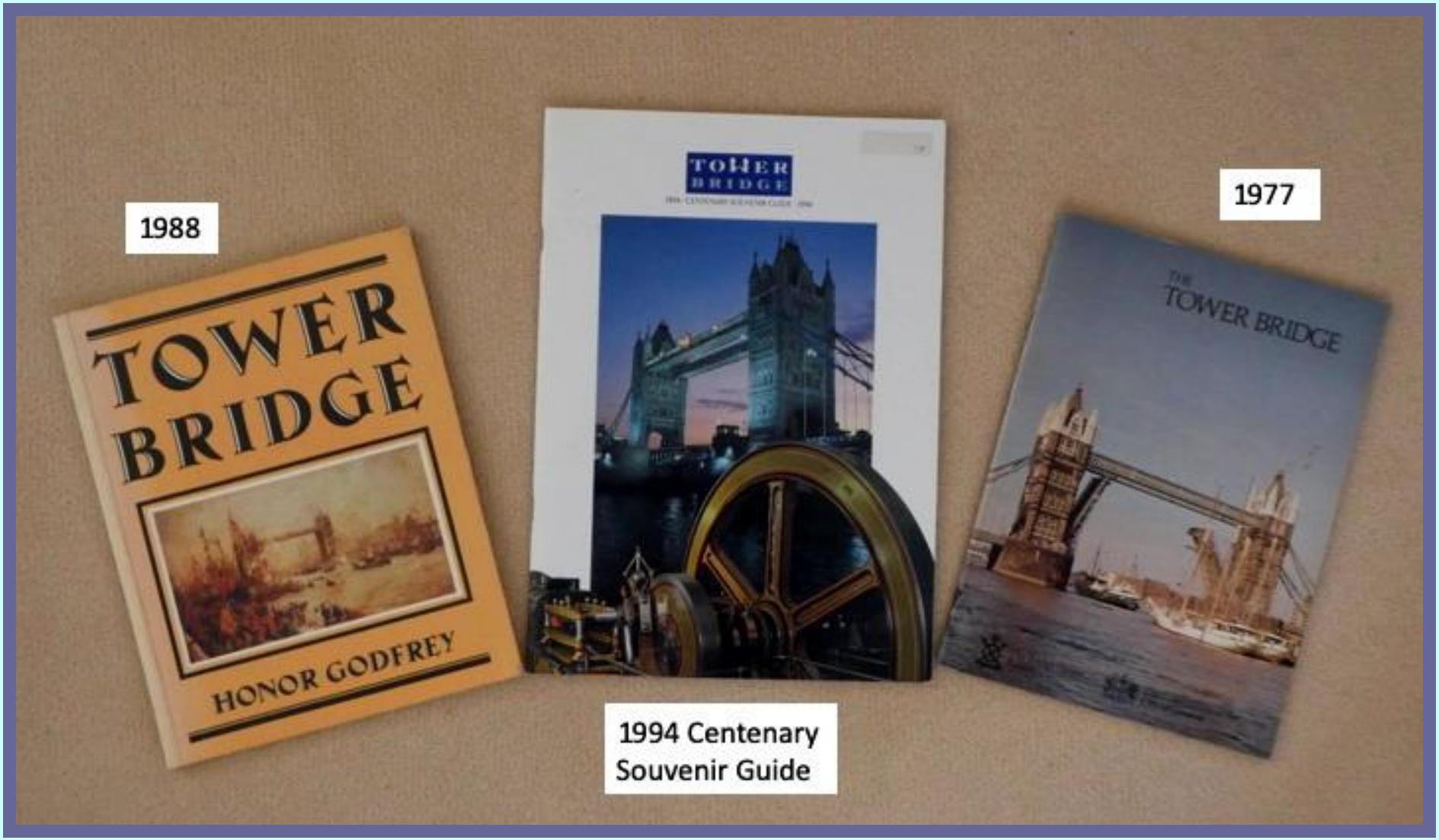
2013 with electric lamps


Wartime damage exposing the
hydraulic & gas pipework laid by the
Sugg company some 50 years earlier

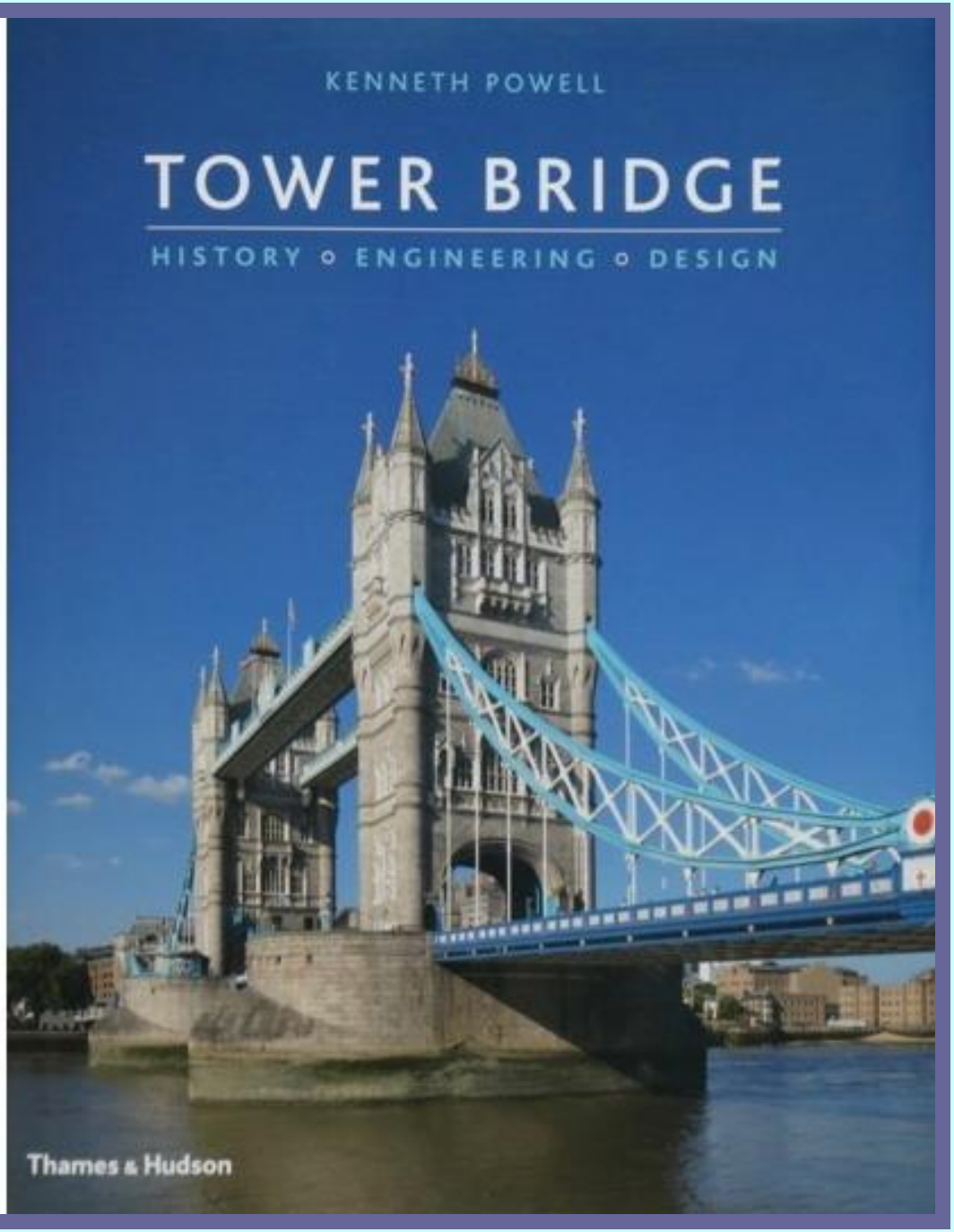
Charles Ford, one of the last of Tower Bridge's Lamplighters, lighting a Sugg Windsor Lamp in a photo from 1949.

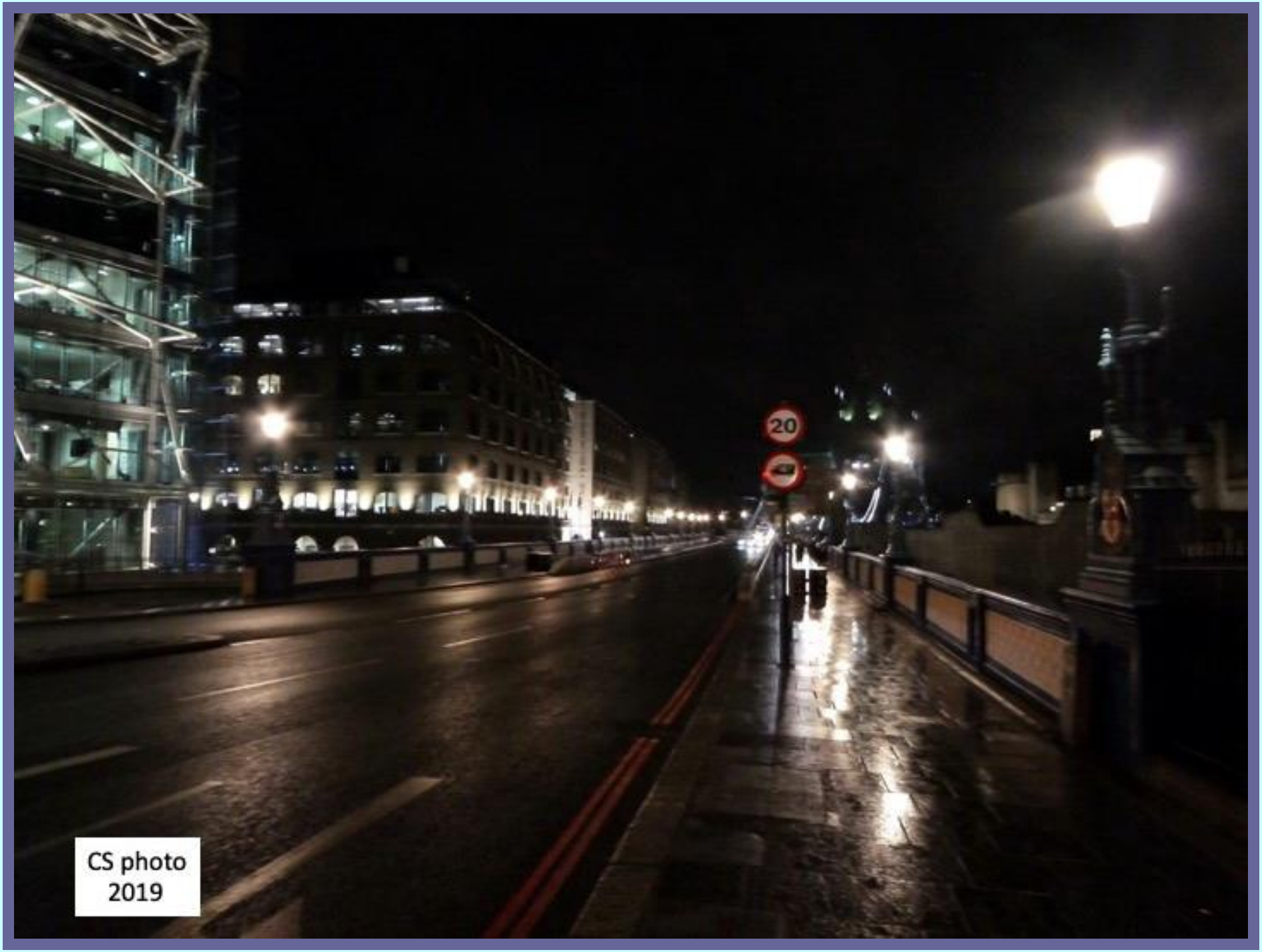
The gas lamps were not finally replaced until 1966

REFERENCES, RECENT PICTURES AND TOWER BRIDGE MUSEUM

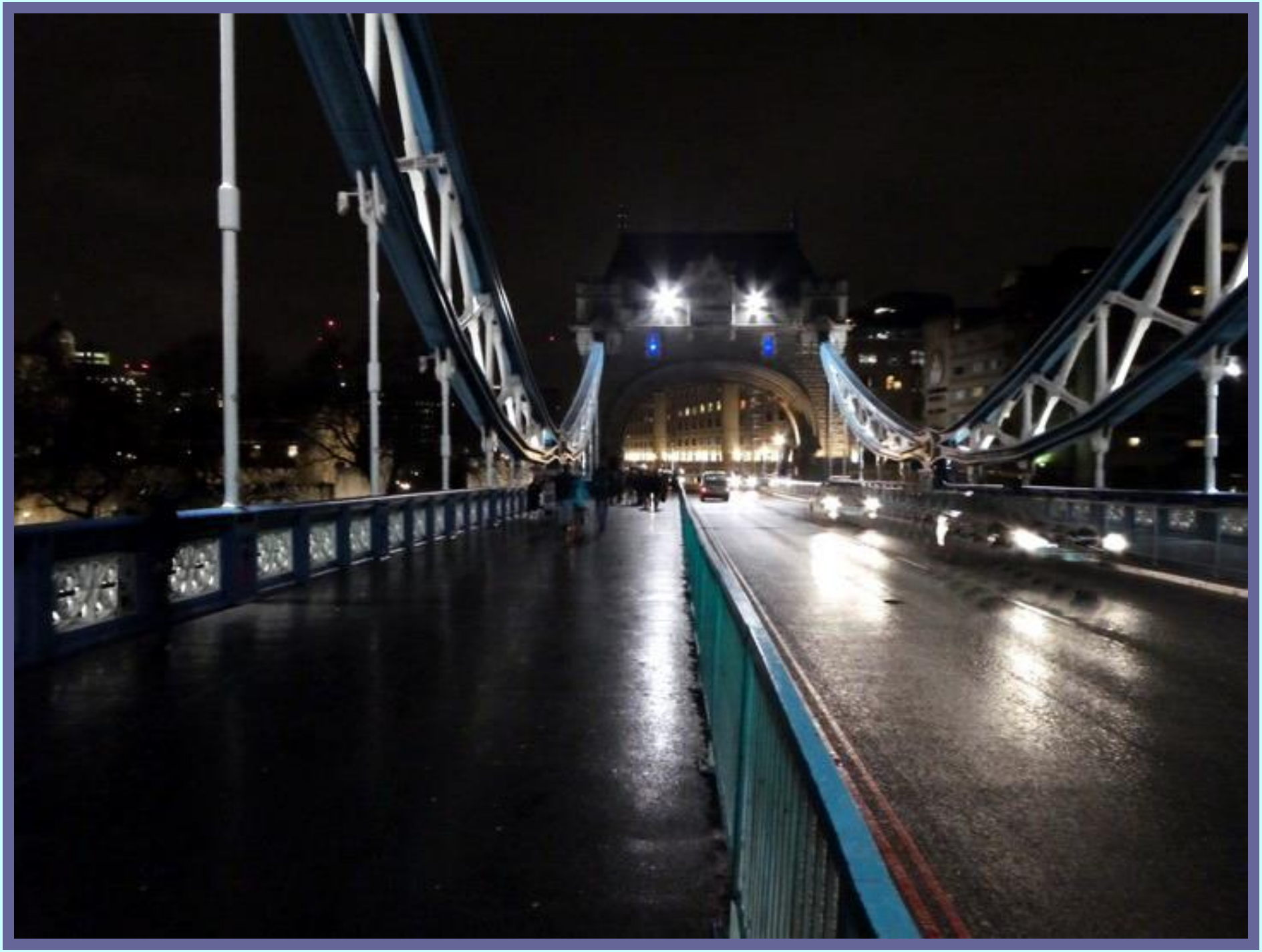


New book for the 125th anniversary 1894-2019

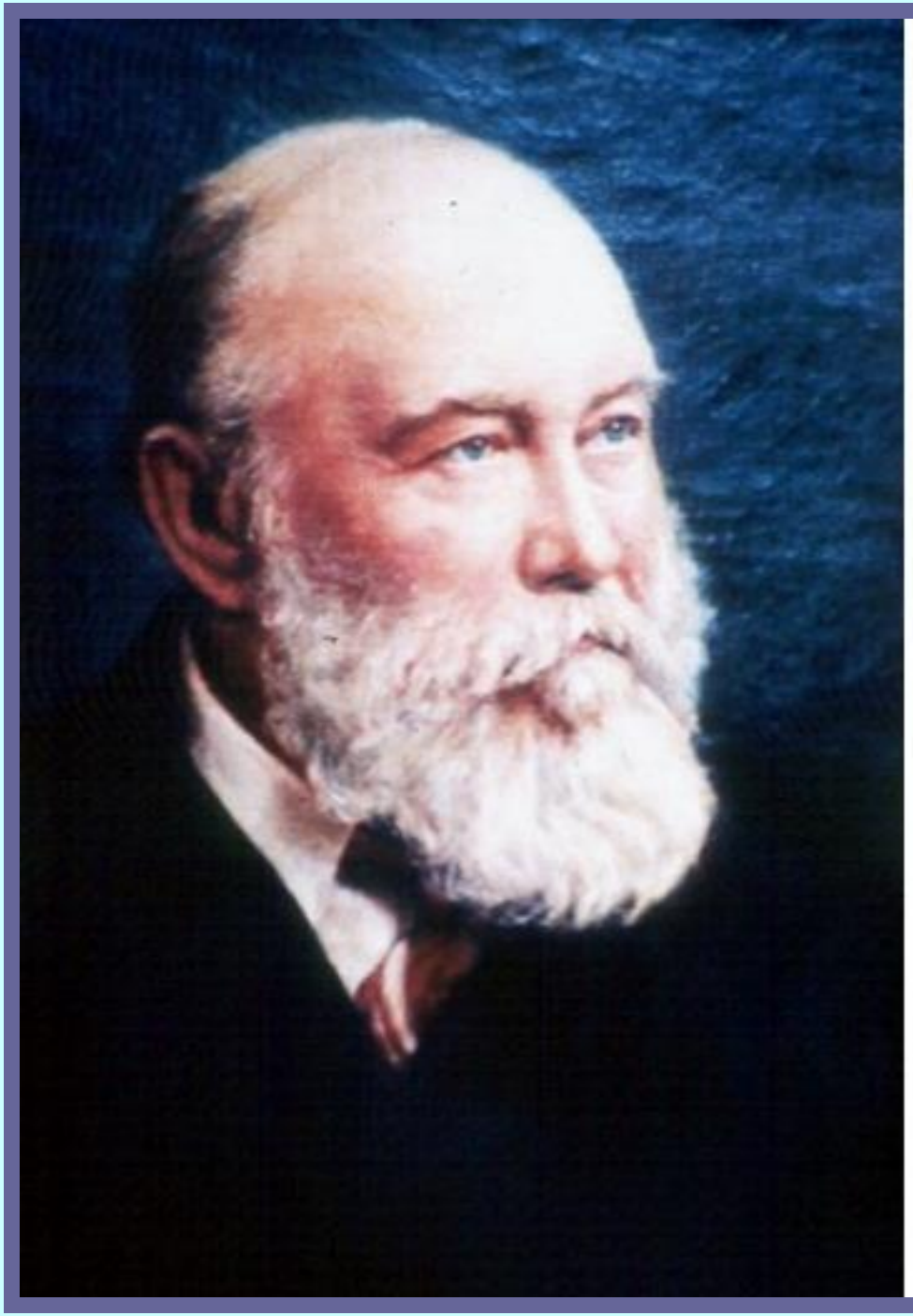



20
CS photo
2019


PEANUTS
& ALMONDS



These pictures were all taken in 2019 and show that William Sugg's lanterns, then 125 years old, can still be viewed in their original location in the north & south towers of Tower Bridge



William Thomas Sugg
1832 – 1907
Managing Director,
1881 - 1907