CIBSE HERITAGE GROUP

PUBLICATIONS WITH INFORMATION ON TRANSPORT: SHIPS, RAILWAYS, AIRCRAFT & PEOPLE MOVING
Including boilers, steam and electric power, air conditioning, refrigeration, elevators, escalators & moving pavements, transport buildings & tunnels

Ocean Steamers
A History of Ocean-going Passenger Steamships 1820-1970
John Adams

1993
1987 the ship, launched in 1858, was fitted with both paddle-wheel and screw propulsion.
ANATOMY OF THE TITANIC

1996 detailed information/photos on boilers, flues/funnels, fans & pumps, steam engines, electric plant & switch boards, and refrigeration
TITANIC

Peter Thresh

1992
1985 a record of the lighting in Public Rooms
1995 gives photos/details engines, boilers, flues & pumps
Had 30,000 electric lamps
Robert Wall

OCEAN LINERS

1977
1992 shows public rooms and cabins
Travelling through time

In a bumper Christmas issue of Golden Oldies, Brian Roberts delves into the CIBSE heritage files and asks “How did Lindbergh spend a penny while on the first solo Atlantic crossing?”

How did the Viking warriors keep warm on their longships in icy Northern waters? What was the lighting system on the first Orient Express?

No, I don’t know the answers, and like most building services engineers I know very little about the heating, plumbing, air conditioning and lighting of things other than buildings.

Consequently, one topic being investigated by the CIBSE Heritage Group is the history of these services in transportation. What follows is just a few revelations.

Railway passenger carriages

Richard Trevithick’s Pelyntorren Tramroad, from Metherthyr Y Felinfach to Abersychan, opened in February 1804. A painting of the event depicts Trevithick, spanner in hand, marching briskly alongside, just in case running repairs were called for. The picture also shows the first passengers, uncomfortably but enthusiastically crammed into open wagons, braving both the elements and the smoke and cinders belching from the locomotive chimneys.

Early passenger carriages were flanged-wheel adaptations of the stagecoach, often four or more coaches combined on a single railway frame to provide compartments with side doors.

By 1830 first class travel became more comfortable, particularly on the broad gauge Great Western Railway, GWR.

“...whose standard first class compartments could seat eight assured stout men and for women — John and Joan Hall — with room to spare on the best hair-stuffed Morocco leather.

But there was no water heating for them; no applied sanitation, while the vegetable oil lamps dropped through holes in the roof at night were of the dimmest sorts.

In America, the conveyance of passengers across vast distances demanded something superior and carriages were based on the design of the canal boats which had preceded them. Europe stuck to stagecoach ideas, with increasing variations. The first worthwhile improvements came in America. The long open coach called a “shabby omnibus” by Charles Dickens and termed an “elengated spittoon” by someone less charitable, became gradually refined.

Building Services December 1986
1997 architecture of railway stations & termini
The American Heritage History of Railroads in America

1975
Travelling in Comfort

by

NEVILLE S. BILLINGTON, O.B.E., M.Sc., F.C.I.B.S.

Read at the Science Museum, London, on 13 November 1985

G. Kichenside, writing in 150 Years of Railway Carriages, states:26

Railway history is bound up with social history, by reflecting changing trends—carriage provision being forced on unwilling managers by public opinion or by legislation. It took nearly 70 years for railways to accept that passengers on long-distance journeys might need to use a lavatory, eat or even feel warm. Many railways resisted such developments because the provision of toilets, dining cars, of heating and of good lighting all added to the weight of the train.

HEATING OF TRAINS

In Locomotive Railway Carriage and Wagon Review one reads:6

Although the desirability of heating railway carriages was recognised from the beginning, it was long before any effective system was devised; indeed it may be said that a thoroughly efficient method is a comparatively recent development. For many years, heating was commonly performed by means of portable containers filled with hot water, which were pushed, with much clatter and disturbance, into the carriage and were supposed to impart some warmth to its interior, but more especially to the feet of the semi-frozen passenger. As a means of producing chilblains, it would be impossible to improve on this primitive contrivance, but as it lacked every desirable feature, and was besides most troublesome and uneconomical, requiring quite elaborate plant for charging, heating, handling and maintenance, it gradually gave way on progressive railways to more scientific and satisfactory arrangements.

It is remarkable that the use of steam from the locomotive, though this might be supposed to be the obvious solution of the problem and was in fact tentatively used in Germany as far back as 1865, was neglected in favour of stoves, either alone or in conjunction with hot air circulation or thermo-syphonic water apparatus in bewildering variety. The most complete account of such systems, to the writer’s knowledge, is to be found in Moreau’s monumental ‘Traité des chemins de fer’, vol. IV, Sec. 590-713 (written about 1897).

The hot-water tin was introduced to Britain by the Great Northern Railway in 1852, though it had been used previously in France and North America. The tins were hired by passengers and placed in a floor recess. Findlay, describing the working of the LNWR,19 states:

...from November 1 to March 31, every compartment (of all classes) was provided with at least two footwarmers. The ordinary warmer is an oblong tin filled with water and sealed: it is then placed in a boiler until the water is hot. The present soda-acetate warmer is now (1899) in use on all main lines of the LNWR—a comparatively recent introduction. The heat is retained nearly three times as long as the water tin, viz., about 8 hours. The heaters are charged thus—7 quarts of liquid soda-acetate are placed in each, 7 oz of water added, and 2 cast-iron balls 2 in. dia. and weighing 20 oz are placed inside. The entire heater is warmed to boiling point and then sealed.

Ellis7 says the soda-acetate warmer was introduced by the LNWR in Webb’s time and it was later adopted by other railways. The foot-warmer went out of general use about 1901 though it was still available until c1914 and later on slip coaches owing to the difficulty of arranging steam hose-couplings for these. A Midland Railway working timetable of June 1911 gives detailed instruction as to the supply and distribution of foot-warmers to the public. Similar soda-acetate heaters were brought into use in Australia in 1891 and not finally phased out until 1976. They may still be found on certain sections of South African Railways.

Fuel-burning stoves do not seem to have been used in passenger vehicles in Britain, though they were employed in Europe at least until the end of the 19th century. In Britain, however, stoves were regularly used in guard’s brake vans where there were no passenger seats; they remained in use well into BR days.15 Gautier (Voyage en Russie, 1873) commented that the foot-warmer would soon freeze
1984 Includes steam engines & machinery, application to transport and electricity generation
1992 history of Brunel’s tunnel under the Thames (Rotherhithe to Wapping). Now used by trains. Has been visited by the CIBSE Heritage Group.
THE GREAT WORKS OF MANKIND

A VISUAL HISTORY

by Jacques Boudet
Claude Manceron and Jacques Ostier

UNDER THE GENERAL EDITORSHIP OF
Robert Laffont

TRANSLATED BY
Anne Carter

THE BODLEY HEAD
LONDON

From the French 1961 with drawings of tunnels through the Alps
THE AIR AND VENTILATION OF SUBWAYS

BY
GEORGE A. SOPER, Ph.D.
MEMBER AMERICAN SOCIETY OF CIVIL ENGINEERS,
AMERICAN CHEMICAL SOCIETY, SOCIETY OF
AMERICAN BACTERIOLOGISTS, AMERICAN
PUBLIC HEALTH ASSOCIATION

FIRST EDITION
FIRST THOUSAND

NEW YORK
JOHN WILEY & SONS
LONDON: CHAPMAN & HALL, LIMITED
1908
1992 (National Geographic): aqueducts, water supply & tunnels
1982 includes early airports & Mersey Tunnel
Airports
A Century of Architecture
Hugh Pearman

2004
1956 includes aircraft refrigeration systems
OTIS

Jason Goodwin

Giving Rise to the Modern City

2001 elevators & escalators
1973 from the Dutch: includes elevators, escalators & moving pavements
DESCRIPTION OF THE LIFTS IN THE EIFFEL TOWER.

By Mr. A. ANSALONI, of Paris.

The Eiffel Tower, Fig. 1, Plate 61, though 384 feet high, would be of comparatively little interest if seen only at a distance. The details of this gigantic structure call for close examination; and from its successive platforms, as they rise one above another, a widening prospect is enjoyed, which at the summit extends to a distance of forty or fifty miles round.

In the erection of this work, the designer has also had in view the means of rendering it accessible to the greatest number. To climb 1,800 steps on foot to the summit was not to be thought of, though a staircase may suffice for mounting to the first platform, 189 feet above the ground. This platform can accordingly be reached without fatigue by two wide staircases, constructed in the east and west piers. Even the second platform may also be reached by small winding staircases which occupy the four corners of the tower.

Independently of the staircases however, the ascent is made by means of Lifts arranged in the following manner. Two lifts on the Roux, Combaluzier, and Lepape system, with chains of jointed rods, lift from the ground to the first platform, working alongside the staircases in the east and west piers. Two American lifts on the Otis plan work in the north and south piers, starting likewise from the ground and rising to the second platform at 380 feet height, with option of stopping at the first platform. Lastly, by a lift on the Edoux system, placed vertically in the centre of the tower, visitors are raised from the second platform to the third at a height of 906 feet above the ground.

Each Roux lift is capable of raising 100 persons at a speed of 197 feet per minute, and will make twelve trips per hour; the two

1889 detailed drawings of Eiffel Tower Lifts
1977 shows travelling gantries for moving people