

Expansive Engineering ~1800 - 1940

1851: Great Exhibition

Achievements: Steam railroad public 1825 near London
dynamite (chemistry)

bicycle

automobile

lighting (elec.)

rubber

station

bridges

Consequences: rails broke,
explosions

right of way.

tunnels

Expansive Eng. 1800-1940

1851 Great Exhibition London

Transport: Steam railway
steam ships
airplane
Hindenburg.

Mech/
Civil

bicycle	piston → turbine
automobile	pipelines
bridges	dams
tunnels	canals

Chem. dynamite
rubber
pesticides
fertilizers (am)
petroleum

Elec: lighting
communication - wire(less)
(1837) telegraph
1865 Maxwell
1901/1901, Marconi transatlantic
TV (1939)

Metallurgy: better Steels
Bessemer furnace

Social: right of ways
political
social class
equalization

Eng. associations.
1828 Institution of Civil Engineers

by 1900 many.

Eng. education
1850-1900

Environment: pollution
not recognized, but beginning

Very extensive industrialization

Electrification

Heavy industry (Steel)

Automotive

new technical artifacts

Environmental Impact of Devices

increased need → calls for improvements in steel making.

leads to → more supply

↑
leads to

greater use
incl. new appl.

← enables