



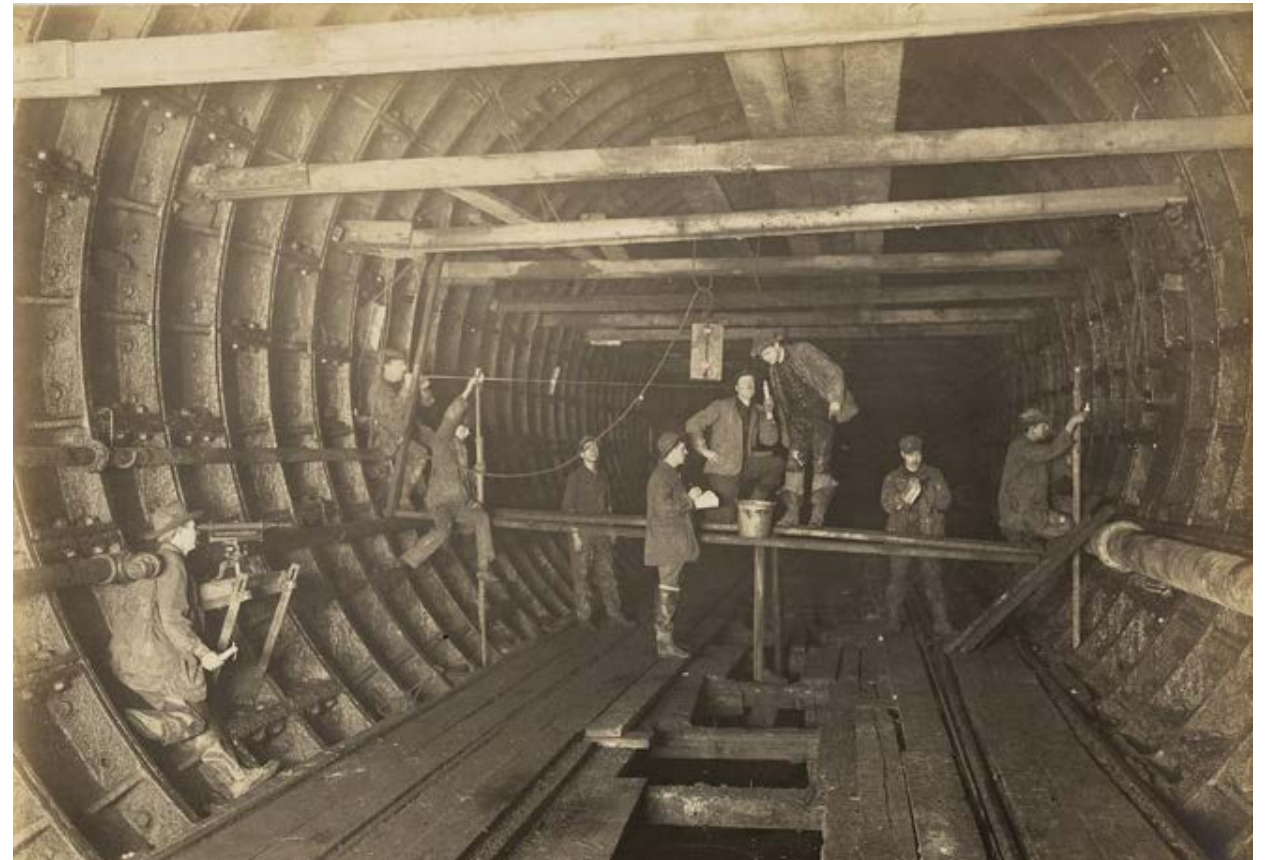
CONQUERING GOTHAM

A GILDED AGE EPIC:
THE CONSTRUCTION OF PENN STATION AND ITS TUNNELS

JILL JONNES

The Travails of the Tunnels Historical Perspective on the Trans-Hudson Challenge

By Jill Jonnes, Author *“Conquering Gotham: The Construction of Penn Station and its Tunnels”*



1910 in America

- Average hourly wage – 22 cents
- Cost of Model T – 400 dollars
- Silent movie ticket – 7 cents
- Only connection between New York and New Jersey is by ferry







Pennsylvania Railroad Access to Manhattan: How to cross?

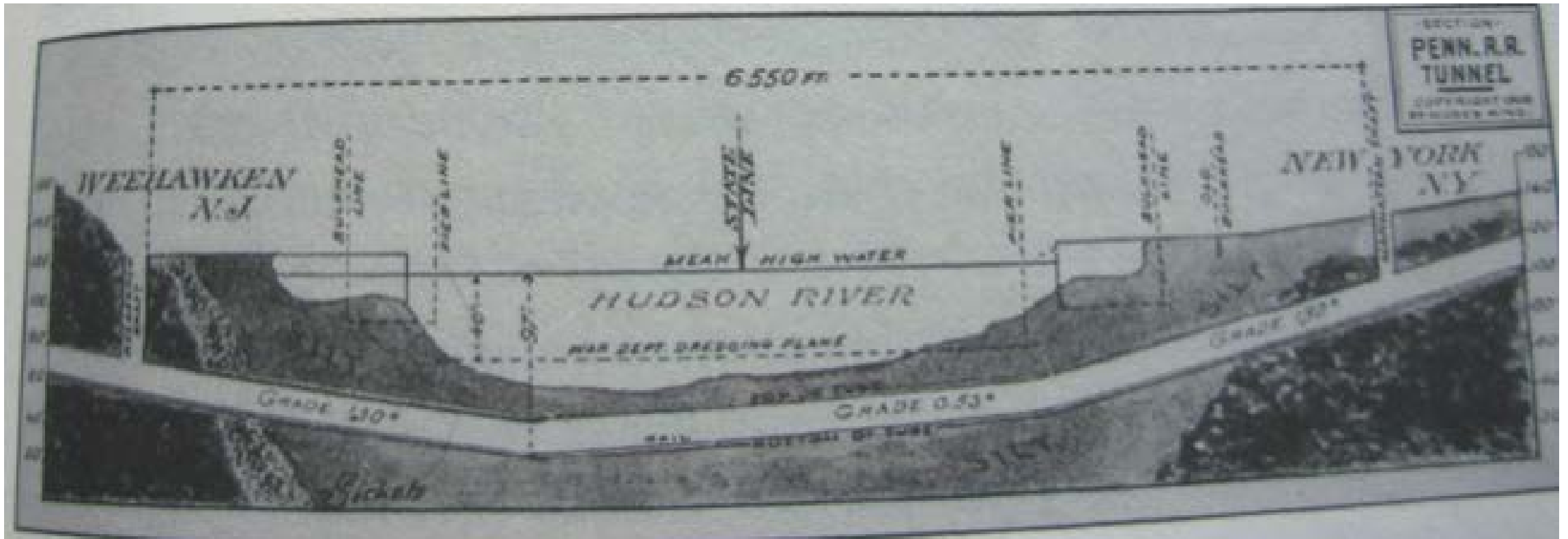
- A floating ferry service for trains?
- Complete PATH tunnels and run trolleys?
- Build new trolley tunnels?
- Come via Brooklyn?
- Build Gustav Lindenthal's North River (i.e. Hudson) Bridge
 - Federally chartered and to be shared by all railroads, including Vanderbilt's NY Central





Powerful Self Interests Eclipse the Greater Good

- Vanderbilts did not want other RR's in Manhattan and killed bridge project
 - Parallel with ARC – killed for political reasons?
- Cassatt discovers electric locomotives while in France and thinks tunnels
- As in 1910, massive endeavor like new tunnel requires patience, persistence, vision
- Must navigate tricky political waters while continuing to push forward



Luck & Politics

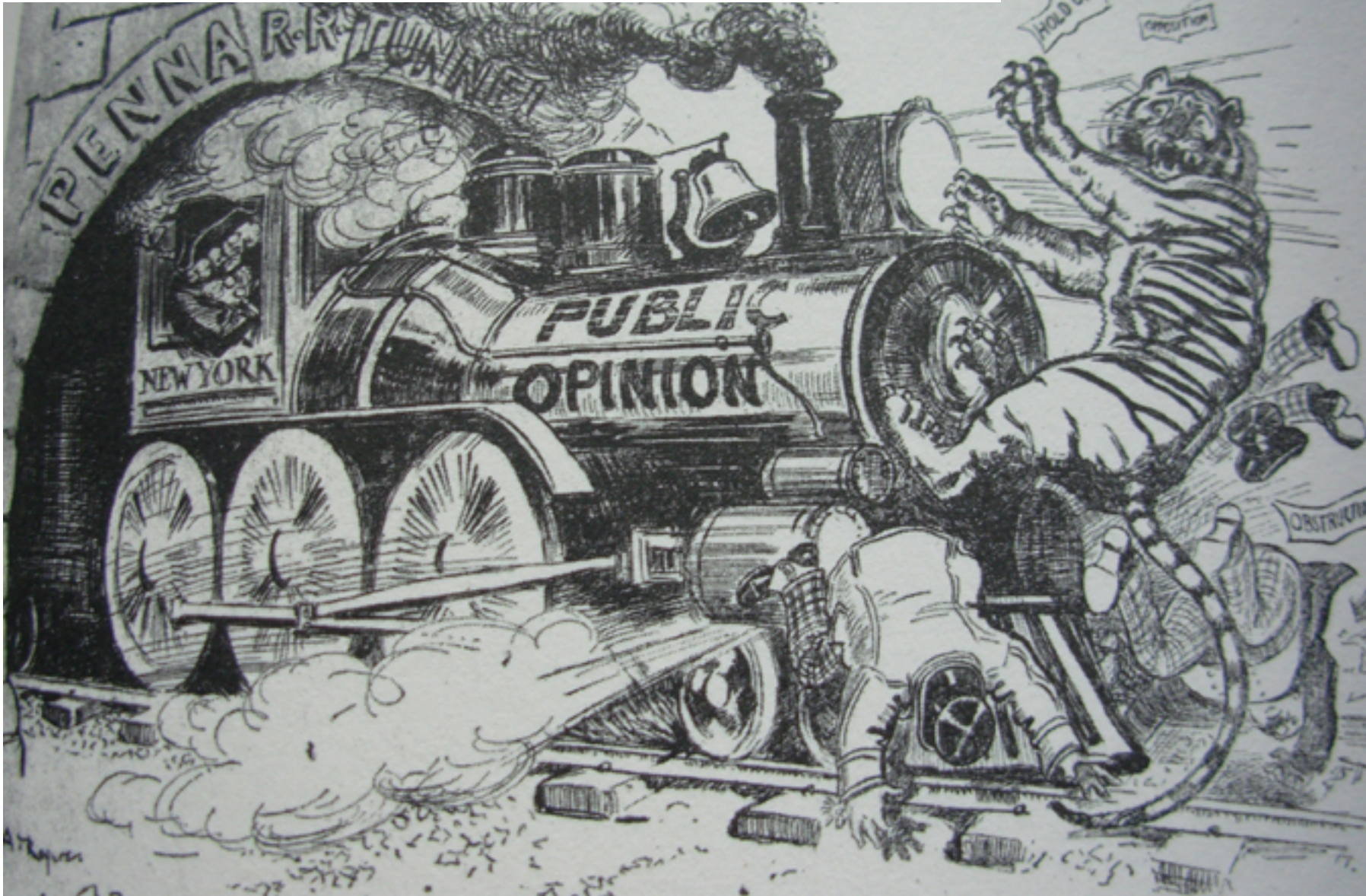
- Tammany boss William Croker
- Reform Mayor Seth Low
- Ice crisis & PRR refusal to pay bribes
- Aldermen held franchise “hostage”
- As NY businesses realize Cassatt won’t pay bribes, form pro-tunnel coalition to apply pressure and rally public support

“And so petitions in the tunnel’s favor began inundating the aldermen. Great department stores like R.H. Macy & Co. and Saks & Co., leading hoteliers from the Waldorf-Astoria, the Delavan, and the Navarre, real estate companies with major holdings, even fifty-two labor unions beseeched the dilatory aldermen ‘not to deprive New York City of this great project.’”

Conquering Gotham



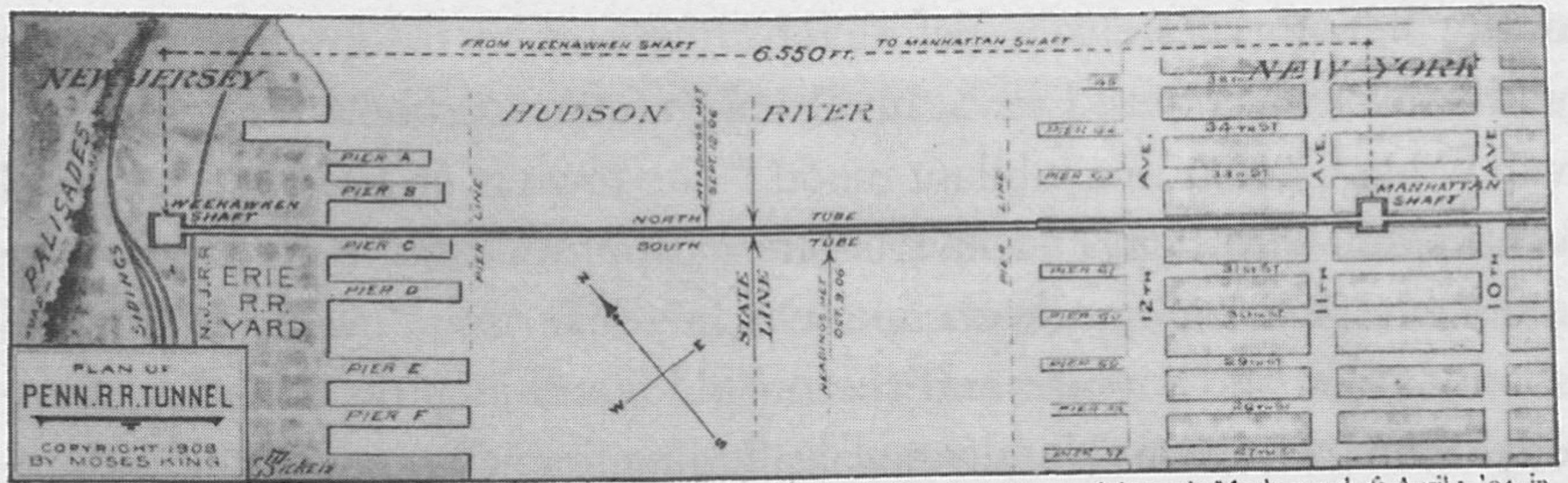
“A band of political buccaneers”



“Public opinion is overwhelmingly in favor of what is unquestionably one of the most valuable public improvements ever devised for the city. This nobody questions, but the franchise is held up by a band of political buccaneers ... it is hoped that ... a few of those who now oppose the franchise will come to their senses.”

Railroad Gazette, Dec. 12, 1901

The Trans-Hudson Challenge



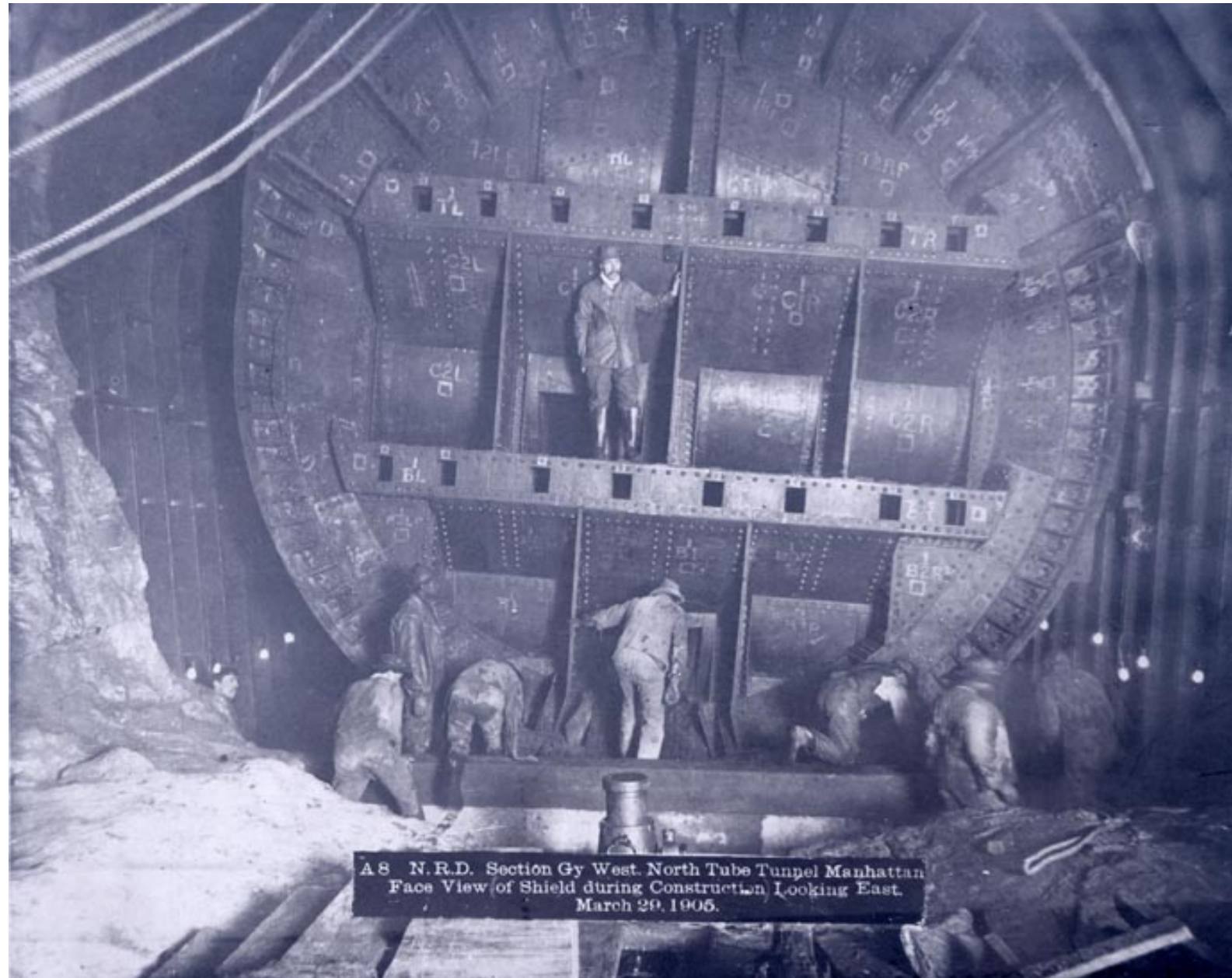
PENNSYLVANIA TUNNEL PLAN; contract let May 2, '04, to O'Rourke Eng. Con. Co.; work begun in Manhattan shaft April 1, '04, in Weehawken shaft Sept. 1; shields of north tube met 168 ft. west of state line Sept. 12, '06, south tube, 370 ft. east of state line, Oct. 9, '06.

How to Build?

- Extremely dense rock beneath the NJ Palisades
- Glacial silt beneath the Hudson
- Manhattan bulkhead

“About the most treacherous material through which submarine tunneling has ever been attempted . . . the silt is so yielding and semi-fluid in consistency that it is quite doubtful whether an ordinary cast-iron-lined tunnel would not be distorted and fractured by the movements of the trains.”

Engineering News, 1901



Tunnels shifting – An Existential Crisis





“From the very start, when Rea had contemplated how best to span the Hudson River, he had wondered, ‘Can a proper tunnel be constructed through the silt formation which is there encountered that will, after completion, withstand the rack and wear and tear of heavy trains passing through at high speed?’ He had been convinced it could, but since learning that the tunnels were moving about in the silt, now wondered anew, ‘Would not the structure ‘work’ under the action of the heavy trains? We have no precedent to go by, as all subaqueous tunnels of like construction are through a different formation than is found at New York. Therefore, it is largely a matter of speculation.’”

Conquering Gotham



Success!

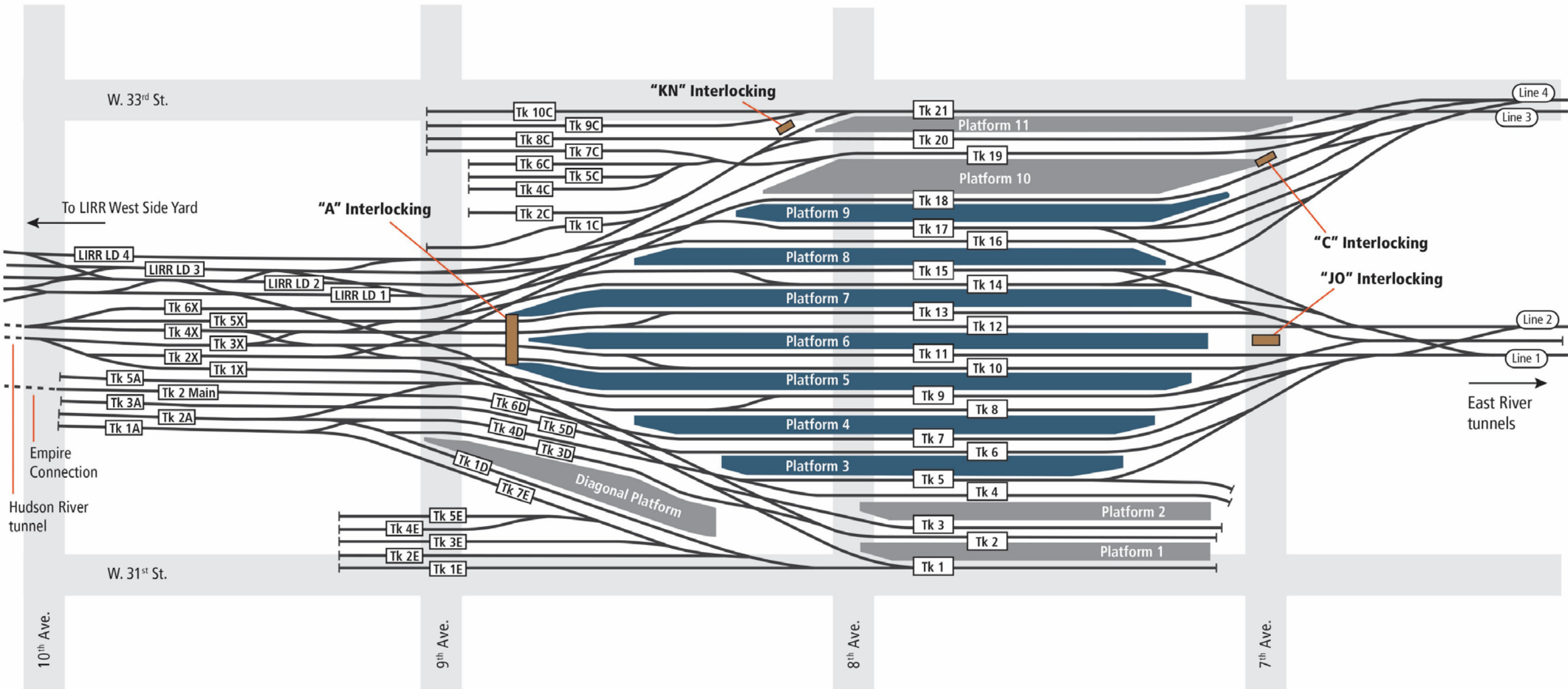
- 2 tubes
- 23 feet in diameter
- Driven 6,000 feet under water
- 1,263 cast-iron rings
- Men of all nationalities, races
- “The Shields Have Met Exactly”
- September 11, 1906

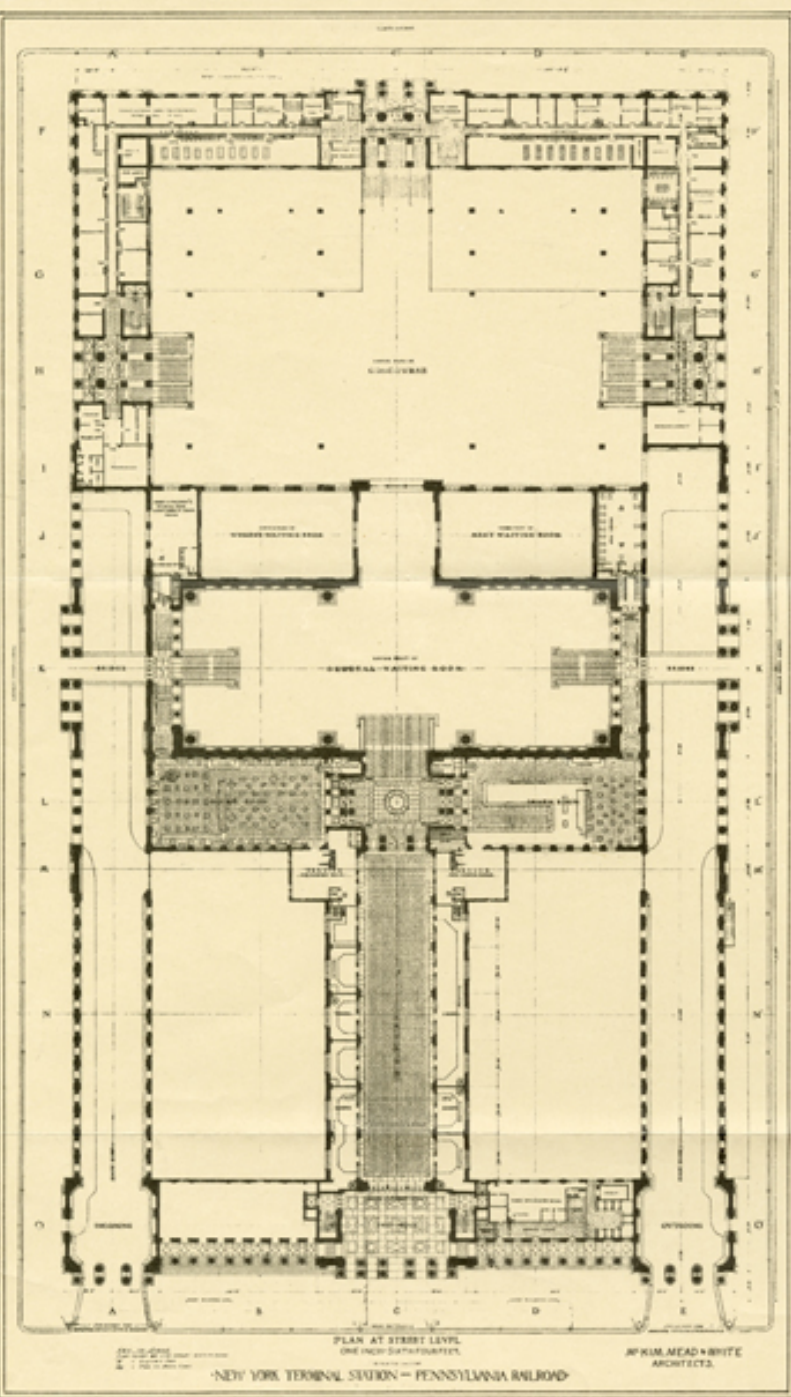






System Not Designed for Heavy Commuter Use





The preponderance of suburban commuters at Penn Station was not just unanticipated, it was “a problem because the station, from track layout to support spaces, was not designed to serve commuter traffic. The large majority of users were confined to cramped quarters. They moved underground, from commuter shuttles to subways and streets, without cause to enter McKim’s uplifting vaulted spaces. Millions of people were using Penn Station, but not as McKim had intended.”

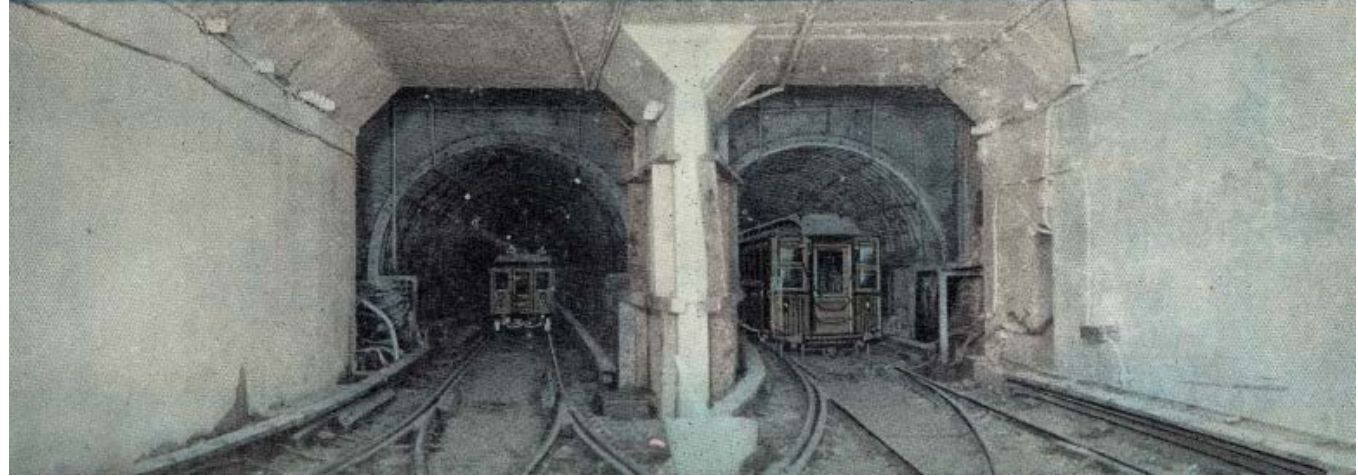
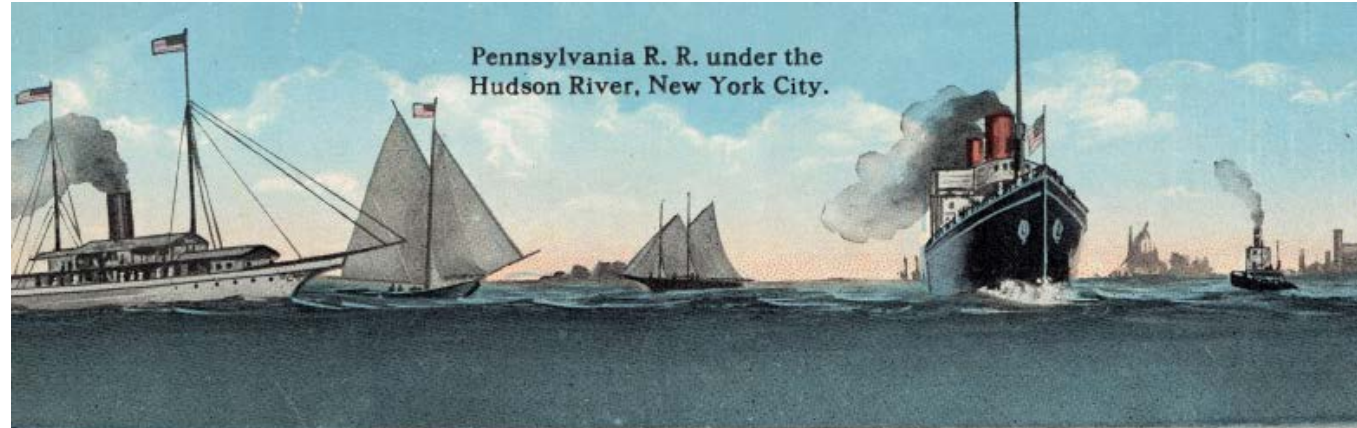
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Hope for the Future: Gateway & Moynihan



Hope for the Future: Gateway & Moynihan





ALEXANDER · JOHNSTON · CASSATT
PRESIDENT · PENNSYLVANIA · RAILROAD · COMPANY
1899-1906

“We are planning for the future, as we ought to do, and not for the present only, and if any persons are doubtful ... they fail to appreciate the strength of [our] corporation, and those who doubt that it will ultimately pay have little faith in the future of this country.”

*A.J. Cassatt to Samuel Rea
August 29, 1904*



SAMUEL · REA ·
VICE · PRESIDENT · 1899-1912 · PRESIDENT · 1913-1925
PENNSYLVANIA · RAILROAD · COMPANY

Thank you!



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