



Charles Baillairgé (1826-1906)

The September 19th 1889 rock slide along Champlain Street in Québec City, a catastrophe foretold by Charles Baillairgé

By

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Main objectives of the presentation:

- Who is Charles Baillairgé ?
- Present the 1889 rock slide;
- Show how it was foretold by Baillairgé;
- Comment on the 1894 Supreme Court ruling.

View from the Citadel of Quebec.

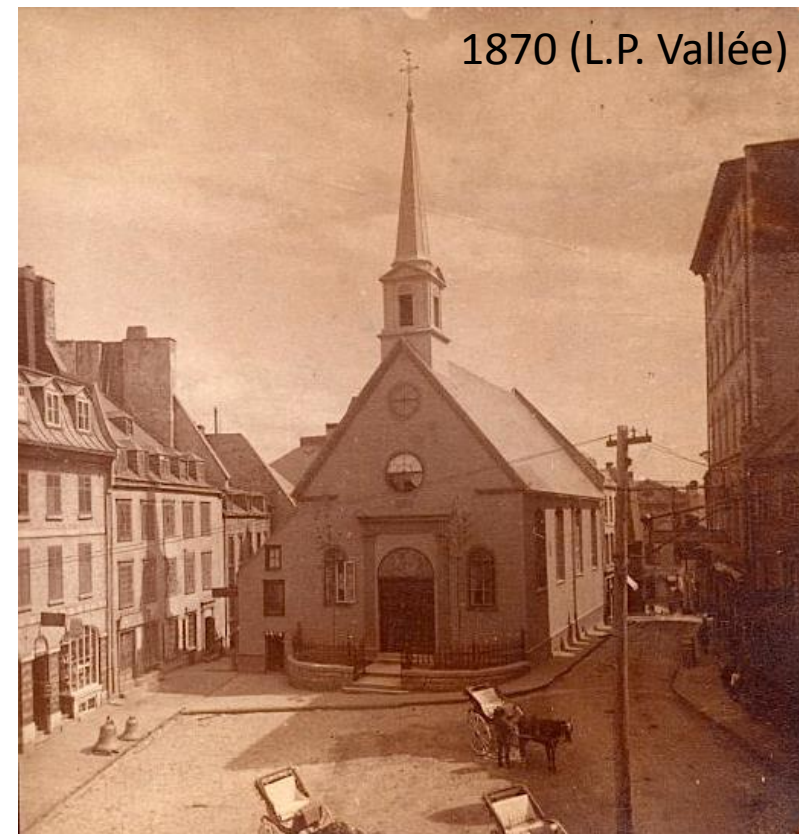
A view from the King's Bastion, by R. Wallis 1840, source: Archives de la Ville de Québec

About Charles Baillairgé!

According to Christina Cameron (1989) and Jean-Marie Lebel (2014) Charles Baillairgé was:

- From a family long known in Quebec City, his grandfather lead the reconstruction of the Notre-Dame-des-Victoires church soon after 1760.
- Was well known in Québec City, had an opinion on everything, was a civil engineer (City engineer), architect, land surveyor, mathematician, prolific author, popular speaker and... father of 20 children!

In 1843, at the age of 17, he built and used a two cylinder steam powered vehicle (may be the first car in North America?). The authorities stopped him from using it because it was too noisy and disturb the horses!



The architect



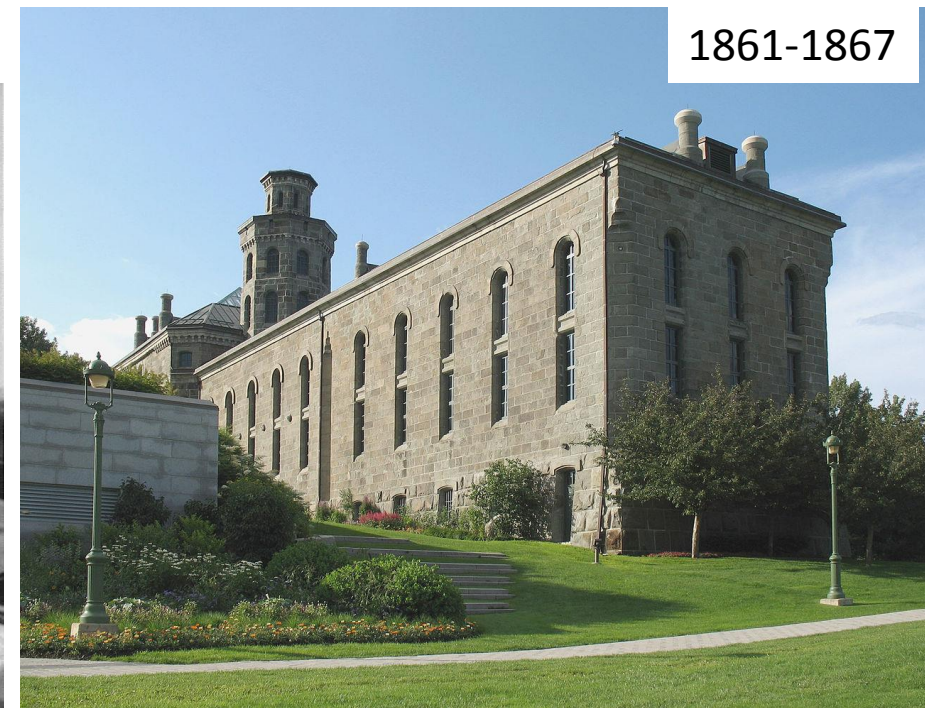
Charles Baillairgé
(1826-1906)

Sainte-Marie de Beauce
church of neo-gothic style
built in 1859, and Terrace
Dufferin (1879)



1878

With Thomas Fuller, were principal architects for the completion of the Parliament of Canada (old)

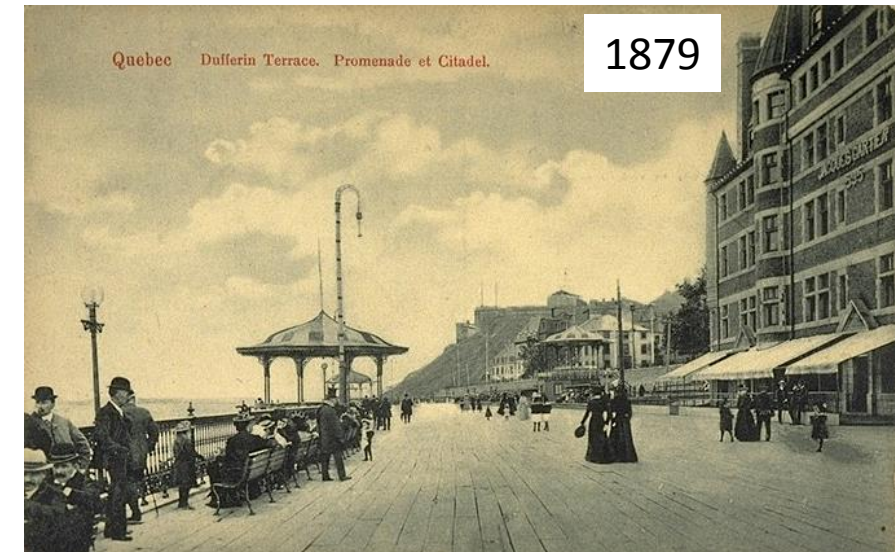


1861-1867

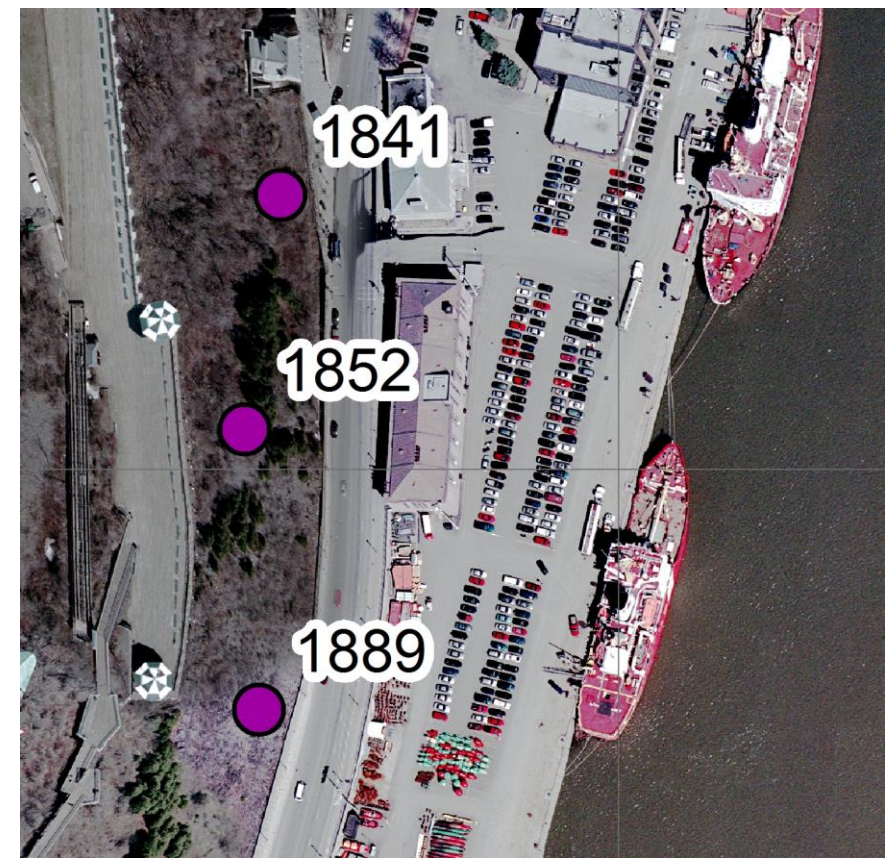
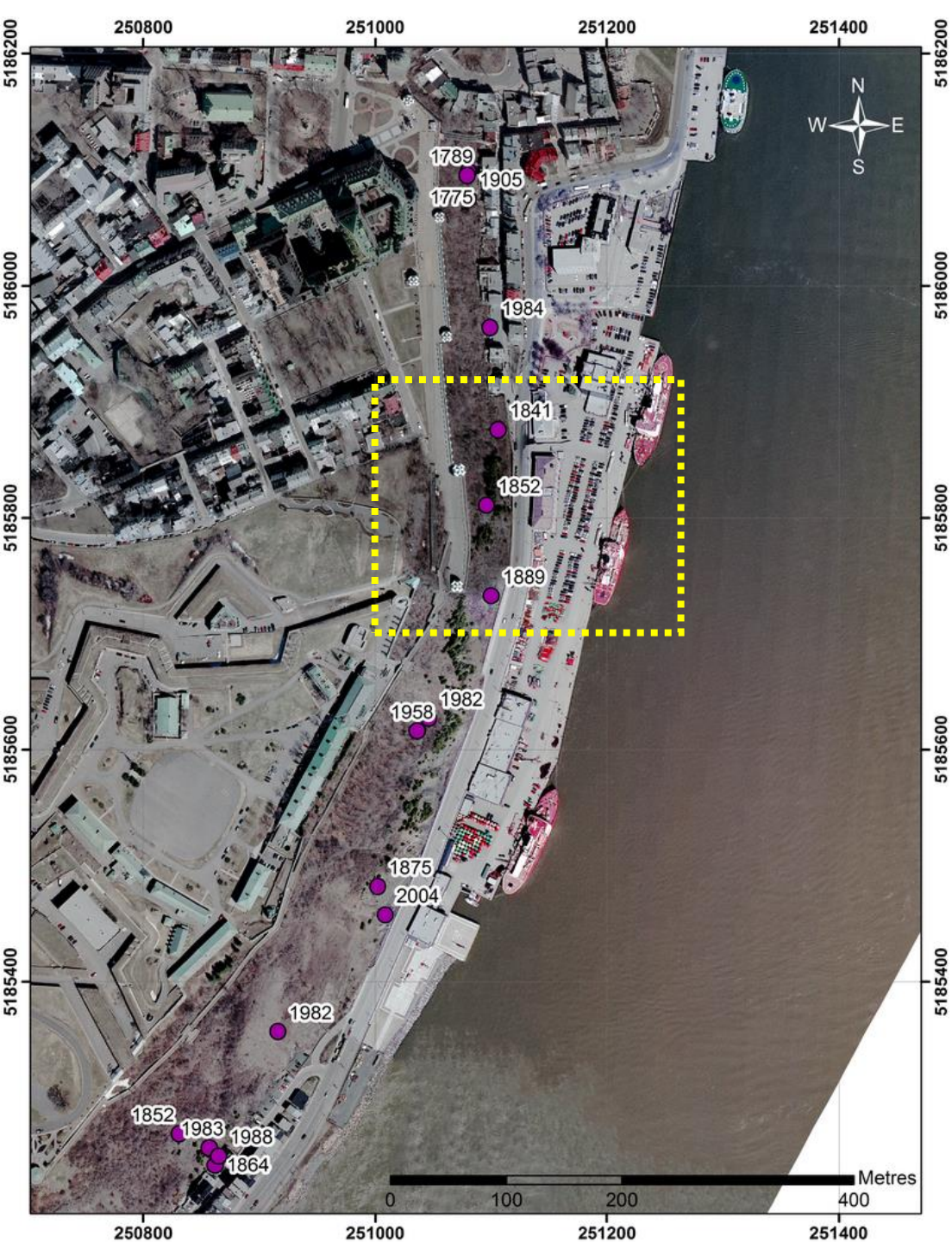
Old Jail of Québec, now name Baillairgé's building which is part of the Musée national des beaux-arts du Québec (style neo-renaissance)



1859



1879



Frist slide recorded is in 1775, but will concentrate on the 1841, 1852 and 1889 events along **Champlain street** (a slide frequency of about 1 every 25 years since 1775, Baillifard et al. 2004)

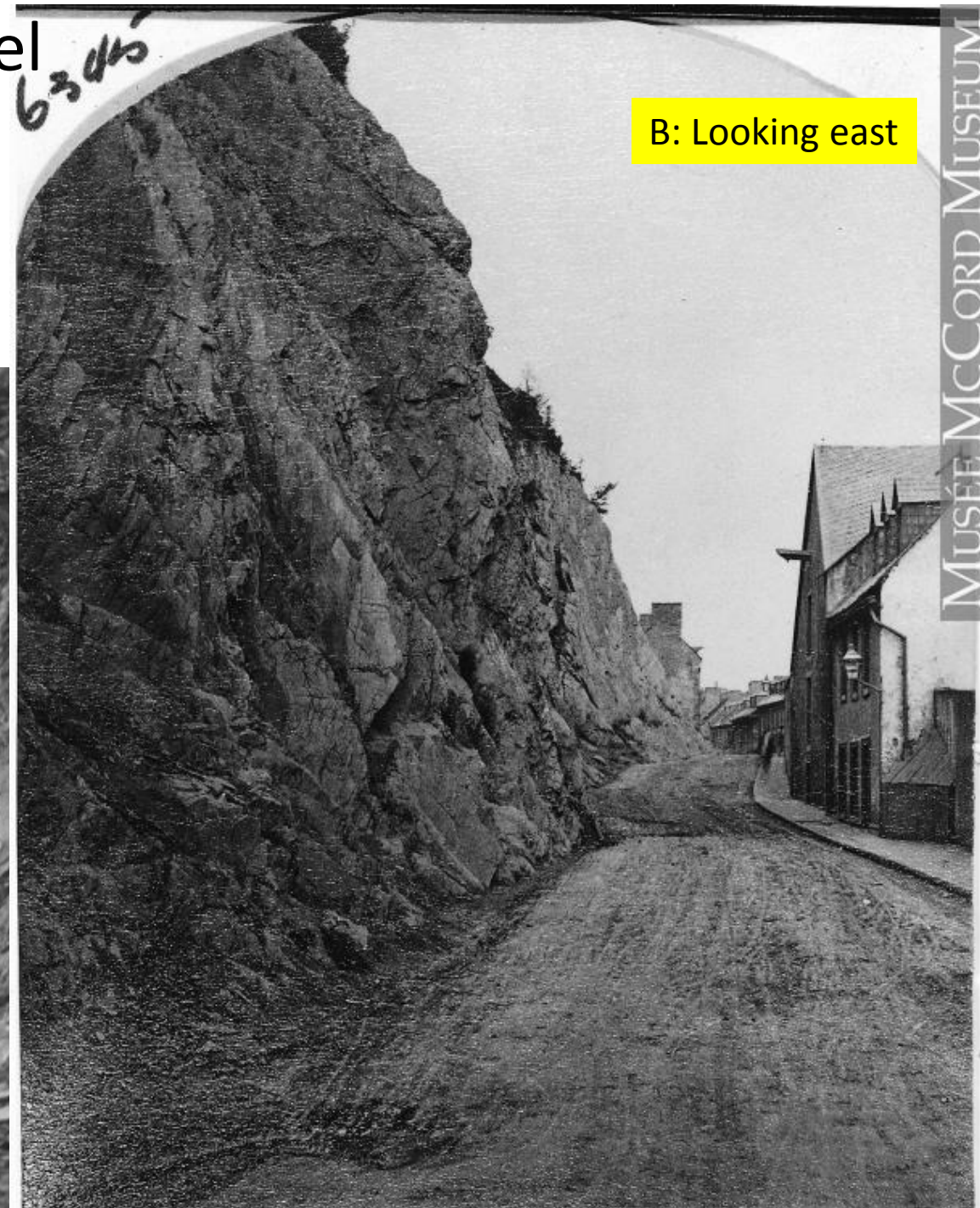
The Champlain Street below the Citadel

Sedimentary rocks, nearly vertical strata with overhang in certain sector: a slide prone area!

A: Looking west



W. Notman, 1865



B: Looking east

MUSÉE McCORD MUSEUM

The September 19th 1889
rock slide along Champlain
Street (35 casualties, 30
injured)



Québec 1889

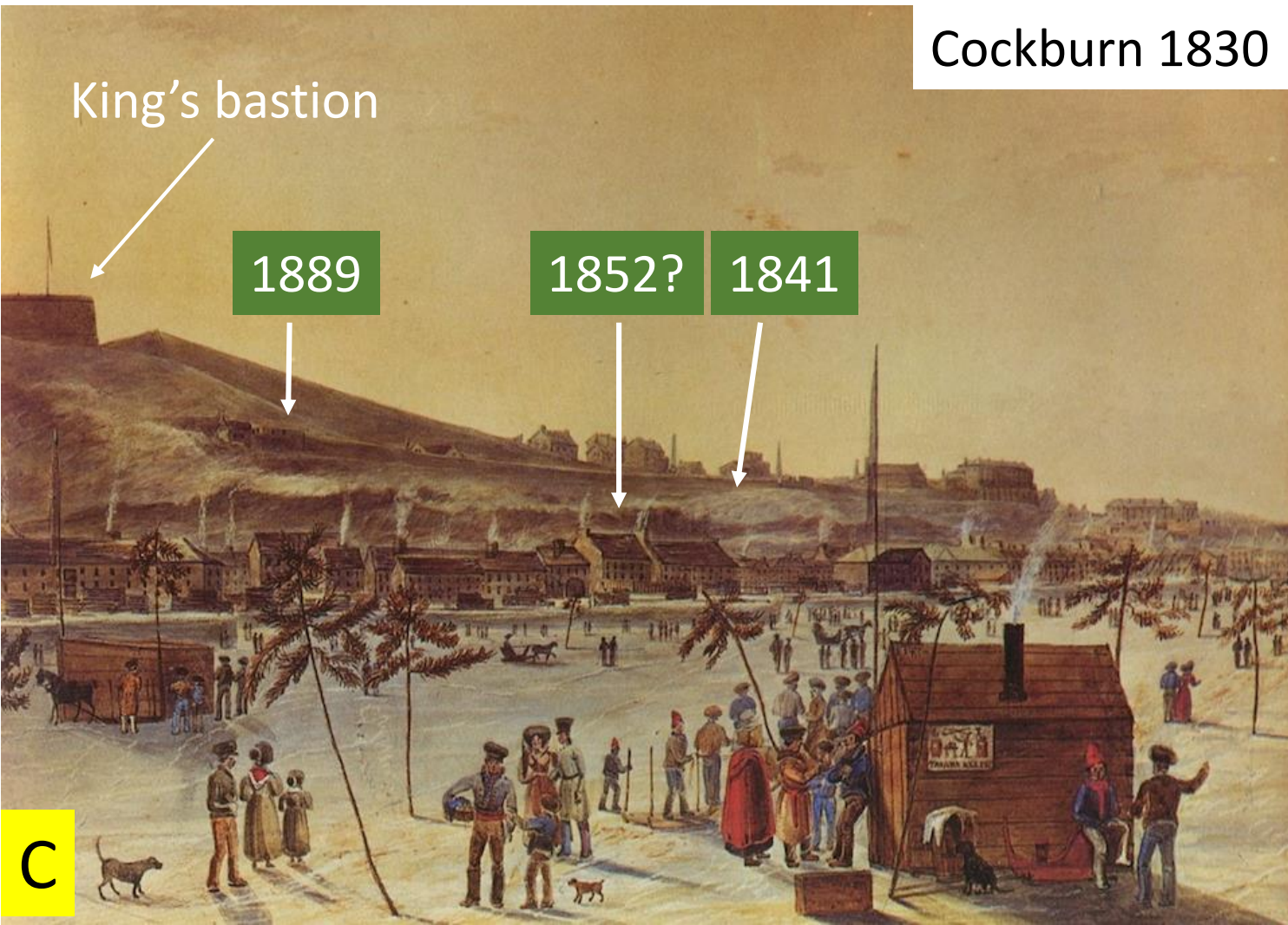
Headwall scarp,
Fissure 'b'



Photographs by Livernois 1889

View of the Champlain Cliff (Québec City) before 1841

Note: Photographs only began around 1860.



Cockburn 1830



Hunter 1778



Cockburn 1833

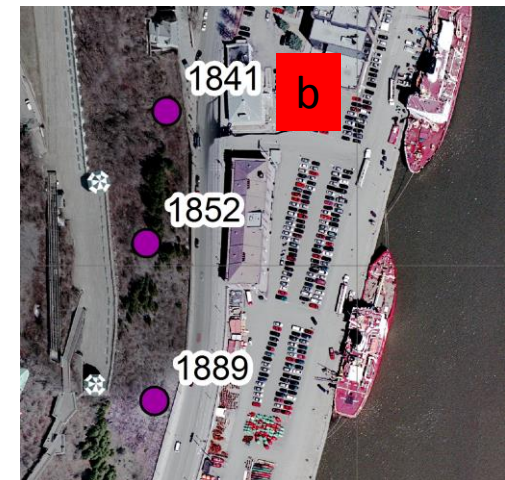
According to Bennet (2013), Joseph Légaré (1841) painted it as a sort of criticism of the government's attitude towards lower class people.

May 17th 1841

- 32 casualties and 32 injured
- Few days of heavy rain, filling fissures
- Excavation at the toe of the slope
- Involved the whole slope and wall above
- Slope belongs to the owner below!



A first visual record of a rock slide in Canada ?



pre-1889

1852?

1841

1870

scarp

a

b

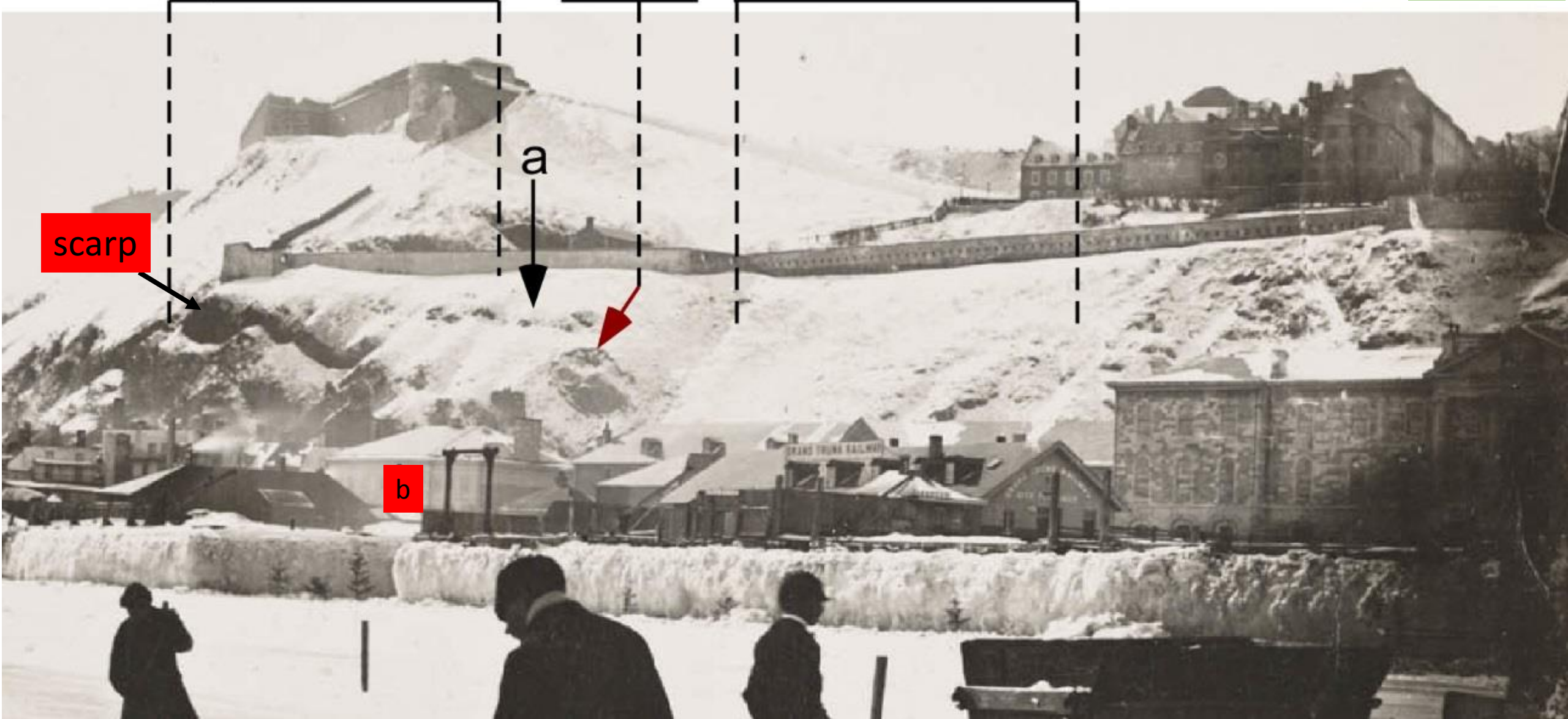
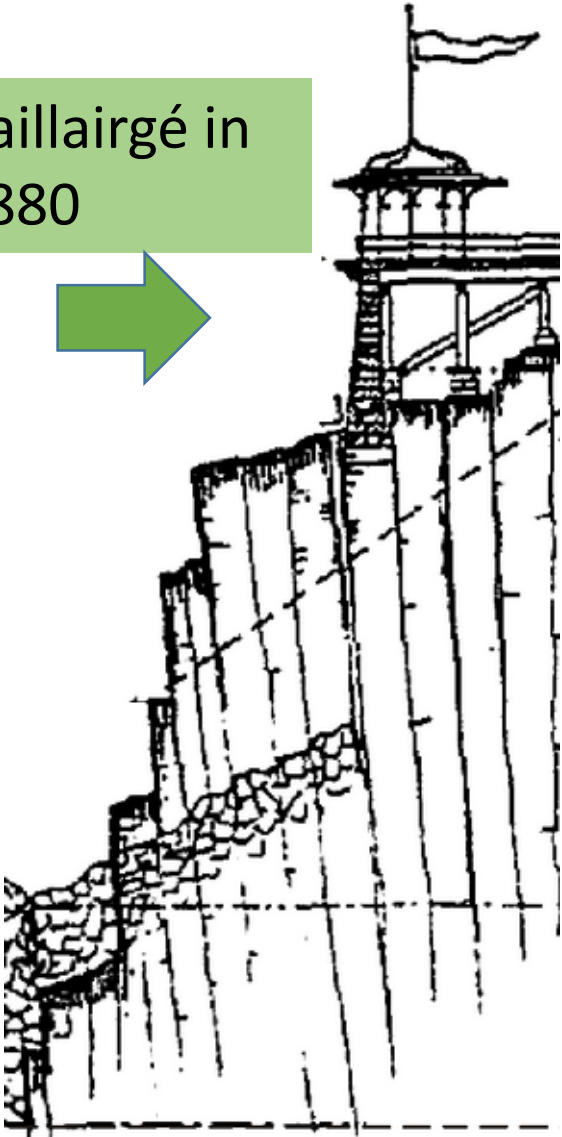


Photo by Livernois 1870

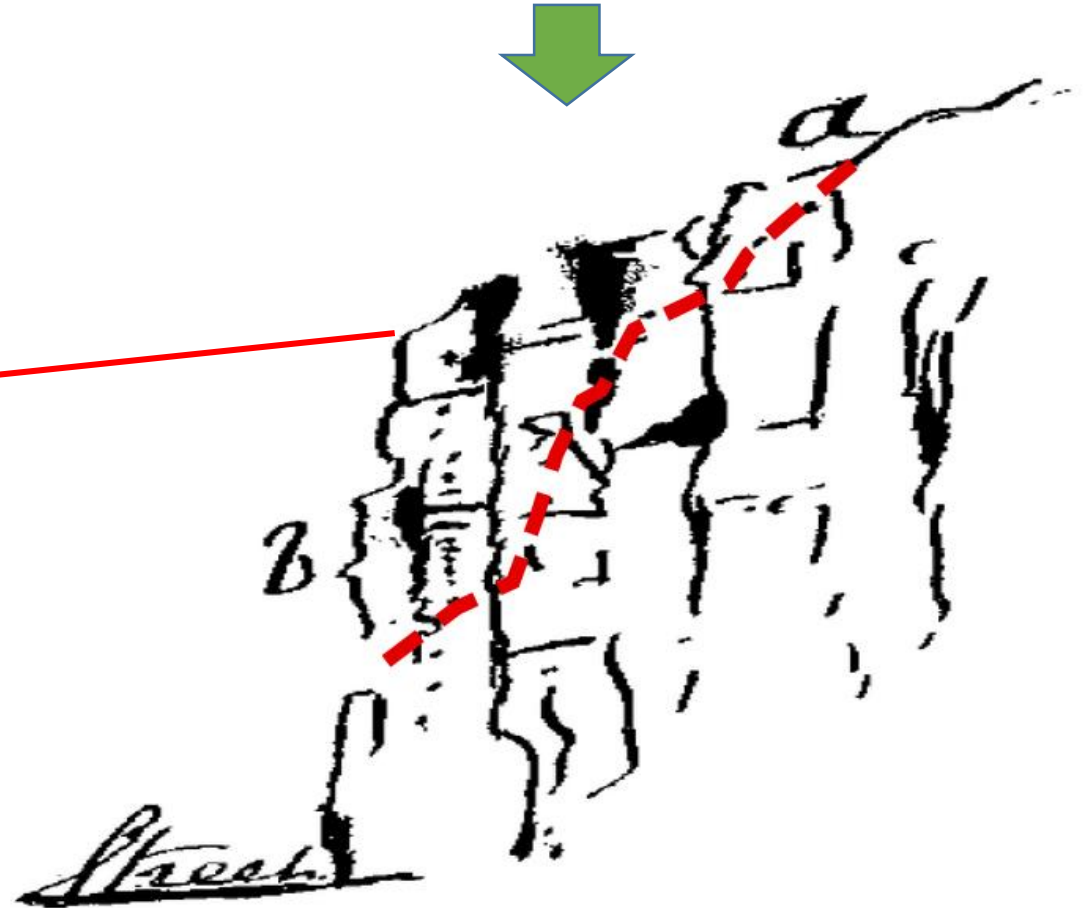
Soon after 1841 there were many petitions asking for mitigation measures along the Champlain cliff, as also requested by Cole (1842) and Baillairgé (1880) who also investigated the 1852 slide (9 casualties)

Baillairgé in
1880

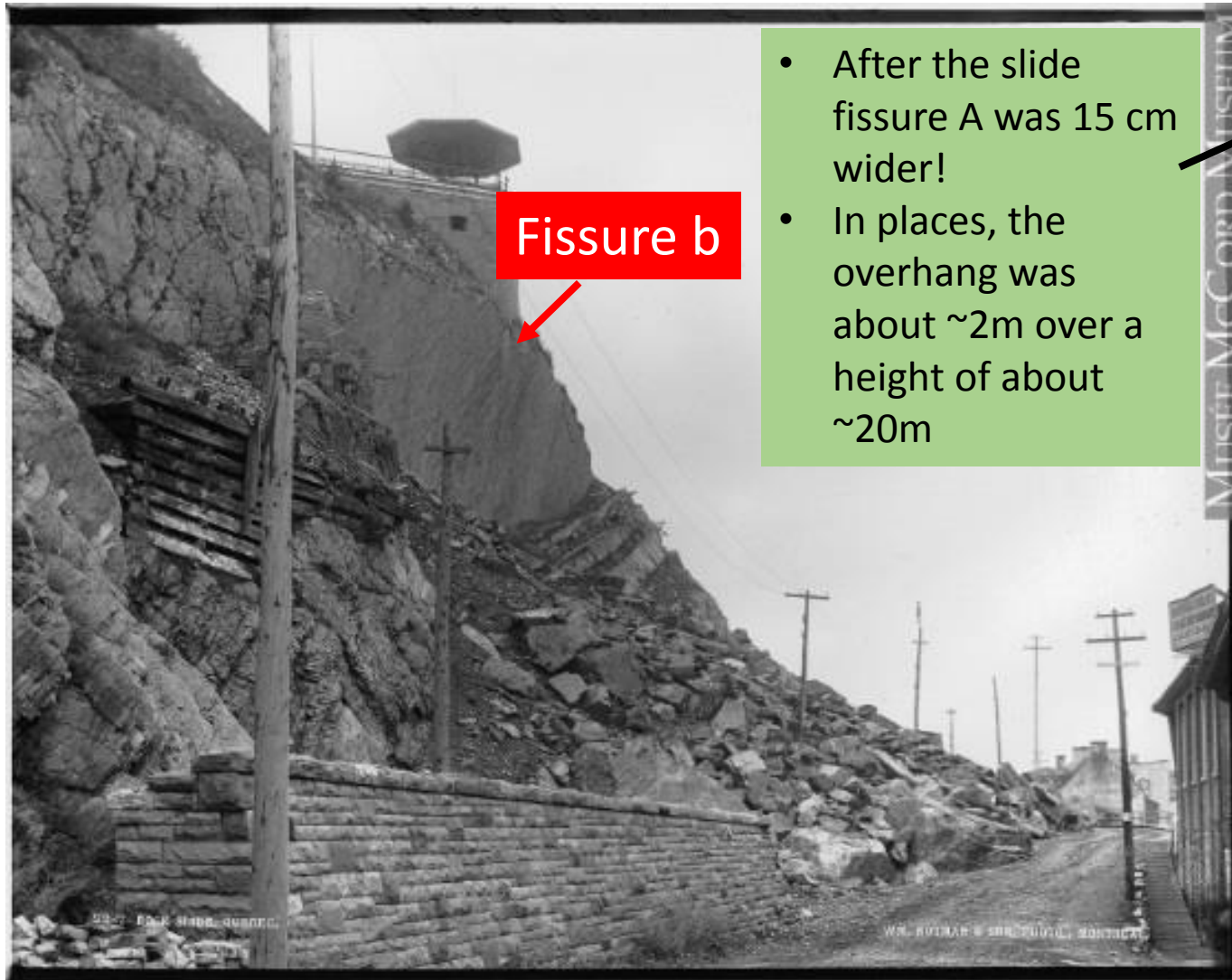


Livernois in 1870

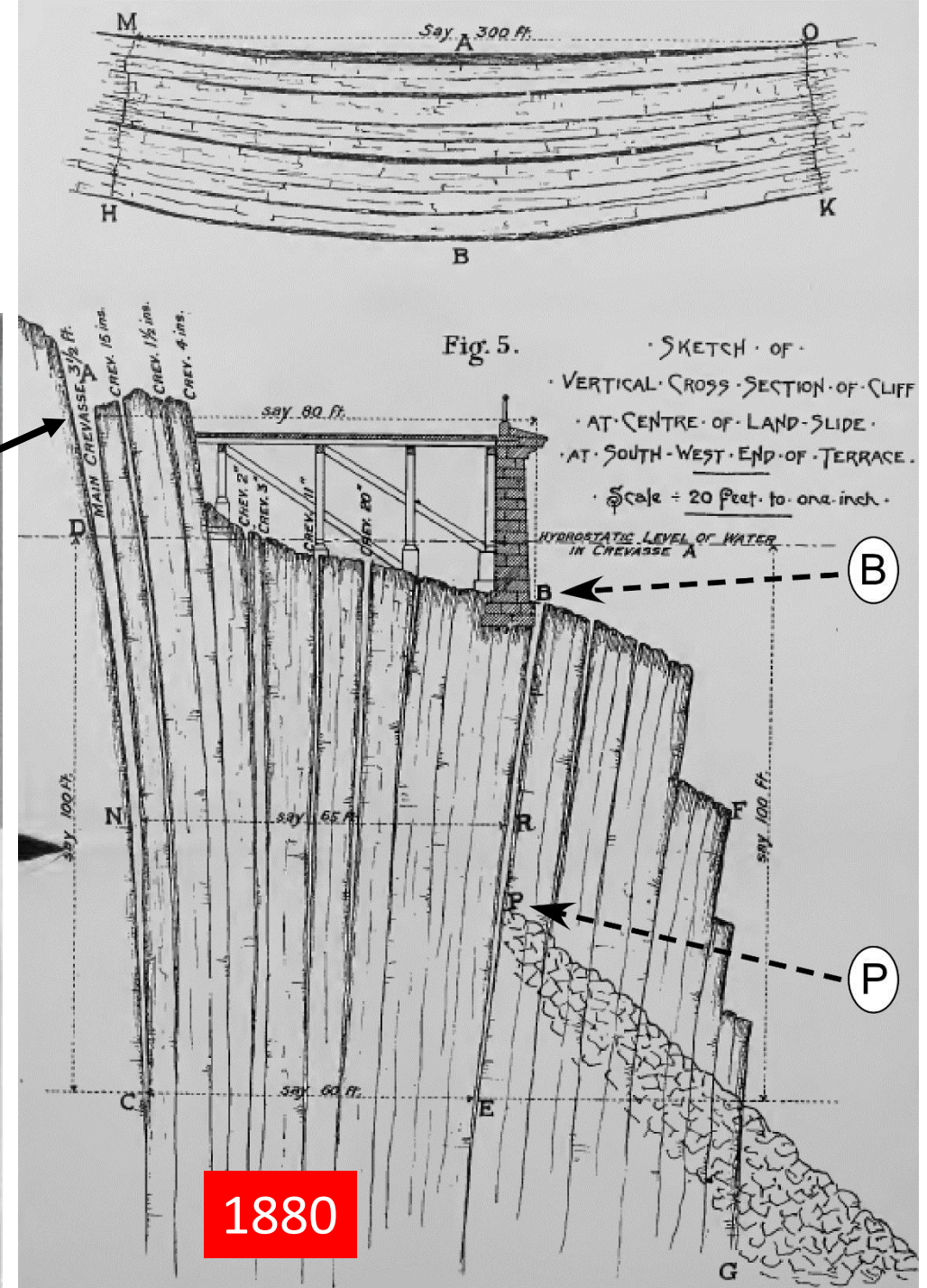
Major Cole's recommendation in 1842



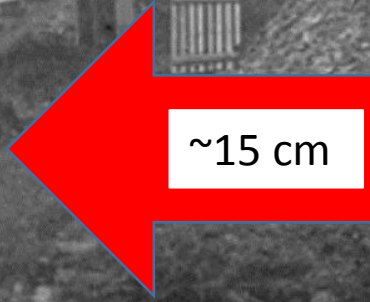
Baillairgé in 1880: a toppling failure



- After the slide fissure A was 15 cm wider!
- In places, the overhang was about ~2m over a height of about ~20m



- The slide, caused fissure A to widen by ~15 cm



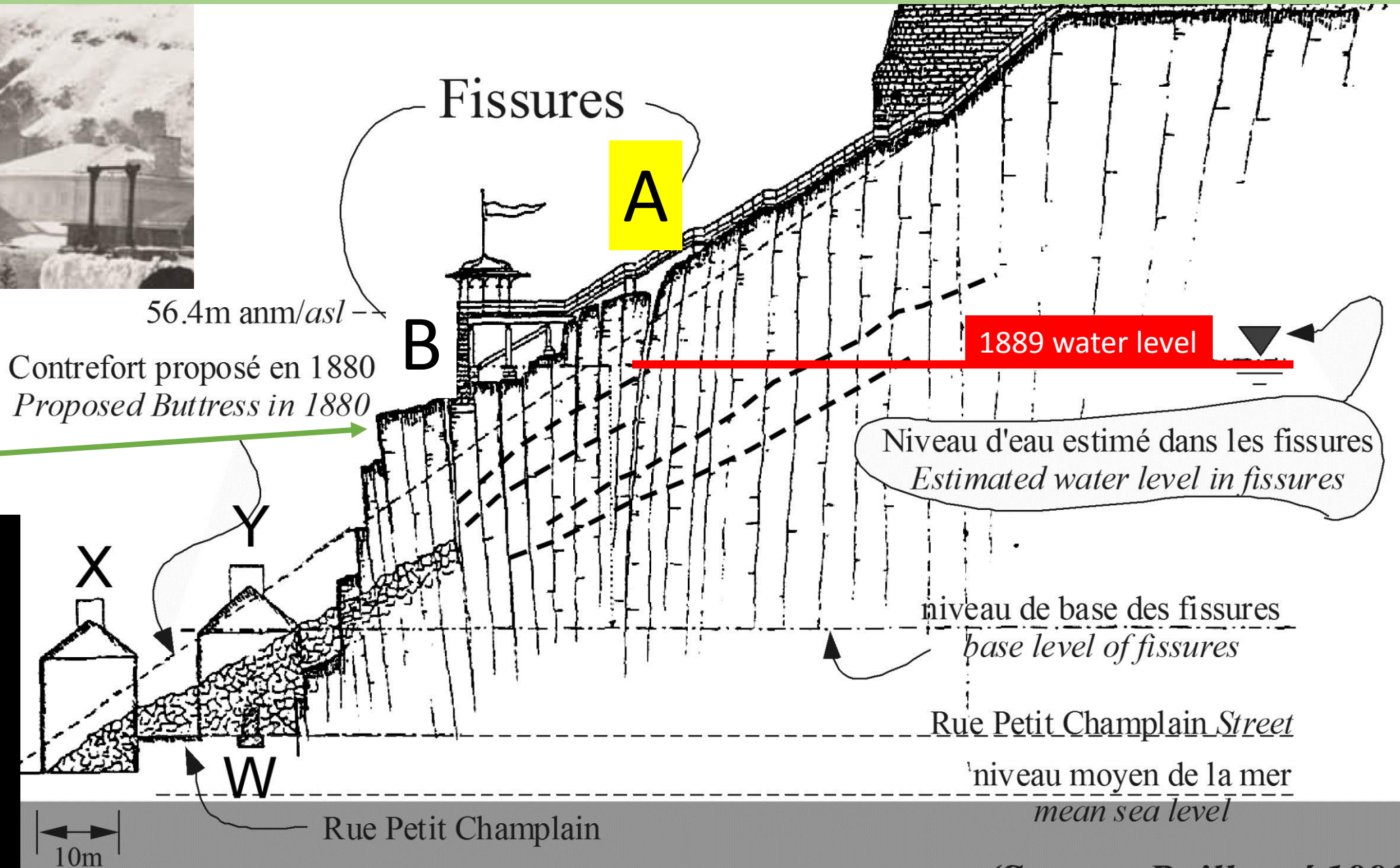
Livernois 1879

Baillairgé's recommendations in 1880 and actual mitigations



scarp

Only houses at the toe of the slopes (Y) were removed before 1889 and a small retaining wall built (W)



(Source: Baillargé 1893)

Fossé / Ditch

Baillaigé's recommendation in 1880 and the 1889 situation

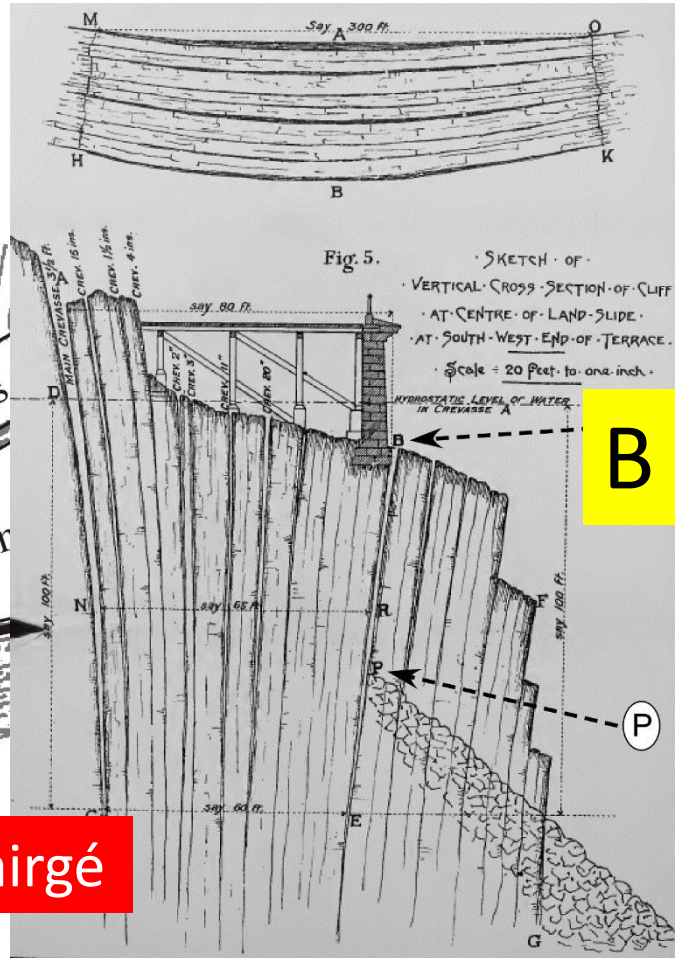


Entrée du drain
/ Drain entrance

Broken drain

Fissure B

Mitigation proposed by Baillaigé



Contrefort
Buttress

Petit Champlain

Extent of the debris

10m

(Source: Baillaigé 1893)

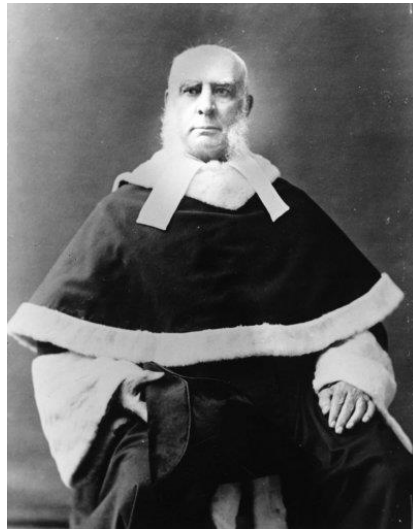
The 9th of October 1894 Supreme Court of Canada judgement: The City of Québec versus the Queen on an appeal from the Exchequer Court of Canada



(Common Law: no negligence)

Held by Taschereau, Gwynne and King

...affirming the decision of the Exchequer Court, that as the injury to the property of the city did not occur upon a public work, subsec. (c) of the above Act did not make the Crown liable, and, moreover, there was no evidence that the injury was caused by the negligence of any officer or servant of the Crown while acting within the scope of his duties or employment.



S. H. Strong,
Chief of Justice
in 1894



(Code de Napoléon: bon voisinage)

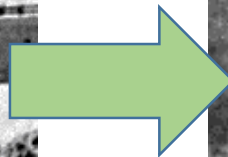
Held by Strong and Founier

...that this case should be decided according to the law. of Quebec, regulating the rights and duties of proprietors of land situated on different levels; and that under such law the Crown, as proprietor of land on the higher level, was bound to keep the drain thereon in good repair and was not relieved from liability, for damage caused by neglect to do so by the ignorance of its officers of the existence of the drain.

(1894) 24 SCR 420



1897



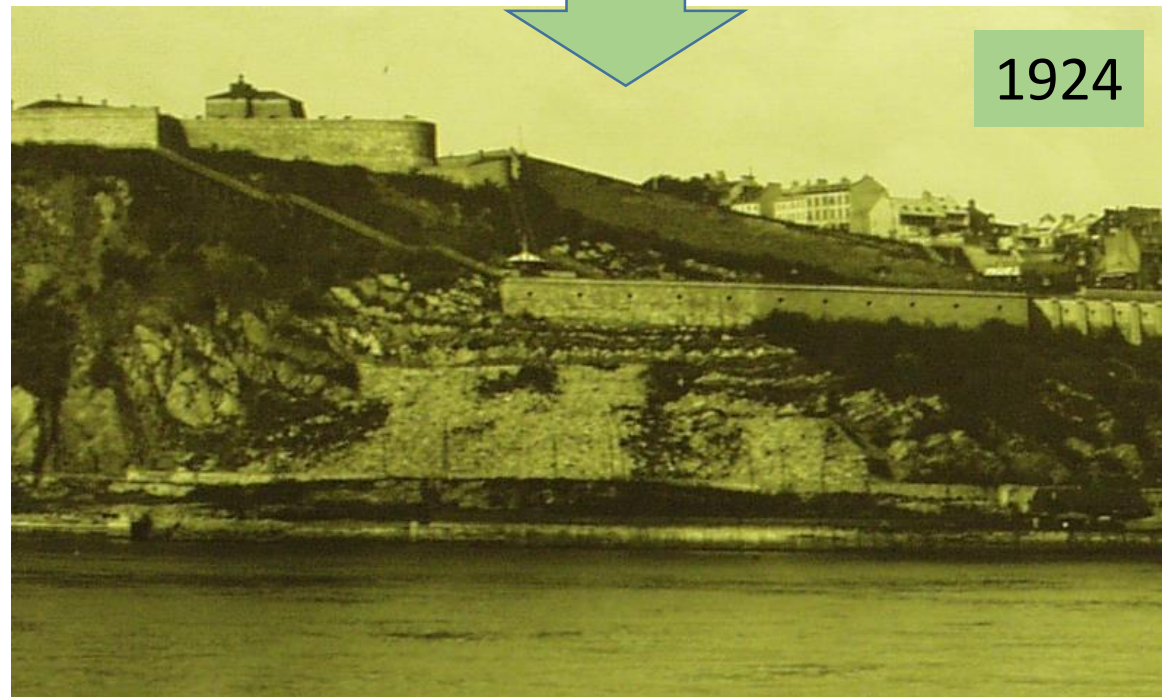
Towards a solution !



1932 stamps!



1924



Concluding Remarks

- The 1889 slide was a foretold;
- Baillairgé likely carried out the first detailed analysis of an active slide (toppling failure);
- He made recommendations which, if they had been followed completely, would have prevented the catastrophe;
- The Supreme Court ruling favored the concept of negligence over that of bon voisinage (good neighborhood). Any influence on following cases?



Petit Champlain Street today

Acknowledgements

Thanks to the Heritage Committee for inviting me, the Service des archives of the City of Québec, and collaborators: Dominique Turmel, Milène Sansoucy, François-Joseph Baillifard, Gabriel Robichaud and Michel Jaboyedoff. Thanks to my reviewer: Catherine Cloutier and Mustapha Zergoun.

Merci....



View of Quebec city in 1817 by T. Dixon, source: Musée national des Beaux Arts du Québec.