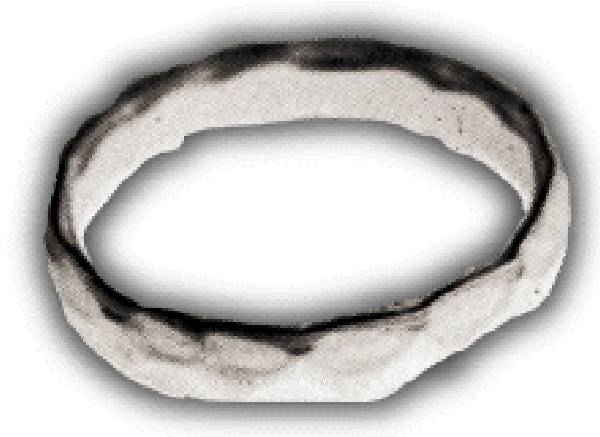


# Q uebec B ridge D isaster and The Iron R ing



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Team : 1

# O verview

- ? History
- ? Collapse of the bridge
- ? After Collapse
- ? Ethical Issues
  - à Key Events
  - à Violation of Ethical Issues
    - ? Rule of Practise (NSPE)
- ? Conclusion
- ? The Iron Ring

# H i s t o r y

## ? N e e d f o r a B r i d g e

- à W i n t e r p r o b l e m
- à P u b l i c ' s i n t e r e s t
- à Q u e b e c B r i d g e C o m p a n y
  - à E d w a r d A . H o a r e

## ? B e g i n n i n g t o P l a n

- à H i r e d T h e o d o r e C o o p e r a s c o n s u l t i n g e n g i n e e r
- à T h e c a n t i l e v e r s u p e r s t r u c t u r e p l a n f r o m P h o e n i x B r i d g e C o m p a n y

## ? C h a n g e s i n D e s i g n

- à T o i n c r e a s e t h e c h a n n e l s p a n o f t h e b r i d g e f r o m 1,600 ft t o 1,800 ft
- à T o m a x i m i z e u n i t s t r e s s

# H istory (continued)

## ? Cooper's Health Problem

- à Kept him away from construction site
- à Norman McClure (a recently graduated Civil Engineer)

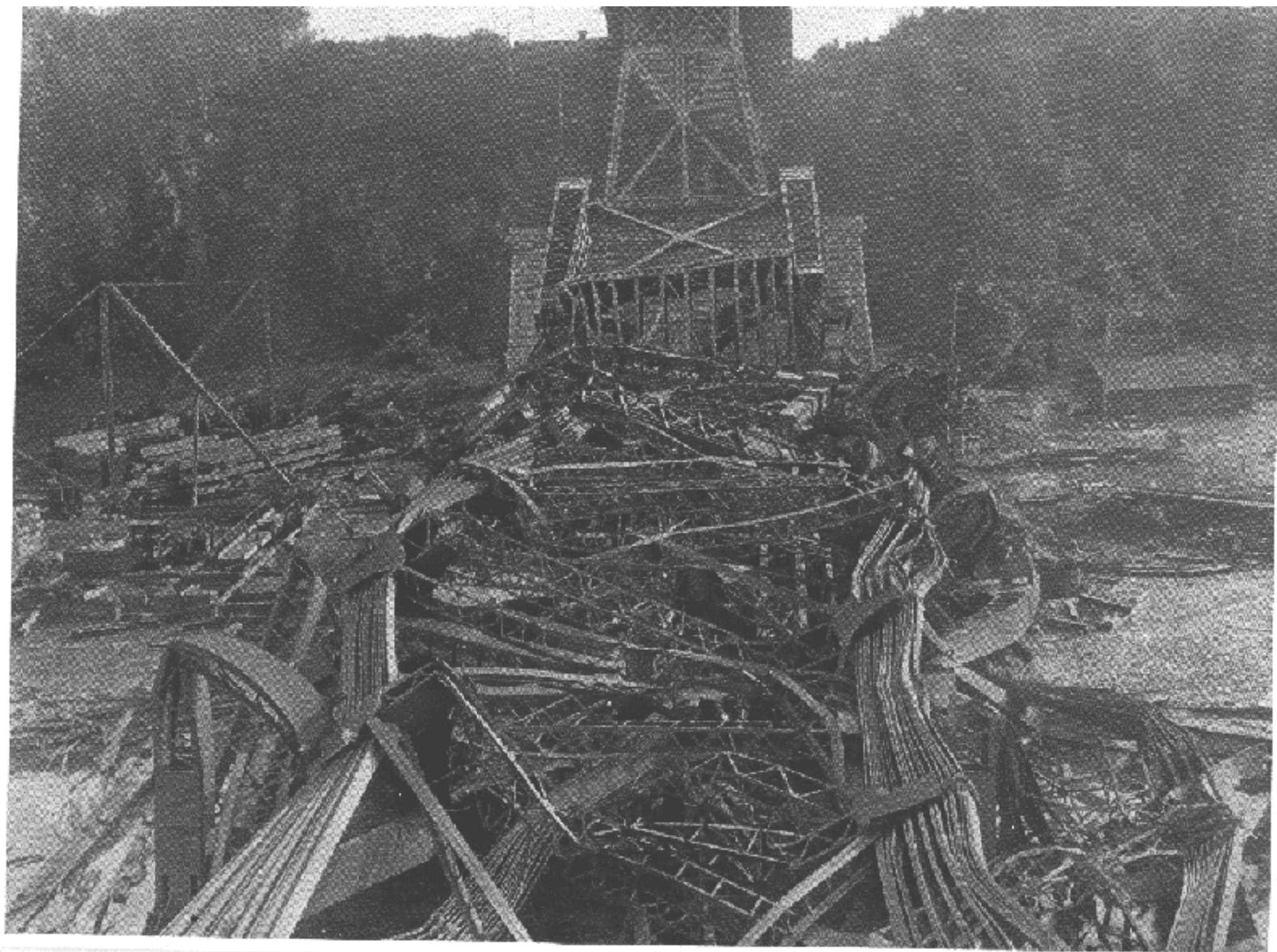
## ? Signs of Disaster

- à Phoneix never re-calculated the weight of the bridge after modifications
- à Weight exceeded the estimated weight by a substantial amount
- à Misalignment between chords

# Collapse of the bridge

## ? Disaster

- à At 5:30 on the afternoon of August 29, 1907
- à Eighty-six men were on the bridge at that time, only eleven survived



# A fter C ollapse

- ? The member of the Royal Commision of Inquiry investigated the collaspe in 1908
- ? Cooper's opinion was justified
- ? Failure due to misjudgment
- ? Project was given to independent Canadian organizations
  - à The Collapse of September 11, 1916
  - à Open to traffic on December 3,1917

# Ethical Issues

## ? Key Events

- à Problem in the initial design of the bridge
- à Cooper's health
- à Not doing re-calculation of modified design
- à Misjudgment by Cooper
- à McLure neglected to wire Cooper's decision to Quebec
- à No effort made to alarm the workers
- à Phoenix's assurance that it is safer to continue the work



# Violation of Ethical Issues

- ? **Negligence:** the “failure to be sufficiently carefully in a matter in which one has moral responsibility to exercise care.”
- ? **Responsibility:** “The moral and forward-looking sense of responsibility is the sense in which one is responsible for achieving (or maintaining) a good result in some matter”
- ? **Lack of Experience**
- ? **Selfishness**
- ? **Misjudgment**

(definitions obtained from [www.onlineethics.org](http://www.onlineethics.org))

# Rule of Practise

(National Society of Professional Engineers (NSPE))

- ? “If engineers' judgment is overruled under circumstances that endanger life or property, they shall notify their employer or client and such other authority as may be appropriate”
- ? “Engineers shall act for each employer or client as faithful agents or trustees”
- ? Engineers shall “[conduct] themselves honorably, responsibly, ethically and lawfully so as enhance the honor, reputation and usefulness of the profession”

([www.onlineethics.org](http://www.onlineethics.org))

# Conclusion

"Why do ethics play so important role in an engineering project?"

? Shows the difference between right and wrong

? If followed, provides satisfaction and assurance to the public

? Helps us to recognize those who are accountable for violating engineering practice

# The Iron Ring

## ? History

- à Needed to bind engineers together
- à “The Ritual of the Calling of an Engineer”
- à Since 1925, the Kipling Ritual issues iron rings to graduates

# The Iron Ring (continue)

? Symbolises

- à Pride

- à Responsibility

- à A bond between engineers across Canada

# R eferences

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