ROYAL COMMISSION

QUEBEC BRIDGE INQUIRY

1907

VOL. II.

MINUTES OF PROCEEDINGS

AND

PRINTED EXHIBITS

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ROYAL COMMISSION

QUEBEC BRIDGE INQUIRY

MINUTES OF PROCEEDINGS

QUEBEC, P.Q., September 9, 1907.

The Royal Commission appointed to conduct an investigation into the cause of the collapse of the Quebec bridge in the course of construction over the St. Lawrence river, near the city of Quebec, and into all matters incidental thereto, met this day in the Criminal Assize Courtroom in the Courthouse.

PRESENT:—HENRY HOLGATE, Esquire, C.E., Chairman;
JOHN G. G. KERRY, Esquire, C.E., and
JOHN GALBRAITH, Esquire, Professor of Engineering,
Commissioners.

The following counsel appeared before the commission:—

John Hampton Barnes, Esquire, Philadelphia, U.S.A., and G. G. Stuart, K.C., Quebec, representing the Phœnix Bridge Company.

Ferdinand Roy, Esquire, representing the Quebec Bridge Company, and

W. H. Davidson, Esquire, representing the International Association of Bridge Workers and the Bridge and Structural Iron Workers' Union.

In opening the inquiry Mr. Holgate said:—

As preliminary to the opening of proceedings in connection with the investigation into the collapse of the Quebec bridge, it is necessary to read the commission the authority under which this Royal Commission sits, so that I shall read the whole document. It is as follows:—

GREY.

(Seal)

CANADA.

EDWARD THE SEVENTH, *by the Grace of God, of the United Kingdom of Great Britain and Ireland, and of the British Dominions beyond the Seas, King, Defender of the Faith, Emperor of India.*

To all to whom these Presents shall come, or whom the same may in anywise concern,

GREETING:

Whereas, in and by an order of Our Governor General in Council, bearing date the thirty-first day of August, in the year of Our Lord One thousand nine hundred and seven, provision has been made for an investigation by Our Commissioners therein and hereinafter named into the cause of the collapse of the Quebec Bridge, in the course of construction over the St. Lawrence River, near the City of Quebec, in the Province of Quebec, on the twenty-ninth August, 1907, and into all matters incidental thereto.

Now know ye, that by and with the advice of Our Privy Council for Canada, We do by these Presents nominate, constitute and appoint:

Henry Holgate, of the City of Montreal, in the Province of Quebec, Civil Engineer, John G. G. Kerry, of Campbellford, in the Province of Ontario, Civil Engineer, and John Galbraith, of the City of Toronto, in the Province of Ontario, Dean of the Faculty of Applied Science and Engineering and Professor of Engineering in the University of Toronto, to be Our Commissioners to conduct such inquiry.

To have, hold, exercise and enjoy the said office, place and trust unto the said Henry Holgate, John G. G. Kerry and John Galbraith, together with the rights, powers, privileges and emoluments unto the said office, place and trust, of right and by law appertaining, during pleasure.

And we do hereby, under the authority of the Inquiries Act, Chapter 104 of the Revised Statutes, 1906, confer upon Our said Commissioners, the power of summoning before them any witnesses, and of requiring them to give evidence on oath, or on solemn affirmation if they are persons entitled to affirm in civil matters, and orally or in writing, and to produce such documents and things as Our said Commissioners shall deem requisite to the full investigation of the matters into which they are hereby appointed to examine.

And We do hereby require and direct Our said Commissioners to report to Our Governor General in Council the result of their investigation, together with the evidence taken before them, and any opinion they may see fit to express thereon.

In testimony whereof, We have caused these, Our letters to be made patent and the Great Seal of Canada to be hereunto affixed. Witness, Our Right Trusty and Right Well-beloved Cousin, The Right Honourable Sir Albert Henry George, Earl Grey, Viscount Howick, Baron Grey of Howick in the County of Northumberland, in the Peerage of the United Kingdom and a Baronet; Knight Grand Cross of Our Most Distinguished Order of Saint Michael and Saint George, &c., &c., Governor General and Commander in Chief of our Dominion of Canada.

At Our Government House, in Our City of Ottawa this thirty-first day of August in the Year of Our Lord, One thousand nine hundred and seven, and in the seventh Year of Our Reign.

By Command.

F. COLSON,
Acting Under-Secretary of State.

E. L. NEWCOMBE,
Deputy of the Minister of Justice, Canada.

Mr. HOLGATE continued:—This is essentially a commission of inquiry, and our sole purpose is to make the inquiry thorough. We must rely to a very large extent on the co-operation of everyone having definite knowledge as to actual occurrences and we would like to keep as close to that as possible. My fellow commissioners and myself would like all who have knowledge of the matter to give evidence. We may perhaps not be able to find everyone who could give evidence, but we would be very glad to have information that will lead us in that direction from whatever source it may be had. In the course of the examination of witnesses we would like to conduct the examination directly ourselves; but will be very glad of any suggestions that anyone in the room may have to offer, especially the legal gentlemen, so that during the course of the examination, if we are not successful in covering the point, which, in the opinion of others, should be covered, we want no hesitation on the part of these gentlemen in drawing our attention to that and we would be very glad to pursue that investigation as far as necessary.

Mr. JOHN HAMPTON BARNES.—Mr. Chairman, before you commence proceedings, I wish to state that I am general counsel of the Phœnix Bridge Company in Philadelphia, and I am here at the beginning of this inquiry, not purposing to remain here as occupying any legal professional relation particularly to this inquiry. So far as the legal relations of the company are concerned in this proceeding, they are represented by Mr. Stuart. I am here, sir, and I am moved to say what I am about to say by a remark you have just made, for the purpose of stating to the commission on behalf of the Bridge Company that it tenders its fullest and heartiest co-operation to the commission in the inquiry which is about to be made. It is our desire that the fullest investigation should be made and it is our purpose to forward that investigation to the utmost point. Next to the public interests, our interests are as great as any which can be involved in this inquiry. We will therefore, sir, be ready at all times to furnish to the commission on its request documents, records and plans which are not available by the exercise of your subpœna in this jurisdiction, and which are in our control and possession outside of this jurisdiction. We shall be subject to your directions in the production of the officers and representatives, agents and employees of the company who have knowledge of the facts which you are directed by your commission to inquire into. I feel, sir, that I need add no more to express the purpose my remarks are intended to cover.

Mr. HOLGATE.—Thank you very much, Mr. Barnes; I quite felt that that disposition would exist on the part of the Phœnix Bridge Company. I am sure that we will find that, from expressions we have heard, we will find them ready to give us that assistance. It will facilitate our work and expedite it.

Mr. W. H. DAVIDSON (Quebec).—I appear here at the request of the International Association of Bridge Workers, and the Bridge and Structural Iron Workers' Union on behalf of the victims and shall be very glad indeed to take advantage of the invitation which you have extended to the members of the bar here, to assist you in every way possible in this inquiry, and I just wish to add that I heard with a great deal of pleasure the words that have just fallen from the lips of the learned counsel of the Phœnix Bridge Company (Mr. Barnes).

Mr. HOLGATE.—If you can, in that capacity, assist in bringing before us clear evidence of fact it would certainly assist us very much.

Mr. DAVIDSON.—I can only state, sir, that any facts which are in my possession, will be, with a great deal of pleasure, placed at your disposal.

Mr. HOLGATE.—Thank you. You might submit to us the names of such witnesses as you think might be valuable in that respect.

Mr. DAVIDSON.—Certainly, sir.

Mr. ULRIC BARTHE, sworn.

Mr. HOLGATE.—You are secretary of the Quebec Bridge Company? What is the proper name of the company?

Mr. BARTHE.—I am secretary of the Quebec Bridge and Railway Company.

Mr. HOLGATE.—It is incorporated by a certain Act?

Mr. BARTHE.—I have prepared here a kind of collection of all the statutes and by-laws of the company, which will be more handy for the commissioners. (Statement put in and marked Exhibit 1.)

Mr. HOLGATE.—What do you call this—not by-laws?

Mr. BARTHE.—By-laws, statutes, and the general Railway Act which applies to the company.

Mr. HOLGATE.—What steps led to the commencement of the construction of this Quebec bridge, Mr. Barthe?

Mr. BARTHE.—Do you mean from the inception?

Mr. HOLGATE.—Yes, from its inception, in regard to its construction, I mean.

Mr. BARTHE.—It was after the company was reorganized in 1897, and after getting subsidies from the two governments at Ottawa and Quebec and the city of Quebec, and after having got $200,000 subscribed in stock, that tenders were called for the construction of the bridge in the year 1899.

Mr. HOLGATE.—Who were asked for these tenders

Mr. BARTHE.—The Quebec Bridge Company, which was its name at the time, called for tenders.

Mr. HOLGATE.—And you received tenders?

Mr. BARTHE.—Yes.

Mr. HOLGATE.—What was the next step?

Mr. BARTHE.—Then, after the tenders were reported on by the consulting engineer, Mr. Theodore Cooper, of New York, the contract was awarded, for the foundations, to Mr. M. P. Davis, and for the superstructure, to the Phœnix Bridge Company.

Mr. HOLGATE.—Were all the tenders submitted to Mr. Cooper?

Mr. BARTHE.—Yes, sir.

Mr. HOLGATE.—Were they submitted to anybody else?

Mr. BARTHE.—I do not know.

Mr. HOLGATE.—Then, was it upon Mr. Cooper's recommendation that the tender was accepted?

Mr. BARTHE.—Yes.

Mr. HOLGATE.—Which tender was accepted?

Mr. BARTHE.—As I said, for the foundation, that of Mr. M. P. Davis, and for the superstructure, that of the Phœnix Bridge Company.

Mr. HOLGATE.—I would like to know just the organization of the Quebec Bridge Company; give us your officers and what their duties are?

Mr. BARTHE.—I was not prepared to answer precisely that question this afternoon, but I put in the book there (referring to Exhibit 1) the list of the present officers as far as the head office is concerned, not concerning the engineers.

Mr. HOLGATE.—Is the engineer appointed by the board?

Mr. BARTHE.—Yes.

Mr. HOLGATE.—Who is the engineer?

Mr. BARTHE.—Mr. Hoare.

Mr. HOLGATE.—What is Mr. Hoare's title?

Mr. BARTHE.—He was always styled Chief Engineer; he was in fact the Chief Engineer.

Mr. HOLGATE.—His appointment then was by resolution of the board.

Mr. BARTHE.—Yes.

Mr. HOLGATE.—I would like to have a copy of that.

Mr. BARTHE.—It goes from the inception of the company, from the beginning of the company, before my time.

Mr. HOLGATE.—Mr. Hoare, you say, was appointed by the board of directors, so that it would be by resolution of the board?

Mr. BARTHE.—It should be.

Mr. HOLGATE.—That is what we would like to have so as to get his official appointment. I would like you to certify that the copy of that resolution is correct. And, we would like to have Mr. Hoare's duties defined, as understood by the board, if they were defined; will you let us have that to-morrow?

Mr. BARTHE.—Yes.

Mr. HOLGATE.—Were there other engineers appointed by the board besides Mr. Hoare?

Mr. BARTHE.—Mr. Theodore Cooper was appointed consulting engineer.

Mr. HOLGATE.—Is he responsible to the board?

Mr. BARTHE.—Yes—well, he was appointed by the board.

Mr. HOLGATE.—Is Mr. Hoare responsible only to the board?

Mr. BARTHE.—These are not questions which I would like to answer.

Mr. HOLGATE.—What are the relations between Mr. Cooper and Mr. Hoare?

Mr. BARTHE.—Mr. Cooper was appointed as consulting engineer. As to the exact distribution I cannot speak myself. It is a question of engineering. Mr. Hoare was appointed engineer to look after the whole work till completion.

Professor GALBRAITH.—There was no resolution giving either of these officials precedence in any way over the other as far as you know?

Mr. BARTHE.—I do not know any.

Mr. HOLGATE.—If there is anything of that nature existing, Mr. Barthe, would you look it up, and give us the corresponding information both in regard to Mr. Hoare and Mr. Cooper so as to show their relative positions?

Mr. BARTHE.—Yes.

Mr. HOLGATE.—Was there a contract existing with Mr. Cooper?

Mr. BARTHE.—There were letters exchanged which constitute a contract which was approved by the board.

Mr. HOLGATE.—Were they not brought into one document and made a contract of?

Mr. BARTHE.—No.

Mr. HOLGATE.—You might make a note also of that and let us have the letters.

Mr. BARTHE.—Yes.

Mr. HOLGATE.—Then, Mr. Cooper, you said, recommended the tender of the Phœnix Bridge Company and also the tender of Mr. Davis. What followed?

Mr. BARTHE.—The work was started.

Mr. HOLGATE.—Excuse me; what followed that? Was a contract drawn with the Phœnix Bridge Company?

Mr. BARTHE.—Yes.

Mr. HOLGATE.—I would like to see the contract.

Mr. BARTHE.—I have here a copy of the contract certified by myself. I might have produced the original but we want to keep it back after this is compared (copy of contract submitted).

Prof. GALBRAITH.—That is a certified copy?

Mr. BARTHE.—Here are the specifications (copy of specifications submitted).

Mr. HOLGATE.—That is not certified. We will not accept that.

Mr. BARTHE.—I will get another copy.

Mr. HOLGATE.—I would like if you would bring up the original contract.

Mr. BARTHE.—Well, I will bring it.

Mr. HOLGATE.—Are there specifications attached to the contract?

Mr. BARTHE.—They were not attached but they are referred to.

Mr. HOLGATE.—For the purpose of identification we must have also the original specifications—the specifications that formed part of the contract.

Mr. BARTHE.—That is in the Engineer's department.

Mr. HOLGATE.—Were not the specifications attached to the contract itself?

Mr. BARTHE.—There were no specifications attached to the contract.

Prof. GALBRAITH.—They were referred to in the contract?

Mr. BARTHE.—Yes.

Prof. GALBRAITH.—In that sense they were part of the contract?

Mr. BARTHE.—Yes, these are the specifications approved by the government engineer.

Mr. HOLGATE.—You have a copy of the specifications approved by the government engineer?

Mr. BARTHE.—We have that, but it is not in my department. I have to take these from the engineer's office.

Mr. HOLGATE.—Well, who has the official copy of the specifications?

Mr. BARTHE.—It ought to be in Mr. Hoare's office. He was governed by them.

Mr. HOLGATE.—And it is signed by the parties to the contract?

Mr. BARTHE.—I could not say. I have not seen them.

(Mr. Stuart handed in a memorandum to the commission.)

Prof. GALBRAITH.—In this last sentence you suggested that prior to the contract the plans were submitted to Mr. Cooper?

Mr. STUART.—My instructions are that the specifications were prepared and the tenders called for on the specifications before the contract was let by the Bridge Company; that they were approved before the contract was let at all.

Mr. BARTHE.—Yes, that is so.

Mr. STUART.—The succession of events is that the Bridge Company prepared specifications, upon them they called for tenders, tenders were sent in and these tenders were submitted to the engineers of the Quebec Bridge Company and approved by the engineers, Mr. Cooper and Mr. Hoare, I presume, and by the Governor in Council, before any contract was let.

Mr. BARTHE.—I wish that my deposition should be corrected in that sense. I was not as secretary—as I told you it was a question of engineering, and I had not much to do with it, but I remember now that the specifications were prepared, the tenders were called for on specifications prepared by the Quebec Bridge Company, specifications were approved by the Governor in Council.

Prof. GALBRAITH.—Any of these statements made there that you think you can swear to—(pointing to memorandum submitted by Mr. Stuart)?

Mr. BARTHE.—I do not know about this.

Prof. GALBRAITH.—You might indicate those you can swear to?

Mr. BARTHE.—And prior to a contract being awarded the plans were submitted to Mr. Cooper, and tenders were—that is, a contract was awarded on his report.

Mr. HOLGATE.—What about the order in council naming Mr. Cooper engineer on behalf of the government?

Mr. BARTHE.—I could not speak now without looking for it.

Prof. GALBRAITH.—Then we understand that Mr. Barthe says that the tenders were called for on specifications prepared by the Quebec Bridge Company? That is one statement you made?

Mr. BARTHE.—Yes.

Prof. GALBRAITH.—Then another statement is that the specifications were approved by the Governor in Council?

Mr. BARTHE.—That is the second one.

Prof. GALBRAITH.—That is another of your statements. And lastly, that prior to the contract the plans were submitted to Mr. Cooper?

Mr. BARTHE.—Yes.

Prof. GALBRAITH.—Now, what are we to understand by this other question, Mr. Stuart?

Mr. HOLGATE.—The specifications prepared by the Quebec Bridge and Railway Company?

Mr. STUART.—Yes, that is the specifications upon which the tenders were made. I think that ought to be produced. Of course that is the first step, and the foundation of the whole thing.

Prof. GALBRAITH.—We will ask you then to produce the specifications prepared by the Quebec Bridge Company. That is satisfactory, is it?

Mr. STUART.—Yes.

Mr. HOLGATE.—As well as of course the specifications under which the contract was made; also a copy of Mr. Cooper's report.

Mr. DAVIDSON.—I would like the commissioners to ask Mr. Barthe if he knows that to be an actual fact as stated in that note?

Mr. BARTHE.—What I have said, yes.

Prof. GALBRAITH.—He has said so.

Mr. DAVIDSON.—And were there any plans drawn, were there no plans made whatever? There is nothing mentioned about plans?

Prof. GALBRAITH.—We have not come to that yet, it is simply specifications.

Mr. DAVIDSON.—Oh, you have not come to plans yet.

Prof. GALBRAITH.—I think that with reference to your question referring to plans, in the course of the investigation we shall find it necessary to get into our possession at least all the plans that seem pertinent to the investigation, so I do not think it is worth while entering on that in the testimony of this witness.

Mr. DAVIDSON.—Very well, sir.

Mr. HOLGATE.—Mr. Barthe, when you make up that information you might include a copy of the circular letter that was issued inviting tenders for the construction of the bridge.

Mr. BARTHE.—I will do my best to get it.

Prof. GALBRAITH.—We simply wish a sworn statement in concise and clear language of the relations of the different parties to the contract and to the whole work, as short and clear as it can be made, the object being to have, I assume, a record which cannot be disputed as to the main relations between the parties.

Mr. HOLGATE.—Certainly.

Mr. ROY.—I am inquiring whether there would be sufficient time to have this by to-morrow because the president of the company, Mr. Parent, to my personal knowledge—and I think Mr. Barthe knows this as well—has had dealing with the engineers directly himself.

Mr. HOLGATE.—We will have the president of the company himself if necessary.

Mr. ROY.—About that statement, perhaps some facts occurred to Mr. Parent's knowledge, and not to Mr. Barthe's, so that it would not be completed by to-morrow.

Mr. STUART.—I would suggest that if Mr. Barthe prepares a statement of facts we could go over it all and satisfy ourselves after he has prepared it, and see if we can agree on a basis.

Mr. HOLGATE.—Why can you not do that?

Prof. GALBRAITH.—We can put you all on oath.

Mr. STUART.—If you like. I understood you to suggest that Mr. Barthe should prepare a statement; if he does that and submits it to Mr. Roy and myself, we would see whether we have anything to suggest or not.

Mr. HOLGATE.—It is simply a matter of history.

Mr. STUART.—That is all and it is all important to make that history absolutely accurate.

Mr. ROY.—My object was to make the statement as complete as possible and that is why I thought that there should be a little delay.

Mr. HOLGATE.—Is there any reason why we could not have that here to-morrow morning at 10 o'clock?

Mr. BARTHE.—I think myself it is rather short.

Mr. STUART.—We will try to have it to-morrow morning.

The Witness retired.

JOHN STERLING DEANS, sworn.

Mr. HOLGATE.—What is your official position?

Mr. DEANS.—Chief Engineer of the Phœnix Bridge Company.

Mr. HOLGATE.—In connection with the construction of the Quebec Bridge, would you let us have concisely a description of your organization?

Mr. DEANS.—Of the organization of the Phœnix Bridge Company?

Mr. HOLGATE.—Of the organization of the Phœnix Bridge Company with respect to the Quebec Bridge, with the names of those who have had to do with the work and their various duties or responsibilities, both in the preparation of preliminary work and designing, shop work and erection?

Mr. DEANS.—As chief engineer I have general supervision of the work of the Phœnix Bridge Company. Mr. P. L. Szlapka is the designing engineer of the company having charge of all the general designing which included the Quebec Bridge. Immediately under Mr. Szlapka is Mr. Charles Scheidal, engineer in charge detailing structure, and under Mr. Scheidal four or five assistant engineers and about 20 to 25 draughtsmen. That is the organization of the engineering office force. When you speak of shop work, it is a little hard to give that organization. I do not know exactly how you mean that.

Mr. HOLGATE.—You confine yourself there to such men as acted as inspectors of work in the shop?

Mr. DEANS.—Of course the shop work was constructed in accordance with plans and before it was shipped it was all passed upon by inspectors of the Quebec Bridge and Railway Company. Is that as much as you want about the shop?

Prof. GALBRAITH.—Have you inspectors of your own also?

Mr. DEANS.—The Phœnix Bridge Company have an inspector in our own shops.

Mr. HOLGATE.—And he would naturally inspect this material?

Mr. DEANS.—Inspect this material, and Mr. E. T. Morris——

Prof. KERRY.—Do I understand that the Phœnix Bridge Company itself constructed this material?

Mr. DEANS.—The Phœnix Iron Company of Phœnixville made all the shapes and all the smaller plates from their own open hearth steel. They bought the weightier plates from outside mills in Harrisburg and Pittsburg, but all of that material was fabricated into the complete members by the Phœnix Iron Company in Phœnixville.

Prof. KERRY.—There is a contract existing between the Iron Company and the Bridge Company?

Mr. DEANS.—Yes, there is a contract existing between the Iron Company and the Bridge Company.

Prof. KERRY.—Would that be with regard to the Quebec bridge in particular or to all work in general?

Mr. DEANS.—It is a general contract extending over a number of years beginning in 1884.

Prof. KERRY.—So that the terms of it would not be pertinent to this inquiry at all?

Mr. DEANS.—Would not be pertinent to this inquiry especially.

Prof. KERRY.—The eyebars were made where, Mr. Deans?

Mr. DEANS.—The eyebars, the material of the eyebars, was made in Harrisburg, Pa., and they were forged and tested in Phœnixville.

Mr. HOLGATE.—When your inspector goes over the material in the shop does he make it a practice for the Quebec Bridge Company inspectors to be with him, or is that inspection done independently?

Mr. DEANS.—Our inspector in the shop is inspector for all work passing through the shop. The Quebec bridge was simply an incident to his general inspection work. The Quebec bridge material was only passed as satisfactory and shipped on the inspection of the Quebec Bridge and Railway Company's inspector.

Mr. HOLGATE.—What is the name of the Quebec Bridge Company's inspector, of whom you spoke?

Mr. DEANS.—Mr. E. L. Edwards is the chief inspector, and Mr. Meeser is the assistant inspector; I do not remember his initials.

Prof. GALBRAITH.—For the Quebec Bridge Company?

Mr. DEANS.—For the Quebec Bridge Company.

Mr. HOLGATE.—They have been inspectors during the whole period of construction?

Mr. DEANS.—I think both of them have been for the entire period. I know Mr. Edwards has, the chief inspector.

Mr. HOLGATE.—Would it be possible for anything to be shipped without their inspection?

Mr. DEANS.—Absolutely not possible for anything to be shipped without their passing upon it and accepting it. Our shop discipline is such that nothing could be shipped without having been passed by the inspector of the party buying the bridge.

Prof. GALBRAITH.—Is this inspection made before or after the storage in your yards at Phœnixville?

Mr. DEANS.—The inspection is made before the storage in the yard at Phœnixville.

Mr. HOLGATE.—Then when the order is given by the Quebec Bridge Company's inspector to ship, the material is loaded by you and forwarded? When does it receive its next inspection?

Mr. DEANS.—The Quebec Bridge Company's inspector does not order the material shipped. It is shipped when we decide that it is needed for erection, but it is not shipped until they pass upon it and accept it at any time.

Prof. GALBRAITH.—But there is only one inspection made by them?

Mr. DEANS.—Only one inspection made by them at Phœnixville.

Prof. GALBRAITH.—Before the storage in the yard?

Mr. DEANS.—Before the storage in the yard.

Prof. GALBRAITH.—They do not reinspect on loading for transportation?

Mr. DEANS.—No, sir.

Prof. KERRY.—Is your general practice to store at Quebec or at Phœnixville?

Mr. DEANS.—The Quebec bridge covering such a large tonnage, a considerable portion of it has been stored at Phœnixville; at the same time the corresponding number was shipped to the south side and stored in our yard there near Chaudière.

Prof. KERRY.—You mean, for example, the member for the south and north truss would be made at the same time?

Mr. DEANS.—Would be made at the same time so as to agree exactly in the application of the templets.

Prof. KERRY.—One would be shipped to Chaudière and one would be stored at Phœnixville?

Mr. DEANS.—And is now being shipped to the Belair storage yard.

Mr. HOLGATE.—How would the inspector of the Quebec Bridge Company indicate he had passed these various pieces?

Mr. DEANS.—By a mark or notice to our inspector or to the shipper. I cannot say positively that he marked all the pieces; the usual practice is to mark every piece.

Mr. HOLGATE.—Do I understand then that there is a record of his passing each particular piece?

Mr. DEANS.—I believe the Quebec Bridge Company's representatives have a record of passing every piece of the Quebec bridge and the date it was passed?

Prof. GALBRAITH.—How is this mark made on the piece?

Mr. DEANS.—I do not remember exactly how the Quebec Company's mark is made. Some inspectors make a yellow mark and hit it with a hammer, and put their

initials on. I do not remember just exactly how they inspected it and marked it, but they have a private mark.

Mr. HOLGATE.—We can get that from Mr. Hoare.

Mr. DEANS.—You can get that from Mr. Hoare and also from the inspector.

Mr. HOLGATE.—Going back to the organization, would you now, Mr. Deans, follow the material along and describe the organization.

Mr. DEANS.—That is sufficient for the shop organization?

Mr. HOLGATE.—I think so.

Mr. DEANS.—The material then is shipped from Phœnixville and is received in the storage yard at Chaudière. There it comes in contact with the field organization of the Bridge Company. Mr. A. D. Milliken is superintendent of all our erection work and in that connection had a general supervision of the Quebec work. Immediately under him this year was Mr. D. A. Yenser, general foreman; Mr. John Worley, assistant foreman; Mr. James Aderholt, assistant foreman; Mr. Clark, assistant foreman; Mr. E. J Wickizer, assistant foreman, and the foreman of riveters, Mr. Matthews, I think. In addition, there were two engineers kept on the work, Mr. A. D. Birks, resident engineer of erection, and Mr. F. E. Cudworth, engineer in charge of field instrument work; Mr. W. W. Waitneight and Mr. A. D. Huot, time-keeper. Is that a sufficient number?

Mr. HOLGATE.—I think so. What were the relative responsibilities of the engineers in regard to the erection and superintendence? As I understand it, you have placed them in the descending scale?

Mr. DEANS.—Yes, I have placed them in the order, I think, of their responsibility. They have entirely different duties. Mr. Cudworth's duties were to see that the bridge was kept in its proper alignment vertically, horizontally and the elevation at pin centres. His duties were entirely field instrument work.

Prof. KERRY.—Did Mr. Cudworth report to you?

Mr. DEANS.—The organization was under the general foreman, Mr. Yenser.

Prof. KERRY.—Mr. Cudworth reported to Mr. Yanser?

Mr. DEANS.—Yes, but Mr. Cudworth had the authority to insist upon certain things being so as far as his engineering judgment called for it. Mr. Cudworth, having charge of the field instruments, could tell Mr. Yenser to put a pin point at a certain elevation and Mr. Yenser would follow his instructions.

Prof. GALBRAITH.—It was his duty to follow his instructions?

Mr. DEANS.—It was his duty to follow his instructions, although Mr. Yenser is the head, or the authority on this work.

Mr. HOLGATE.—That is that Mr. Cudworth was in a position to accurately check up Mr. Yenser.

Mr. DEANS.—That is it. You can see that the general foreman of erection could hardly pass upon an engineering matter and in that connection Mr. Cudworth's authority possibly exceeded the general foreman's—or Mr. Birks'.

Prof. GALBRAITH.—Mr. Birks also exceeded his authority in that same respect.

Mr. DEANS.—In that same respect. Do I make myself clear?

Prof. GALBRAITH.—I think so. In regard to all geometrical points, Mr. Cudworth and Mr. Birks had supreme authority?

Mr. DEANS.—Yes. Mr. Birks, in addition to that——

Mr. HOLGATE.—Who would you consider the responsible man in connection with the erection of the structure?

Mr. DEANS.—I consider that Mr. Yenser was.

Mr. HOLGATE.—Acting under advice.

Mr. DEANS.—Acting under advice from these engineers.

Prof. KERRY.—Then, the exact duties of Mr. Cudworth were to indicate the physical position in which the members were to be put?

Mr. DEANS.—He gave the lines, centres and elevations and kept each in that position.

Prof. KERRY.—That was the whole of his duty?

Mr. DEANS.—That was the whole of his duty.

Mr. HOLGATE.—Will you continue then, Mr. Deans, please?

Mr. DEANS.—Mr. Birks' authority was of the same kind; that is extended to the erectior features of the work; that is to see that all bolts were in position, all instructions of the office were carried out in connection with the handling of the members, the attaching of all the appliances. The traveller would not move forward until Mr. Birks said that everything was in accordance with the instructions received from the office regarding the condition of the work.

Mr. HOLGATE.—Will you be good enough to say how these instructions were given to Mr. Birks?

Mr. DEANS.—They were given to him by me—verbal, general instructions.

Mr, HOLGATE.—Are they indicated in any way on the erection diagrams?

Mr. DEANS.—I do not think they are indicated anywhere on the diagrams. Mr. Birks was placed on the work especially to see that all the minute instructions of the office in connection with the erection of the work, piece by piece, and the moving of the traveller ahead were carried out independent of the foreman.

Prof. GALBRAITH.—In whose hands were the instructions that you now speak of—the written instructions—finally placed?

Mr. DEANS.—These written instructions were placed in the hands——

Prof. GALBRAITH.—You might as well say from whom they went?

Mr. DEANS.—They were sent to Mr. Yenser from the office, and he handed a copy to each one of the under-foremen.

Prof. GALBRAITH.—He made copies of them?

Mr. DEANS.—They are blue prints. These instructions I speak of are blue prints in a small book supplied to the foremen in addition to the instructions which are especially put on the detailed plans which you will see.

Prof. KERRY.—They were sent to Mr. Yenser

Mr. DEANS.—A sufficient number of copies were sent to Mr. Yenser to furnish copies for all our foremen, assistant foremen, engineers and the chief engineer and representatives of the Quebec Bridge Company.

Mr. HOLGATE.—Would it be the ordinary course for him to give a copy of them to Mr. Birks?

Mr. DEANS.—I know that Mr. Birks had a copy personally.

Mr. HOLGATE.—From Mr. Yenser?

Mr. DEANS.—From Mr. Yenser.

Mr. HOLGATE.—And Mr. Birks had to see that Mr. Yenser carried them out?

Mr. DEANS.—Mr. Yenser would carry them out if nothing occurred, but we considered that it was necessary to have a special check from an engineering standpoint.

Mr. HOLGATE.—There were no special instructions to Mr. Birks to see that these instructions were carried out?

Mr. DEANS.—Our instructions were through the general foremen.

Prof. KERRY.—There were practically three responsible heads then, Mr. Deans: Mr. Yenser, the gentleman responsible for the erection and conduct of the work, Mr. Birks, responsible for the close inspection, to see that the company's instructions were carried out, and Mr. Cudworth, responsible for seeing that the members were put in their correct positions?

Mr. DEANS.—Yes, you might call it three responsibilities, all under Mr. Yenser, our general foreman.

Prof. KERRY.—Did such a thing as a conflict of authority between these different heads, or anything of that sort, ever arise; any difference as to the way a thing should be done?

Mr. DEANS.—Nothing that ever reached my ears in the Phœnixville office.

Prof. GALBRAITH.—Was the chance of such a conflict avoided by these officers having instructions from you that in case of a disagreement between them Mr.

Yenser had the final decision? Although this never occurred to your knowledge, was there any care taken to make it absolutely certain who had the authority in case of a disagreement?

Mr. DEANS.—It was made very clear to all concerned on the Quebec bridge that the final man in authority was Mr. Yenser, through the superintendent of erection, but I cannot imagine Mr. Yenser going contrary to the absolute instructions of either of the engineers.

Mr. HOLGATE.—We would like you to prepare a short memorandum, Mr. Deans, of the records of Mr. Yenser and of Mr. Birks.

Mr. DEANS.—Of their records?

Mr. HOLGATE.—Yes, indicating their experience, and your reasons for appointing them.

Mr. DEANS.—I will be very glad to do that, sir.

Mr. HOLGATE.—Mr. Cudworth can answer for himself.

Mr. DEANS.—He is here.

Prof. KERRY.—Were the selections in each case made by you personally, Mr. Deans?

Mr. DEANS.—The engineers were selected by me and the field men were selected by our superintendent of erection, Mr. Milliken, who always acted with respect to the principal men in conference with me.

Mr. GALBRAITH.—What was the relation between Mr. Milliken and Mr. Yenser with regard to the Quebec Bridge?

Mr. DEANS.—During the erection of the work Mr. Milliken spent a large portion of his time on the work and when he was present he was in supreme authority.

Mr. HOLGATE.—Was Mr. Yenser in the same position during the whole of the time on the portion that was being erected from the beginning of the work?

Mr. DEANS.—No, Mr. Yenser has been foreman—this will be the second year, but he was foreman in usual charge all the time he was on the Quebec work.

Mr. HOLGATE.—Was there any other foreman in charge of the erection of the work besides Mr. Yenser?

Mr. DEANS.—Mr. Shoemaker was in charge the first year during the erection of three panels of the lower chords, shoes and anchor span.

Mr. HOLGATE.—Is he still with you?

Mr. DEANS.—No, sir.

Prof. KERRY.—That would be the work of 1905?

Mr. DEANS.—The work of 1905.

Mr. HOLGATE.—And Mr. Yenser took the work up from there?

Mr. DEANS.—From there.

Mr. HOLGATE.—So that the chief charge of the work has been with Mr. Shoemaker and Mr. Yenser?

Mr. DEANS.—During the erection of the metal.

Mr. HOLGATE.—What about the engineers in the same way?

Mr. DEANS.—The same engineers have been on the work all the time.

Mr. HOLGATE.—No change has been made in the engineers?

Mr. DEANS.—No change has been made in the engineers.

Prof. GALBRAITH.—Either in the office or resident?

Mr. DEANS.—No.

Mr. HOLGATE.—I was referring only to the erection.

Mr. DEANS.—I supposed you meant only the erection. No change has been made in the erection engineers.

Prof. KERRY.—In cases of emergency the power to act lay either with Mr. Yenser or Mr. Milliken if he was there?

Mr. DEANS.—Finally.

Prof. KERRY.—They would be the men whose duty it would be to see what should be done?

Mr. DEANS.—Yes, that is right.

Prof. KERRY.—To what extent did they have any instructions from headquarters in connection with emergencies?

Mr. DEANS.—They had no special instructions to my recollection.

Prof. KERRY.—Their power was unlimited in case their judgment called for extraordinary action?

Mr. DEANS.—Yes, you may say their power was unlimited, but I should expect them to refer to the office if they had any serious question arise.

Mr. HOLGATE.—Were the instructions which were given through the erection plans to the foreman absolute?

Mr. DEANS.—The instructions on the plans and blue prints I referred to, could not be departed from without instructions from the office.

Mr. HOLGATE.—So that they were definite enough to entirely guide the erector?

Mr. DEANS.—They sufficed for the erection of nearly half the bridge.

Mr. HOLGATE.—Did he have to have these supplemented from time to time?

Mr. DEANS.—The only changes that I know of in these instructions were just slight changes of operation which we thought would save a little time or expense on the north side.

Prof. GALBPAITH.—By whom were these supplementary instructions given? Were they given from the office?

Mr. DEANS.—Suggestions reached us from Mr. Birks that on the north side we might make a little change but they were not carried out without our advice.

Mr. HOLGATE.—Did these suggestions arise from the experience they had gained on the south shore?

Mr. DEANS.—They were of very minor importance of themselves and arose from their experience in handling the work. They are all of very minor importance and are all noted on the print.

Mr. HOLGATE.—So that the bridge was erected from the detailed instructions issued from the Engineers' office at Phœnixville.

Mr. DEANS.—Yes, that is a fair statement of the fact. The instructions as to how the bridge should be erected were prepared in Phœnixville and carried out by the foreman in the field.

Prof. GALBRAITH.—And these alterations that you spoke of that were recorded on the instructions were from Phœnixville, were they?

Mr. DEANS.—No, they were from the field because they grew out of the experience in the field, reported in Phœnixville, and then incorporated on our blue prints for use on the north side.

Prof. GALBRAITH.—At Phœnixville?

Mr. DEANS.—At Phœnixville.

Prof. GALBRAITH.—Yes. The incorporation was done at Phœnixville and they were forwarded here?

Mr. DEANS.—When there were any changes made on the south side?

Prof. GALBRAITH.—Yes?

Mr. DEANS.—Yes, sir.

Mr. HOLGATE.—In connection with these instructions that would be issued in this way, Mr. Deans, was Mr. Milliken consulted?

Mr. DEANS.—Yes, sir—his department.

Mr. HOLGATE.—His department was consulted?

Mr. DEANS.—Yes, sir.

Mr. HOLGATE.—So that it was a committee of engineers that studied the matter and agreed on a certain method of erection?

Mr. DEANS.—Engineers and erectors—the erecting department.

Mr. HOLGATE.—Agreed upon a certain method of erection and then that method was set out on the blue print?

Mr. DEANS.—On the plans and blue prints.

Mr. HOLGATE.—And the erection foreman was governed by these instructions and no others?

Mr. DEANS.—Absolutely.

Mr. HOLGATE.—Is that your usual method of procedure in the office?

Mr. DEANS.—That is a very unusual method.

Mr. HOLGATE.—Adopted in this case, why?

Mr. DEANS.—It was adopted in this case as an extra safeguard against allowing the foreman to use his judgment in regard to the handling of material, and to fix that method by the best experience we had in our company.

Mr. HOLGATE.—Did you have to go outside of your own organization for consulting advice in this matter?

Mr. DEANS.—We did not. We had the benefit of all our plans being passed upon by Mr. Theodore Cooper for the Quebec Bridge Company.

Mr. HOLGATE.—Otherwise, your organization was, in your opinion, fully competent to deal with the matter?

Mr. DEANS.—We considered that we were fully competent to deal with the matter.

Mr. HOLGATE.—Then, as to your relations with Mr. Cooper, was it a continuous communication with him on these points?

Mr. DEANS.—Our relation with Mr. Cooper has been continuous since he was first appointed.

Mr. HOLGATE.—And were the plans that you worked to approved by Mr. Cooper?

Mr. DEANS.—All the plans that were worked to were approved by Mr. Cooper.

Prof. GALBRAITH.—Had Mr. Cooper any say in the matter of erection?

Mr. DEANS.—Mr. Cooper was particularly represented on the erection by Mr. McLure, an employee of the Quebec Bridge Company, who was selected to represent him in the field by Mr. Cooper.

Mr. HOLGATE.—Mr. Deans, would you just go back to those diagrams for the erection again? Are they approved by anybody outside of the Phœnix Bridge Company—the method of erection? You were just speaking of the detailed instructions?

Mr. DEANS.—No, they are not signed by anybody else.

Mr. HOLGATE.—They are simply instructions issued from the shop?

Mr. DEANS.—From the office.

Mr. HOLGATE.—From the office. They are not part of the set of plans of the bridge?

Mr. DEANS.—They were simply our instructions to carry out the work which was passed upon and approved by Mr. Cooper for the carrying out of the details of construction.

Mr. HOLGATE.—But these instructions were not put before the Quebec Bridge Company for approval?

Mr. DEANS.—No.

Prof. GALBRAITH.—And not before Mr. Cooper?

Mr. DEANS.—Not before Mr. Cooper.

Mr. HOLGATE.—So that the question of erection then was your own question?

Mr. DEANS.—That was our own question.

Prof. KERRY.—Are there any general written instructions, Mr. Deans, to the various officers? As I understand it, there are special blue print instructions stating how certain members shall be put up; are there in addition, general instructions to each of the senior officers with regard to the conduct of his work?

Mr. DEANS.—No, sir.

Prof. KERRY.—And what regular reports are there with regard to the progress of the work?

Mr. DEANS.—Every day we had a report from our general foreman giving the progress of the work.

Prof. KERRY.—And also reports from the engineers or just——

Mr. DEANS.—No, the reports came through the general foreman.

Prof. KERRY.—The report of the positions and the report of the inspection and the report of progress was in the daily report made by the general foreman, and that was the only report made to the office?

Mr. DEANS.—That is correct.

Prof. KERRY.—These reports are all on file, Mr. Deans, I presume?

Mr. DEANS.—Those reports are on file.

Mr. HOLGATE.—Are there copies here?

Mr. DEANS.—The copies must be here; the originals, of course, are in Phœnixville.

Mr. HOLGATE.—In whose charge are those copies?

Mr. DEANS.—In charge of Mr. Milliken, our superintendent of erection.

Mr. HOLGATE.—We think it would be an advantage to us to adjourn until to-morrow morning at 10 o'clock in order to give Mr. Barthe and Mr. Hoare together an opportunity to get that matter straightened up before we go any farther, and if Mr. Davidson will have that memorandum of those witnesses——

Mr. DAVIDSON.—I shall do my very best to have it for to-morrow morning.

Mr. HOLGATE.—If you could keep in mind what we said a while ago, that it is only men who can give evidence of fact——

Mr. DAVIDSON.—I do not presume to bring men here to express engineering opinions.

Mr. HOLGATE.—I do not mean that, but hearsay evidence or anything of the kind—

Mr. DAVIDSON.—Not at all.

Mr. HOLGATE.—We want to keep as close to the line of direct evidence as we can.

Mr. DAVIDSON.—I quite understand that, sir, and we will endeavour to do right.

The commission adjourned until 10 o'clock to-morrow (Tuesday) morning.

SECOND DAY.

QUEBEC, P.Q., September 10, 1907.

ULRIC BARTHE, Secretary Quebec Bridge Company, recalled.

Mr. HOLGATE.—Were you able to get all the information together?

Mr. BARTHE.—I regret to say not everything.

The witness retired.

JOHN STERLING DEANS, Chief Engineer, Phœnix Bridge Company, recalled.

Mr. HOLGATE.—Mr. Deans, who had power to dismiss Mr. Yenser or Mr. Cudworth, or Mr. Birks?

Mr. DEANS.—Mr. A. B. Milliken could have dismissed Mr. Yenser and could have requested the removal of Mr. Birks or Mr. Cudworth from me and his request would have been conceded.

Mr. HOLGATE.—There was no person on the bridge continually who could have exercised that power?

Mr. DEANS.—Naturally there would be nobody there continuously who could discharge Mr. Yenser, because he was in supreme authority.

Mr. HOLGATE.—But he could not have exercised that power with regard to the others?

Mr. DEANS.—He could have requested their removal from the Phœnixville office.

Mr. HOLGATE.—Have you got plans of the two travellers that were used?

Mr. DEANS.—They are in Quebec, in our office in Quebec at the bridge.

Mr. HOLGATE.—At the bridge? Will you please have them sent here?

Mr. DEANS.—Yes, sir, together with all erection plans.

Mr. HOLGATE.—Yes, together with all erection plans.

Mr. DEANS.—You asked yesterday about them.

Mr. HOLGATE.—And who is the proper party to explain those plans, would it be yourself?

Mr. DEANS.—I could explain the plans, yes.

Mr. HOLGATE.—Could Mr. Milliken?

Mr. DEANS.—Yes, sir.

Mr. HOLGATE.—I think you said yesterday that the construction plans were not submitted to Mr. Cooper?

Mr. DEANS.—The erection plans?

Mr. HOLGATE.—The erection plans.

Mr. DEANS.—I cannot say that they were not presented to Mr. Cooper, but they were not presented to him in the sense of getting his approval on every detail of them. If he had any comments to make he was in a position to make them.

Prof. GALBRAITH.—Oh, so that these erection blue prints were shown to Mr. Cooper for comments if he considered it necessary, while at the same time you were the supreme authority in deciding whether they were to be used or not. That is to say, Mr. Cooper could only advise; he had only advisory functions in connection with them. Is that the case?

Mr. DEANS.—I do not think that is a too strong statement of the facts; but further, Mr. Cooper, being in supreme authority, could have stopped or interfered with the erection through Mr. Hoare at any time that he saw fit.

Prof. GALBRAITH.—When you said yesterday that these plans were simply a part of the Phœnix Company's business, and that Mr. Cooper had no responsibility in connection therewith, you meant that to be simply in general; while at the same time, as you have said now, he could stop the work and stop anything that he pleased through Mr. Hoare?

Mr. DEANS.—Absolutely.

Prof. GALBRAITH.—That is the position?

Mr. DEANS.—That is the position.

Prof. KERRY.—Specifically, Mr. Deans, the plans of the travellers were regarded entirely as part of the erection plant, and did not require and did not have approval by anybody outside the Phœnix Bridge Company?

Mr. DEANS.—Nothing except a general approval; no signed documents, no signed papers.

Prof. GALBRAITH.—From Mr. Cooper?

Mr. DEANS.—From Mr. Cooper.

Prof. GALBRAITH.—The plans of the travellers were treated then just as all the other ordinary erection blue prints; they were not considered especially by Mr. Cooper?

Mr. DEANS.—No, the plans of the travellers were not considered especially by Mr. Cooper any more than any other feature of the erection or construction of the plant.

Prof. KERRY.—Was it the regular practice to submit all these plans bearing on the erection plant and the erection detail to Mr. Cooper?

Mr. DEANS.—Only in the sense of keeping him posted as to the general plan of our erection and procedure.

Prof. KERRY.—But in general, would all the plans appear before him or not, or would all the important plans appear before him?

Mr. DEANS.—I think Mr. Cooper saw all the important plans of erection.

Mr. HOLGATE.—Mr. Deans, were the erection blue prints simply detail working

plans of the general plan approved by Mr. Cooper, and contained nothing of plan or design not covered by the general plans?

Mr. DEANS.—In answering that question, the erection blue prints did not affect any plan or design covered by the approval of Mr. Cooper, either of the general plans or of the details.

Mr. HOLGATE.—What understanding had you, Mr. Deans, of the status of Mr. Hoare, first, and of Mr. Cooper in regard to the carrying out of the contract between the Quebec Bridge Company and the Phœnix Bridge Company?

Prof. GALBRAITH.—You mean Mr. Deans' personal interpretation of their functions?

Mr. HOLGATE.—Yes?

Mr. DEANS.—I understood that Mr. Cooper had supreme authority in connection with the interpretation of the specifications, had authority to change them from time to time as he saw fit, and had authority to approve all of our general and detailed plans.

Mr. HOLGATE.—Was that power exercised in regard to the approval of all?

Mr. DEANS.—That power was exercised by Mr. Cooper throughout the contract.

Mr. HOLGATE.—Were any plans used where that power of Mr. Cooper's was not exercised?

Mr. DEANS.—No plans were used where that power of approval of Mr. Cooper was not exercised.

Prof. KERRY.—The specifications formed part of the contract, Mr. Deans. Was your understanding that the power was vested in Mr. Cooper to alter these specifications?

Mr. DEANS.—Yes, sir, we had notice that Mr. Cooper had authority to alter those specifications; we also had notice that his authority and approval of plans would be considered final.

Prof. GALBRAITH.—In what form was his approval conveyed to you, in writing?

Mr. DEANS.—He had a rubber date stamp and he wrote on each drawing 'examined and approved by Theodore Cooper, Consulting Engineer, Quebec Bridge and Railway Company.'

Prof. GALBRAITH.—I think you said that you had notice from the company that Mr. Cooper had power to alter or amend the specifications.

Mr. DEANS.—We had.

Prof. GALBRAITH.—That would be in writing.

Mr. DEANS.—That was in writing and one of the papers which we asked Mr. Barthe to submit to you.

Prof. GALBRAITH.—You have the communications that passed?

Mr. DEANS.—We have the copy in Phœnixville.

Prof. GALBRAITH.—You could let us have that?

Mr. DEANS.—In addition to the originals?

Prof. GALBRAITH.—Oh, well, if it is identified here it is all the same.

Mr. DEANS.—We can let you have our copy.

Prof. KERRY.—The original would be quite sufficient. Also did you ask Mr. Barthe to produce the statement with regard to Mr. Cooper's authority; is that among the papers produced?

Mr. DEANS.—I do not think it was.

Mr. STUART.—I think that is in the Order in Council.

Mr. DEANS.—That Order in Council is the authority I referred to as the power to change the specification. He had the government order in council giving him authority to change the specification.

Mr. HOLGATE.—What is there to show that Mr. Cooper's power was final?

Mr. DEANS.—I think that paper of order in council would indicate that.

Prof. GALBRAITH.—In whose possession is that order in council?

Mr. DEANS.—It must be in Mr. Hoare's, or the Quebec Bridge and Railway Company's. We have a copy.

Prof. KERRY.—Mr. Deans, can you recall if Mr. Cooper at any time subsequent to the signing of the contract exercised his power to alter specifications?

Mr. DEANS.—He altered them in several, or in many instances.

Prof. KERRY.—Your understanding of the duties and powers of Mr. Cooper and Mr. Hoare, is entirely based on written documents?

Mr. DEANS.—I think my conclusions can all be shown by written documents.

Prof. KERRY.—That is the whole point.

Mr. DEANS.—I think so.

Mr. HOLGATE.—Now with regard to Mr. Hoare, Mr. Deans?

Mr. DEANS.—Regarding Mr. Hoare's authority?

Mr. HOLGATE.—Yes, sir, as you understood Mr. Hoare's position in relation to the contract.

Mr. DEANS.—Mr. Hoare being the chief engineer of the Quebec Bridge and Railway Company, I understood that I should look to him for any final instructions in connection with the contract in its execution.

Mr. HOLGATE.—Of what nature?

Mr. DEANS.—Well, I should say in all matters outside of the approval of plans and the interpretation of the specification and should look to him for final instructions in connection with the work in the field or shop.

Prof. GALBRAITH.—In other words, you assumed that he had the power to stop any piece of work?

Mr. DEANS.—That expresses it.

Prof. GALBRAITH.—To reject any piece of work.

Mr. DEANS.—That expresses it.

Prof. KERRY.—Or to express that in another way your understanding would be that with the exception of the preparation of the specifications and the approval of the detail plans that the entire final responsibility for the construction of the bridge lay with Mr. Hoare?

Mr. DEANS.—I do not think that is expressing it too broadly.

Prof. GALBRAITH.—Mr. Deans, if Mr. Cooper should have given instructions to stop the work at any stage what would you have considered it your duty to do?

Mr. DEANS.—I should have felt it incumbent to notify Mr. Hoare and receive his instructions.

Mr. HOLGATE.—Were changes in specifications made by Mr. Cooper communicated in writing, in duplicate and filed with both parties?

Mr. DEANS.—We receive a typewritten copy of the changes which he instructed us to make and I assume that a copy of these was left with Mr. Hoare.

Mr. HOLGATE.—You have your copy?

Mr. DEANS.—We have our copy in Phœnixville; if you cannot get the copy I will furnish you ours.

Mr. HOLGATE.—Yesterday we asked you for the records of Mr. Yenser and Mr. Birks.

Mr. DEANS.—Their professional records.

Mr. HOLGATE.—Their professional records; we would like you to give that just in your own way.

Mr. DEANS.—I think I had better read it because I will interline one or two things; it is just short. Mr. B. A. Yenser, general foreman, was about 38 years of age. Mr. Yenser had worked for several other bridge companies before entering the service of the Phœnix Bridge Company and he had been in the employ of the Phœnix Bridge Company for about 15 years. For about 10 years of this time he had acted as general foreman of erection, and he had charge of some of the most important structures built by the company, viz.: Elevated Railway, Brooklyn, N.Y.; Cambridge Bridge, Boston, Mass.; El Paso Bridge, Texas; Tennessee River Bridge, Tennessee; Susquehanna River Bridge, Towanda, &c.

Having shown unsual qualities as an erector, being extremely careful and conscientious, and having had large experience in the handling of men, he was selected for the Quebec work, where he had been in charge during the seasons of 1906 and 1907.

Mr. A. H. Birks, resident engineer of erection was about 28 years old. He was highly recommended to the company by Prof. George F. Swan, professor of civil engineering of the Massachusetts Institute of Technology, Boston, as one of his most promising graduates. He was a post-graduate of this institution. He entered the employ of the Phœnix Bridge Company about six years ago. His first duties were as a structural draughtsman. It was soon found that he was a man of unusual ability and high character and he was soon transferred to the erection department as assistant engineer. In this department, when the Quebec erection plans were taken up, he worked out many of the details of erection in connection with the heads of this department. He was at work on these plans and details about two and a half to three years; thus being familiar with all the department plans and details of erection, he was put on the Quebec work and worked in absolute harmony with the general foreman, and assistant foremen, having the confidence and respect of every man.

Mr. HOLGATE.—Then this was the first field work that Mr. Birks had undertaken?

Mr. DEANS.—No, Mr. Birks had been on several of our field erections before this.

Prof. KERRY.—Could you specify those, Mr. Deans?

Mr. DEANS.—I could not specify that off hand; I can get that later on and give it to you.

Prof. KERRY.—If you would, please.

Mr. DEANS.—I shall.

Mr. HOLGATE.—I wish you would give us an idea of how these men worked together on that bridge. What I mean is was there confidence mutually all around and did these men work in harmony?

Mr. DEANS.—We frequently commended on the very unusual harmony existing between the force on the Quebec Bridge. There was absolute harmony of action between the engineers, the foreman and assistant foremen. There was not a single bit of friction between them that has come to my knowledge since the work started and I believe that each had the other's confidence to the fullest extent.

Mr. HOLGATE.—Did that harmony extend also between themselves and the representatives of the Quebec Bridge Company on the ground?

Mr. DEANS.—I believe it extended through the entire force of the Quebec Bridge and Railway Company on the ground, their representatives there.

Prof. KERRY.—The situation would be, Mr. Deans, that Mr. Birks was practically a technical advisor to Mr. Yenser, in all matters involving purely technical knowledge.

Mr. DEANS.—Mr. Birks was an adviser to Mr. Yenser in technical matters, as far as they referred to the erection and the appliances for handling the erection.

Prof. GALBRAITH.—Mr. Birks gave no orders to foremen?

Mr. DEANS.—He gave no orders to anybody.

Prof. KERRY.—Mr. Yenser was what would be known as an erection man, in no way an engineer.

Mr. DEANS.—That is correct. I would like to add to my testimony of yesterday in two or three particulars. All of the material, after it was constructed in the shop and passed by the inspector, was marked 'the property of the Quebec Bridge and Railway Company,' by a stencil stamp, white leaded.

Prof. GALBRAITH.—That is that it was painted on.

Mr. DEANS.—A stencil and painted on.

Prof. GALBRAITH.—Not indented or stamped into the metal in any way.

Mr. DEANS.—No, not that. I was not familiar yesterday as to the inspector's stamp passing this material; you asked me that question?

Prof. GALBRAITH.—Yes.

Mr. DEANS.—I find that the inspector's stamp——

Prof. GALBRAITH.—Which inspector?

Mr. DEANS.—The Quebec Bridge Company's inspector. When he had examined the material and passed upon it, as correct and constructed in accordance with the plans and specifications at the shop, there was a white or yellow 'Q' painted on the metal and inside of this 'Q' a stencil stamp was indented in the metal marked 'Q-B' and every piece in the bridge passed and inspected had that 'Q-B' indented in it. It was 'Q-B' stamped on the end of a hammer and the inspector striking the metal a blow indented the stamp in the steel making it a mark that could not be removed.

You also asked me the question whether there was any inspection after the material had been examined and accepted at the shops before shipment. The contract provided that at any stage of construction inspection should take place, and in case of any injury to material in transit or handling that inspection would be exercised before the structure was put in the bridge. Yesterday I believe I said there was no further inspection.

Mr. HOLGATE.—Was the inspection as called for under the contract fully carried out?

Mr. DEANS.—As far as I know it was carried out in all respects.

Mr. HOLGATE.—There is nothing else you would like to add? You might say who if it is within your knowledge, made the inspection on the ground here?

Mr. DEANS.—I think the inspection on the ground here would have been made by Mr. Kinloch or Mr. McClure or Mr. E. A. Hoare.

Prof. GALBRAITH.—In general that inspection was made where, at the yard before the material was stored, before the storing took place, or also at the bridge?

Mr. DEANS.—The inspection would be made at any point where any changes were made in members after the members had been inspected and passed at the shops. In other words, if we altered a member in any particular after it was inspected and stamped we expected that it would have another inspection before we could put that member in place.

Mr. GALBRAITH.—Or if any accident happened or if any alteration occurred in any way?

Mr. DEANS.—If we altered it in any way after it was inspected and stamped at Phœnixville, we looked for and asked for an inspection before we put that member in place.

Mr. HOLGATE.—Was it to your interest to have inspections made as often and as thoroughly as possible?

Mr. DEANS.—Certainly.

Prof. KERRY.—In general you had two regular inspections, one at the shop, and one on the bridge just before the material was erected, did you not?

Mr. DEANS.—I do not wish to convey a wrong impression. There were no two general inspections. Of course, if the inspectors here would notice anything that was overlooked in the shop they would call our attention to it, but I wish it understood that if any member, once passed and stamped at Phœnixville, was altered in any particular by us we asked for and expected another inspection before we put it in the work.

Prof. KERRY.—There was no regular, systematic re-inspection of material before it went into place?

Mr. DEANS.—Not as I understand it.

Prof. GALBRAITH.—You said yesterday, I think, that there were parts of the structure not rolled in the Phœnixville mills that you obtained from Pittsburg and Harrisburg, that these portions were larger portions than you could manufacture in your own shops?

Mr. DEANS.—In plates?

Mr. GALBRAITH.—In plates. Had you, or had the Quebec Bridge Company,

inspectors who examined these plates during the process of construction, or at any time before they were delivered to you at Phœnixville?

Mr. DEANS.—All the material manufactured at outside mills was tested, examined and passed by an inspector of the Quebec Bridge Company before it was shipped to Phœnixville and fabricated.

Prof. GALBRAITH.—If there are any points which you think we have missed and wish to bring out, it might be as well for you to do so—in this connection?

Mr. DEANS.—I thought over it last evening and the three I mentioned were the only three I thought of at the time.

Prof. KERRY.—Was there any regular inspection at or near the bridge previous to the erection of all members by the officers of the Phœnix Bridge Company?

Mr. DEANS.—They exercised a careful inspection of the work at the bridge and in the yards.

Prof. KERRY.—A systematic inspection?

Mr. DEANS.—A systematic inspection as each member was passed out to the bridge to see that it was all right?

Prof. GALBRAITH.—Could you describe the nature of the inspection? Was it visual entirely, or did they use tools, or put lines on the material, or anything of that kind? Could you give any idea of the nature of the inspection?

Mr. DEANS.—The nature of the inspection was a careful examination of each member at the time it was being prepared for erection and appliances attached for handling the same.

Prof. GALBRAITH.—Was there anything other than a purely examining by eye? Was there anything done by the hand or anything of that kind? Perhaps I can get this information better from another witness.

Mr. DEANS.—Possibly.

Mr. HOLGATE.—Who would that be, Mr. Deans?

Mr. DEANS.—I think possibly Mr. Kinloch or Mr. McLure of the Quebec Bridge Company. Our own men that did that work, you know, were lost in the disaster. Mr. A. B. Milliken might be able to give you the information.

Mr. HOLGATE.—In the carrying out of the inspection that you have just been describing, if any error or defect were found, whose duty would it be to report it and to whom would the report be sent?

Mr. DEANS.—It would be the duty of anybody who noticed any defect to report it and it would be reported to Mr. Yenser.

Prof. GALBRAITH.—Mr. Kerry says that he really means who were the individual inspectors who reported these things.

Mr. DEANS.—Any defect in any member in the yards or previous to erection would have been more likely to have been found by Mr. Birks as he was the one to see that the member with all its attachments was in proper shape to be erected and he would have reported any defect to Mr. Yenser.

Prof. KERRY.—In case of defects developing on the bridge that were not observed previous to erection was there any systematic inspection of the members that had already been erected from time to time?

Mr. DEANS.—I should say that the inspection was systematic to the extent that all of the bridge was under close observation all the time.

Prof. KERRY.—More particularly from Mr. Yenser and Mr. Birks?

Mr. DEANS.—From our side more particularly by Mr. Birks and Mr. Yenser.

Prof. GALBRAITH.—Was Mr. Milliken much on the bridge?

Mr. DEANS.—He was on the bridge the greater part of the time during the construction season.

Mr. HOLGATE.—I think you said, Mr. Deans, that defects found would be reported to Mr. Yenser?

Mr. DEANS.—Yes, sir.

Mr. HOLGATE.—Would he then act on his own discretion or would he ask for advice from the head office in Phœnixville?

Mr. DEANS.—In minor matters he would act on his own responsibility in connection with Mr. Birks and his other assistants.

Prof. GALBRAITH.—That is to say, that he would confer with them before deciding?

Mr. DEANS.—He would confer with them before deciding.

Mr. HOLGATE.—As to whether it was a minor or greater matter would be left to Mr. Yenser's discretion?

Mr. DEANS.—I should not say that altogether. It would be decided at the conference between Mr. Yenser and the engineers and as they worked in entire harmony it would be the general conclusion of all.

Mr. HOLGATE.—That is what I mean, represented by Mr. Yenser who was in charge.

Mr. DEANS.—That is right.

Mr. HOLGATE.—It is not likely that Mr. Yenser would, on his own responsibility, decide without conference with Mr. Birks?

Mr. DEANS.—Not at all; it was not possible.

Mr. HOLGATE.—In any question of that nature that arose between Mr. Yenser and Mr. Birks where they had discussions in matters of that kind would they include such in their periodical reports to the office?

Mr. DEANS.—Anything they had considered important.

Prof. KERRY.—Do you mean, Mr. Deans, that they would come to a decision and that they would then report to the office that such circumstances had arisen and that they had decided to act in such a way?

Mr. DEANS.—I feel that we had a complete report of that kind.

Witness retired.

FRANK CUDWORTH sworn.

Witness retired.

A. B. MILLIKEN, sworn.

Mr. HOLGATE.—Mr. Milliken, will you please describe your position and your duties?

Mr. MILLIKEN.—My position is superintendent of erection—general erection. My duties, in a general way, are to appoint foremen and arrange for the different forces in the different parts of the country for our work.

Mr. HOLGATE.—Have you charge of the erection of all the Phœnix Bridge Company's works?

Mr. MILLIKEN—Yes, in the United States and Canada.

Mr. HOLGATE.—How long have you occupied that position?

Mr. MILLIKEN.—Seventeen years.

Mr. HOLGATE.—By whom were you appointed?

Mr. MILLIKEN.—By our chief engineer, Mr. Deans.

Mr. HOLGATE.—Are your instructions in writing from the company?

Mr. MILLIKEN.—Well, sometimes they are; yes, sir.

Mr. HOLGATE.—General instructions, I mean, of appointment?

Mr. MILLIKEN.—Not as a rule. Oh, of appointment?

Prof. GALBRAITH.—The general instructions of appointment—are they printed or in writing?

Mr. MILLIKEN.—It was in writing.

Mr. HOLGATE.—To whom are you responsible?

Mr. MILLIKEN.—To Mr. Deans.

Mr. HOLGATE.—To what extent is that responsibility?

Mr. MILLIKEN.—I report directly to him and take instructions from him.

Mr. HOLGATE.—What other works, besides the Quebec bridge, have you had under your charge since the commencement of the construction of the Quebec bridge?

Mr. MILLIKEN.—I could not enumerate them just now, but I can give them to you. There is a very great number of them.

Mr. HOLGATE.—Just name some of them.

Mr. MILLIKEN.—There are bridges for the Southern Railway and the Lehigh Valley Railway.

Mr. HOLGATE.—Just mention the different ones.

Mr. MILLIKEN.—The Cambridge bridge at Boston. The Tennessee River bridge in Tennessee, the bridge crosses the Susquehanna river for the Lehigh Valley railway in Pennsylvania.

Mr. HOLGATE.—Do I understand that these were all going on at the same time as the Quebec bridge construction?

Mr. MILLIKEN.—Yes, and a great many more, not so large as that, ' ough.

Mr. HOLGATE.—Prior to the construction of the Quebec bridge what large works had you in hand as superintendent?

Mr. MILLIKEN.—The Pecos viaduct in Texas, the Missouri river bridge at Omaha, and the Missouri river bridge at Sioux city, Iowa.

Prof. KERRY.—It would be well to say which bridge in each case.

Prof. GALBRAITH.—Specify the bridge if there is more than one.

Prof. KERRY.—There is more than one Missouri river bridge at Omaha, for example.

Mr. MILLIKEN.—I do not remember the name of the road but I know what the spans consist of—two 500 fixed spans and two 490 feet draw spans. The bridge at Omaha was a 520 foot double track draw bridge. The bridge at Towanda, Pa., consisted of 14 spans, double track, 130 foot deck plate girders. The Pecos viaduct consisted of the viaduct with cantilever spans in the centre of it 328 feet high. The Cambridge bridge consisted of 8 or 9 arch spans; the dimensions I do not remember. The Tennessee river bridge at Lowden, Tenn., consisted of eight 150 foot spans or 300 foot spans. A great many of these structures of course, were renewal and maintained traffic.

Mr. HOLGATE.—You mention that some of them were renewal,—why?

Mr. MILLIKEN.—I mention the maintaining of traffic because we had to take care of all trains, both passenger and freight, with safe passage during erection or renewal. There is also the bridge for the Grand Trunk railway at Belœil. I forgot two very large structures, one for the United States government crossing the Mississippi river at Rock Island; also another one across the same river about a mile below this government bridge, both of them very large structures, on one of which, a double decked bridge, we had to maintain both roadway and railway traffic.

Mr. HOLGATE.—What is the largest work on the cantilever principle that you have had charge of?

Mr. MILLIKEN.—That was at Needles, California, across the Colorado river.

Mr. HOLGATE.—You might describe that briefly.

Mr. MILLIKEN.—That was erected in 1889-1890. I do not remember the length of the span.

Prof. GALBRAITH.—What river did it cross?

Mr. MILLIKEN.—Across the Colorado river at Needles, California.

Prof. GALBRAITH.—It would be quite a large span.

Mr. MILLIKEN.—Yes

Prof. GALBRAITH.—500 or 600 feet?

Mr. MILLIKEN.—More than that.

Prof. GALBRAITH.—Was it?

Mr. MILLIKEN.—It was about a 600 or 700 foot span, I should say, between the main piers.

Mr. HOLGATE.—A railway bridge?

Mr. MILLIKEN.—Yes.

Mr. HOLGATE.—Single or double track?

Mr. MILLIKEN.—Single track.

Mr. HOLGATE.—Mr. Deans just handed me a memorandum that the span you speak of is 660 feet. Would that be about what your recollection is?

Mr. MILLIKEN.—Yes, sir. I said 600 or 700 feet.

Mr. HOLGATE.—Well, Mr. Milliken, do you consider yourself essentially an erection man?

Mr. MILLIKEN.—Yes, sir.

Mr. HOLGATE.—Do you class yourself as an erection man or as an engineer?

Mr. MILLIKEN.—As an erection man.

Mr. HOLGATE.—In regard to your duties in connection with the Quebec bridge, we would like to know what personal attention you gave to the work.

Mr. MILLIKEN.—In the seasons of 1905 and 1906——

Mr. HOLGATE.—First of all, when was erection commenced?

Mr. MILLIKEN.—Actual erection?

Mr. HOLGATE.—Yes, sir.

Mr. MILLIKEN.—As I remember, June 23, 1905.

Mr. HOLGATE.—Now, then, go on.

Prof. GALBRAITH.—June, 1905?

Mr. MILLIKEN.—I am not sure about that.

Prof. GALBRAITH.—Roughly?

Mr. MILLIKEN.—July, 1905.

Prof. GALBRAITH.—That is the erection?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—The local preparation for erection commenced when?

Mr. MILLIKEN.—In the field?

Prof. KERRY.—Yes, at Quebec?

Mr. MILLIKEN.—It commenced in 1904 or the latter part of 1903.

Prof. GALBRAITH.—You mean the erection of false works?

Mr. MILLIKEN.—Yes, sir, getting in material and starting the erection of false work.

Prof. GALBRAITH.—1903?

Mr. MILLIKEN.—1904 is the first we started the erection of false work.

Prof. GALBRAITH.—1905 is when you started the bridge?

Mr. MILLIKEN.—Yes, sir, that is when we started the permanent structure.

Prof. GALBRAITH.—The false work in 1904, you say?

Mr. MILLIKEN.—Yes.

Mr. HOLGATE.—Now, that question of mine comes in: In regard to your duties in connection with the Quebec bridge, we would like to know what personal attention you gave to the work.

Mr. MILLIKEN.—In 1905 I was here most of the season after actual erection started and in 1906 I was here at least 80 per cent of the working season. In 1907 I was here about 50 per cent of the working season.

Mr. HOLGATE.—Do you keep a diary?

Mr. MILLIKEN.—No, sir.

Mr. HOLGATE.—When you were on the ground here did you assume any direct control of the work?

Mr. MILLIKEN.—Nothing except in a general way. When I was on the ground, if it was necessary to refer anything to me by our general foreman in charge, of course, he would do it.

Mr. HOLGATE.—Was your position then advisory only or was it executive?

Mr. MILLIKEN.—Unless something came up out of the general line of our erection, which, of course, had been laid out, the general run of the work. If anything unusual would arise he would probably refer it to me and confer with me.

Mr. HOLGATE.—And did confer?

Mr. MILLIKEN.—Yes, a number of times—not very often.

Mr. HOLGATE.—You refer now to matters in general, such as the inspection of the material that was to be erected and also to the method of its handling and placing in the bridge?

Mr. MILLIKEN.—Yes, sir; not to the inspection of the permanent material, but the inspection of our erection plant, travellers, &c. That was particularly looked after—constantly. But the material for the permanent structure we assumed to be all right when it arrived here for erection.

Prof. GALBRAITH.—To bring out Mr. Holgate's point more clearly, I think that his question refers more particularly to any orders or instructions in regard to the work that might be issued rather than to a conference which consisted simply in your being informed of the general state of the work at the time you arrived when you came from a distance, or an ordinary consultation. The particular point is, I think, this: Did you issue orders to Mr. Yenser, or did you, simply, every time there was any difference of opinion, come to an agreement with him? What was your process of working?

Mr. MILLIKEN.—Mr. Yenser would pursue the general course of the work whether I was absent or whether I was present. If there was anything that would arise during my presence here he would confer with me—anything out of the regular way.

Prof. KERRY.—In general you had created a local working organization which was responsible to you for the performance of its duties, but as long as everything was going smoothly you simply went on and let it work?

Mr. MILLIKEN.—Yes, sir; that is it; that is it exactly.

Mr. HOLGATE.—In deciding upon the method of the erection of this bridge, were you consulted by the head office?

Mr. MILLIKEN.—Yes.

Mr. HOLGATE.—You might just tell the process that was made use of in arriving at the determination of the method of the erection of the bridge.

Mr. MILLIKEN.—In my department there are a great many of the appliances. The plans were prepared in my department at Phœnixville and when they were fully prepared and what we consider ready for use they were referred to the computing department, which is directly under our designing engineer, Mr. Szlapka. When they had had a thorough check in my department and when the engineers thought it was all right, it was referred up there and rechecked, and if it was satisfactory it would go through. If not, any change that was recommended would have to be made.

Mr. HOLGATE.—Who finally had the approval of the erection methods?

Mr. MILLIKEN.—Mr. Szlapka—not the methods.

Mr. HOLGATE.—The methods I mean?

Mr. MILLIKEN.—The methods of the erection of the main structure was divided between Mr. Szlapka's department and my department; that is as to the actual workmanship and handling of the materials. We felt that was necessary on account of making detail drawings for the bridge. They often referred to my department and asked whether they could be handled all right in the field with safety. Then, that was discussed and determined. Of course, many details of that kind occurred during the preparation of the plans for the main structure.

Prof. GALBRAITH.—I think the questions are with reference simply to whether the arrangements that you made for erection were left altogether in your department or divided between you and Mr. Szlapka's department. I do not think that the question refers to a consultation between Mr. Szlapka's department having reference to the design of the parts of the structure and your department, or the consultations that they had with you as to whether they could be handled or not. I do not think that is what was meant; I think the question is, whether the work that we are now asking about was sometimes divided between you and Mr. Szlapka.

Mr. MILLIKEN.—No, that was in my department entirely.

Prof. GALBRAITH.—You said you had to send your designs for computation sometimes to Mr. Szlapka's department?

Mr. MILLIKEN.—Yes, as a matter of safety, particularly on this job, everything that was prepared, the appliances and everything of that kind in my department, were sent to Mr. Szlapka's department and checked.

Mr. HOLGATE.—Was that your ordinary procedure in cases of that kind?

Mr. MILLIKEN.—No, sir, only on this work.

Mr. HOLGATE.—Was it resorted to in connection with any other work?

Mr. MILLIKEN.—No, sir, it never has been, to my knowledge, except on the Quebec work?

Mr. HOLGATE.—For what reason?

Mr. MILLIKEN.—Well, on account of its great magnitude and the character of the work, which had never been done before, we were anxious to take every possible precaution and safety that were known to anybody.

Mr. HOLGATE.—What system of reports on this particular work had you, Mr. Milliken? I mean the reports that were sent to you, or the reports that you made to Mr. Deans?

Mr. MILLIKEN.—On account of my absence I never interfered with the regular course of reporting. Mr. Yenser made his reports daily, and we had some printed forms.

Mr. HOLGATE.—Where did Mr. Yenser's reports go?

Mr. MILLIKEN.—They went to Phœnixville, addressed to the Phœnix Bridge Company. We have some regular forms for reporting the number of rivets driven per day, and our car reports which were made up by the clerks in the office and simply signed by Mr. Yenser.

Mr. HOLGATE.—Could you give us a few samples of these reports that were made by Mr. Yenser?

Mr. MILLIKEN.—We have them at the bridge.

Mr. HOLGATE.—Are all the reports regarding the erection at the bridge now, or copies of them?

Mr. MILLIKEN.—Yes, sir. Mr. Cudworth, as resident engineer, made reports. Of course, he made these up himself on blue print diagrams which he had prepared in his certain way.

Prof. GALBRAITH.—This request has nothing to do with any particular incident on the bridge. At the present time we are only looking into the general system. A specimen of each report will do for the present.

Mr. MILLIKEN.—All right.

Mr. KERRY.—Mr. Milliken, will you tell us, as well as you can, the general system of handling the work that Mr. Yenser had with regard to reports, &c., that came in to him. We want to get an idea of the working organization he had under him, the character of the work, and with whom he would deal if he wanted any details of the work executed.

Mr. MILLIKEN.—Outside of the regular course?

Prof. KERRY.—It is the regular course we want to get more particularly, not anything out of the regular course, but the regular course itself.

Mr. MILLIKEN.—The regular course of the prosecution of the work would be for him to confer with or rather issue instructions to his assistant foreman, to Mr. Birks or Mr. Cudworth. The entire work was under his general direction.

Prof. KERRY.—He was constantly on the work?

Mr. MILLIKEN.—Constantly on the work, yes, sir.

Prof. KERRY.—And his reports from his assistant foremen would be written or verbal mostly?

Mr. MILLIKEN.—Verbal; he was among his men all the time; while I was present on the work he was right among them, constantly. It has occurred that he did not take time to come in and sign his letters, devoting his entire attention to the actual work of erection.

Prof. KERRY.—His general method would be simply to issue his instructions direct to his assistant foremen?

Mr. MILLIKEN.—Yes, sir, verbally.

Prof. KERRY.—And observe their carrying out?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—Now, with regard to Mr. Birks, his detailed duties practically consist of what?

Mr. MILLIKEN.—Mr. Birks' duties consisted of keeping a close watch on erection to see that the members had been properly assembled and bolted up.

Prof. KERRY.—He would inspect the members before they were erected?

Mr. MILLIKEN.—He would inspect the attachments on the members. When a section of the main structure would come to the bridge for erection, we of course assumed that the member was all right, but the attachments for to put that member in place in the bridge, in its permanent position in the bridge, the attachments for that member was examined by Mr. Birks; that was one of his duties.

Prof. KERRY.—Then it was assumed that after a member left Phœnixville, unless some accident happened to it, it was perfect in every structural detail?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—As far as the member itself was concerned?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—That was accepted and Mr. Birks' duties consisted in seeing that it was properly erected, and all the attachments added to it were properly put on.

Mr. MILLIKEN.—Yes, sir, to see that the proper attachments according to our drawing was put on the member, and that it had its proper number of bolts on, and even after it got out on the bridge he would watch to see that the proper attachment for attaching our falls to it were all right. In other words, when they were ready to go ahead he would look it over and say: All right, go ahead.

Prof. KERRY.—His duties might be fairly described as an inspector of erection?

Mr. MILLIKEN.—Well, yes, sir, engineer and inspector of erection.

Prof. KERRY.—Did he have any specific duties with regard to the inspection of the structure as a whole? What I mean is, would his attention be more particularly directed all the time to the part that was being worked on, or had he any specific instructions to observe the entire structure, the parts already finished?

Mr. MILLIKEN.—He had no specific instructions to make any particular observations in that respect, at least not from my department.

Prof. GALBRAITH.—Whose duty was it to make the daily examination of lines and levels in the bridge as a whole or was there any such?

Mr. MILLIKEN.—Well, Mr. Cudworth was engineer in charge of the instrument work, and that was arranged for at different periods of the construction of the bridge, and at that particular period when that work was to be done, Mr. Cudworth was in charge of that part of the instrument work.

Prof. KERRY.—What system of record of progress existed, Mr. Milliken?

Mr. MILLIKEN.—Of erection?

Prof. KERRY.—What system of record of erection, how closely—for example a member is being put up or a joint is being completed, how closely was that progress recorded and what was the system?

Mr. MILLIKEN.—Sometimes we would have a general drawing laid before us and we would report to Phœnixville the particular members erected up to the time we made the report.

Prof. KERRY.—Each day?

Mr. MILLIKEN.—Each day.

Prof. KERRY.—Each day all the members put up in the last 24 hours were reported to Phœnixville?

Mr. MILLIKEN.—Yes, sir, and at Phœnixville they had their general drawings, the general plan of the bridge and they would mark on that plan with a lead pencil showing

just the progress we were making. They had it before them all the time on this general plan.

Prof. GALBRAITH.—Were these reports the reports referred to some time ago, as Mr. Yenser's reports?

Mr. MILLIKEN.—This marking up of our progress at Phœnixville would be taken from Mr. Yenser's report from day to day.

Prof. GALBRAITH.—Mr. Birks did not send an independent report or Mr. Cudworth?

Mr. MILLIKEN.—Mr. Birks made no independent reports; his report sometimes would be incorporated in Mr. Yenser's as the report of some particular matters, though that Mr. Birks had made reports. If there was any minor change that we thought better or suggested for the north side to simplify the erection why he would make that report.

Prof. KERRY.—Now, with regard to the connections there would be a large number of minor parts, fastenings, &c., which are not capable of direct identification, number or anything of that sort. What record is kept of their being put in place?

Mr. MILLIKEN.—Well, we had a detailed numbering of everything of all these attachments, every single one that was used in the bridge, and each attachment had its respective mark, and in failure to distinguish that mark Mr. Birks would always refer to his detailed plan, covering that particular attachment.

Prof. KERRY.—Perhaps I might illustrate there, Mr. Milliken. You have, for instance, one of the main pins. Then you have a little bolt running down the centre of the main pin, with what I might call covering plates at the end; for instance it might be reported that the pin itself would be in place but the little bolt inside might not be in place at the time of the report; would there be any system of report that would cover a detail like that?

Mr. MILLIKEN.—Whether he had that particular rod and those saucers or washers on the end——

Prof. KERRY.—In place, yes?

Mr. MILLIKEN.—Well, I cannot say that his report would cover that fully in detail, but to carry out the instructions, which we did, he would put that rod and those saucers in there just as soon as the pin had been driven through the bars.

Prof. GALBRAITH.—That is to say a piece of work like that would not be left to the next day?

Mr. MILLIKEN.—No, sir, that belonged to that connection and we had that right on the same car with that particular part.

Prof. GALBRAITH.—And the joint was completely finished, all the parts were assembled on it?

Mr. MILLIKEN.—Yes, sir; yes, sir; yes, sir.

Prof. GALBRAITH.—About the assembling of one of those tension joints, how long would the assembling and completion, the bolting up take?

Mr. MILLIKEN.—The driving of the pin in the permanent structure?

Prof. GALBRAITH.—Yes, the completion of that joint from beginning to end? How long a time for any particular joint after the pieces were laid, from the time of driving the bolt until the joint was completed?

Mr. MILLIKEN.—I think some of them would be made in 20 minutes.

Prof. GALBRAITH.—I just wanted to get an idea.

Mr. MILLIKEN.—The maximum time, as far as I know, is about an hour or an hour and a quarter.

Prof. KERRY.—How closely was the progress of riveting reported?

Mr. MILLIKEN.—Daily.

Prof. KERRY.—In what form?

Mr. MILLIKEN.—On a printed form which we have.

Prof. KERRY.—Showing exactly each rivet as driven?

Mr. MILLIKEN.—Showing the number of rivets driven, and our general book of

instructions designated what points we were to rivet, so that it was only necessary for us to report the daily number of rivets driven by the gangs.

Mr. HOLGATE.—The book of instructions? That is the first time we have heard that expression. You might just explain what that is.

Mr. MILLIKEN.—Well, it is a small book and pages were added to it, made up by Mr. Scheidal, the engineer in charge of the work, and this book comprised probably 50 or 60 pages, and was made up just as the work was completed in his office; he would follow with a page of instructions to us, and send it on to us and we would add it to this book.

Prof. KERRY.—Would there be any record that would show, is the system so close that if the office had been asked at a certain date what portions of the structure were riveted up, how closely could they have answered the question?

Mr. MILLIKEN.—Well, we could have answered it exactly, just what they had, the actual condition of the work.

Prof. KERRY.—That is to say the riveting gangs had absolute instructions as to the order in which rivets were to be put in?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—And those instructions are on record?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—And were followed?

Mr. MILLIKEN.—Yes, sir. Mr. Kinloch in a great many ways directed where the riveting should be done on account of the joint; they all had to be in perfect contact and that examination was made by Mr. Kinloch and that particular joint would not be driven until he said it was satisfactory.

Prof. GALBRAITH.—Would the reports include interim statements as to the condition of the riveted joints before the riveting took place, but after the pieces were partially bolted in position; would the reports state the condition of the bolting that preceded the riveting?

Mr. MILLIKEN.—The reports would indicate that, yes, sir, that the joints had been bolted up as instructed.

Prof. KERRY.—That would be Mr. Yenser's daily report?

Mr. MILLIKEN.—Yes, sir.

Prof. GALBRAITH.—Is there anything further along the line of general instructions, any further information that you could give us?

Mr. MILLIKEN.—Not at this time, I do not think of anything; no, sir.

Prof. GALBRAITH.—If you see clearly that we have omitted any important thing you ought to make the statement?

Mr. MILLIKEN.—Yes, sir, I will be glad to do that.

The commission took recess.

AFTERNOON SESSION—SECOND DAY.

The commission resumed at 2 o'clock.

Mr. HOLGATE.—Are there any matters, Mr. Milliken, that you would like to enlarge on or qualify?

Mr. MILLIKEN.—Well, in connection with my evidence this morning, I would like to add that at times when I was on the work I went out over the work, usually daily, sometimes once, but several times, and conferred with the different foremen, and would talk to them individually, as to their individual and general duties in connection with the work, and examined the work in a general way. Quite often I would meet them and walk back with them after the day's work was over, and caution and

urge upon them the necessity of being very careful, and I must say that in every case everyone understood the importance of being perfectly safe in handling all parts of the work, and on those visits I would take a general observation of the work and see that in a general way it looked all right to me. And I had been up there on Sundays when there was no work being done at all, and I looked over the work generally.

Mr. HOLGATE.—In looking over the work does that mean from track level, or would you make inspections through the various systems of chords and bracings?

Mr. MILLIKEN.—Only in a general way.

Mr. HOLGATE.—Would you say that that inspection was made from track level?

Mr. MILLIKEN.—From track level, yes, sir.

Prof. GALBRAITH.—The track had sufficiently large open spaces at the sides, say to look at the lower chords and the lower connections and everything of that kind as you went on?

Mr. MILLIKEN.—Oh, yes, I could see from the tracks.

Prof. GALBRAITH.—The track was not boarded over?

Mr. MILLIKEN.—No, sir, there was ties, and I walked on the outside and walked from the edge of a floor beam to one of the vertical posts and made general observations, not because my attention had been called to any particular part of the work, but simply as a matter of personal interest to look it over.

Prof. GALBRAITH.—I think Mr. Milliken was to show specimens of reports.

Mr. MILLIKEN.—I think they are on the way down now, I told them to bring them right to the court.

The witness retired.

FRANK E. CUDWORTH, recalled.

Mr. HOLGATE.—Will you state, Mr. Cudworth, just what your position is in connection with the Phœnix Bridge Company?

Mr. CUDWORTH.—I am resident engineer in charge of the instrument work.

Mr. HOLGATE.—How long have you been in that position?

Mr. CUDWORTH.—Three years.

Mr. HOLGATE.—Were you there at the inception of the instrumental work?

Mr. CUDWORTH.—No, sir, not the very first; as Mr. Milliken said, the work started in July and I came in September the same year.

Mr. HOLGATE.—But since September, 1904, you have been continuously employed by the Phœnix Bridge Company on the Quebec bridge?

Mr. CUDWORTH.—Not all the time at the Quebec bridge, not all the time in winter, but I have been here all the working season and two winters.

Mr. HOLGATE.—Whenever work has been going on on the Quebec bridge since September, 1904, you were there.

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—So that you then would have the continuous records of the instrumental work at that bridge?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—Who appointed you, Mr. Cudworth?

Mr. CUDWORTH.—I came here through Mr. Treadwell, who was consulted in regard to the foundations for the false work.

Mr. HOLGATE.—To whom were you responsible?

Mr. CUDWORTH.—When there was no foreman in charge of the work here in Quebec I was responsible to the head office in Phœnixville; when there was a foreman in charge of the work I was directly responsible to him and indirectly responsible to the Phœnixville office in special cases.

Mr. HOLGATE.—And in the case of your responsibility to the general foreman, who was he?

Mr. CUDWORTH.—There have been three general foremen here since I came.

Mr. HOLGATE.—The first was?

Mr. CUDWORTH.—The first was Mr. E. J. Wickizer, the second Mr. Shoemaker, and the third Mr. Yenser.

Mr. HOLGATE.—Were the instructions in regard to your work given you in writing or verbally?

Mr. CUDWORTH.—The instructions from the general foreman were given to me verbally, and I also received verbal instructions from both Mr. Deans and Mr. Milliken with reference to the work, and in some cases written instructions from Phœnixville.

Mr. HOLGATE.—Had you a system of reports?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—Daily reports?

Mr. CUDWORTH.—No, sir.

Mr. HOLGATE.—What were the periods at which they were made?

Mr. CUDWORTH.—The periods were at stated intervals, they were at times when the erection had progressed to a certain point.

Mr. HOLGATE.—They were not at regular intervals?

Mr. CUDWORTH.—No, sir.

Mr. HOLGATE.—To whom were those reports made?

Mr. CUDWORTH.—The reports were given to the foreman to go to Phœnixville. They went through the general foreman, through the office.

Mr. HOLGATE.—Have you copies of them, of these reports?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—You can let us have those?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—In connection with those reports had you any system of photography?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—Have you kept a consecutive series of photographs giving your work?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—Showing the progress?

Mr. CUDWORTH.—Showing the progress of the work.

Mr. HOLGATE.—If we could have those to look over too.

Mr. CUDWORTH.—Perhaps it would be better for you to consult either Mr. Deans or Mr. Milliken about this, as I have not all of them here.

Mr. DEANS.—We can furnish you a set of those views.

Mr. HOLGATE.—Whom did you consider your immediate superior, Mr. Cudworth, was it Mr. Yenser?

Mr. CUDWORTH.—Yes, sir; I received instructions from him in each case as to what work was needed immediately.

Mr. HOLGATE.—Could Mr. Yenser have dismissed you from the Phœnix Bridge Company's employ?

Mr. CUDWORTH.—I do not think he would have without consulting others; I could not say as to his authority to do that, but I do not think he would.

Mr. HOLGATE.—You did not think he could without reference to Phœnixville?

Mr. CUDWORTH.—No, sir.

Mr. HOLGATE.—Now you speak of the instrumental work; I wish you would just outline that work that comes under the head of instrumental work in connection with the making up of your periodical reports.

Mr. CUDWORTH.—In connection with the reports the instrumental work was such part of that work that you would use an instrument or rather engineers' appliances to get the information.

Mr. HOLGATE.—What information?

Mr. CUDWORTH.—The information as to lines and levels.

Mr. HOLGATE.—Lines of——

Mr. CUDWORTH.—Truss lines, or any lines or levels in connection with the work.

Mr. HOLGATE.—Lines of detailed parts of the structure?

Mr. CUDWORTH.—Yes, sir, and of the lines of the structure itself.

Prof. GALBRAITH.—Did you accept the lines and levels of the masonry work, or had they to be altered in any way for the purposes of the superstructure construction?

Mr. CUDWORTH.—The lines and levels used in building the bridge were given—the initial points were given by the Quebec Bridge and Railway Company's engineers, and they were checked in each case by myself.

Mr. HOLGATE.—And found correct?

Mr. CUDWORTH.—Yes, reasonably accurate.

Mr. HOLGATE.—In other words you did not start until you found these were correct?

Mr. CUDWORTH.—No, sir.

Mr. HOLGATE.—Now, was this instrumental work necessary continuously as erection progressed?

Mr. CUDWORTH.—Some of it was; yes, sir.

Mr. HOLGATE.—Just go over that, will you, with regard first of all to the erection of a panel of the bridge. Let us just understand your process with regard to the construction of the work. Take the cantilever arm, the panel in the cantilever arm?

Mr. CUDWORTH.—Well, in the cantilever arm the report of the elevation of the lower chord pins was taken immediately after the traveller was moved forward to erect a panel.

Prof. GALBRAITH.—That had been previously taken also?

Mr. CUDWORTH.—Yes, sir, it was taken every time the traveller was moved and at such other times as we considered necessary or convenient in erection; in fact the whole bridge was taken each time.

Mr. HOLGATE.—You worked back then, did you, from the land end and did you take those elevations continuously along all the points previously levelled over?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—And then out on the part being extended?

Mr. CUDWORTH.—Yes, sir, both on the anchor arm and the cantilever arm.

Mr. HOLGATE.—So that each time you did that you would have the information with regard to the levels and lines of the whole structure?

Mr. CUDWORTH.—It might not all be complete; as far as I remember they were complete in each case.

Mr. HOLGATE.—And these were recorded?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—And these were shown on your reports?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—And they will be in the reports that you will bring?

Mr. CUDWORTH.—Yes, sir.

Prof. GALBRAITH.—These levels to which you are now referring were the lines and levels of the lower chord pins only?

Mr. CUDWORTH.—Those were taken in each case and in some cases the others as well.

Prof. GALBRAITH.—The other pins?

Mr. CUDWORTH.—Some of the pins or other points.

Prof. GALBRAITH.—Any of the main pins in the upper chord?

Mr. CUDWORTH.—They were taken in the case of alignment, not levels.

Prof. GALBRAITH.—In case of alignment, not of levels?

Mr. HOLGATE.—Did your duties, Mr. Cudworth, embrace everything in the way of the inspection of material or workmanship?

Mr. CUDWORTH.—No sir, not directly.

Mr. HOLGATE.—Did they at all?

Mr. CUDWORTH.—They did in this way, that if I should see anything that did not look right, I would report it.

Mr. HOLGATE.—What were your relations with Mr. Birks?

Mr. CUDWORTH.—In regard to what respect?

Mr. HOLGATE.—In respect to duties.

Mr. CUDWORTH.—As I stated before, mine was in connection with instrument work and his duties have been defined by the others.

Prof. KERRY.—You were officials of equal standing, but you had special duties to perform?

Mr. HOLGATE.—Were you under Mr. Birks' instructions in any way?

Mr. CUDWORTH.—No, sir, not directly.

Mr. HOLGATE.—Did he in any way check your work?

Mr. CUDWORTH.—Some of it we did together; yes, sir. Where he had work that required assistance, I assisted him, and on the other hand, where I had work which required assistance, and there were no other people there, or for any other particular reason, I asked his assistance, he always gave it.

Mr. HOLGATE.—Now, did that occur in connection with the inspection of material?

Mr. CUDWORTH.—No, sir.

Mr. HOLGATE.—Not at all?

Mr. CUDWORTH.—I do not think of any instance.

Mr. HOLGATE.—Nor of workmanship.

Mr. CUDWORTH.—I do not recall any instance of that either.

Mr. HOLGATE.—What is your experience prior to coming on the Quebec bridge, Mr. Cudworth?

Mr. CUDWORTH.—Previous to working on the Quebec bridge I was in the Portsmouth navy yard, Department of Yards and Docks, a department of the navy of the United States government.

Mr. HOLGATE.—In what capacity were you there?

Mr. CUDWORTH.—I was there as draughtsman and inspector.

Mr. HOLGATE.—And for how long?

Mr. CUDWORTH.—About two years, as I remember; I do not know the exact date, I can furnish that if you wish. Before that I was in the Charlestown Navy Yard, as assistant to the engineer for the Philadelphia City Trust and Safe Deposit Company, who were finishing the contract for the Granite dry-dock in that yard.

Prof. GALBRAITH.—That is the yard at Boston?

Mr. CUDWORTH.—Yes, sir; and before that I worked for the City Engineer of Medford, Mass, before that on the erection of the Mount Washington Hotel at Burton Woods, New Hampshire.

Mr. HOLGATE.—Were any of these bridge structures?

Mr. CUDWORTH.—No, sir.

Mr. HOLGATE.—Then the first bridge structure that you had been connected with was the Quebec bridge?

Mr. CUDWORTH.—Yes, sir, the steel work at the hotel at Burton——

Mr. HOLGATE.—This other work, was it work calling for great accuracy?

Mr. CUDWORTH.—Yes, sir; there is that at the hotel and that at the Charlestown Navy Yard on the drydock was accurate work; they set the stones in that dock to one-eighth of an inch. If you wish those dates I can furnish them.

Mr. HOLGATE.—I do not think it is necessary. Besides those reports, is there any information that you think of in the way of diaries or other matter that you have that in your opinion would explain the matter any more clearly to us? If there is and we do not know of it, I wish you would collect it together and let us know about it, so that we can see if there is anything that would give us further information. Would those reports show anything out of alignment?

Mr. CUDWORTH.—Yes, sir, they give the alignment.

Mr. HOLGATE.—Do they give the alignment of the centre post?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—And any variations in alignment?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—Of the centre post?

Mr. CUDWORTH.—The alignment of the centre post has been taken continuously, I think, since the first section was placed each time the traveller was moved, and at any other times when it was in use in erection.

Mr. HOLGATE.—Would it also show the position in elevation of the anchor end post, and the main post?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—From time to time that would be shown?

Mr. CUDWORTH.—Yes.

Mr. HOLGATE.—Oh, by the way, you are a graduate and a civil engineer?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—What school?

Mr. CUDWORTH.—Thayer's school, in connection with Dartmouth College.

The witness retired.

NORMAN R. McLURE, recalled:—

Mr. HOLGATE.—What is your position, Mr. McLure, in regard to the Quebec bridge?

Mr. McCLURE.—I was inspecting engineer.

Mr. HOLGATE.—By whom were you appointed?

Mr. McLURE.—By Mr. Theodore Cooper, with the approval of Mr. Hoare.

Mr. HOLGATE.—Is that appointment in writing?

Mr. McLURE.—No, sir.

Mr. HOLGATE.—Was the approval in writing?

Mr. McLURE.—I believe not, although I believe there was some correspondence.

Mr. HOLGATE.—Did any of that correspondence come to you?

Mr. McLURE.—No, sir.

Mr. HOLGATE.—When were you appointed?

Mr. McLURE.—I started my duties on April 10, 1905; I do not remember the exact date of appointment, it would be before that.

Mr. HOLGATE.—What were your duties?

Mr. McLURE.—In the first place I was sent to the shops at Phœnixville, to assist the shop inspector until the erection started, and there, too, I familiarized myself with the details of the work. After that I had written instructions from Mr. Cooper as to my duties.

Mr. HOLGATE.—You have?

Mr. McLURE.—Yes, sir.

Mr. HOLGATE.—Have you got them with you?

Mr. McLURE.—Yes, sir.

(Document produced.)

Mr. HOLGATE.—Will you read that letter out, Mr. McLure, starting with the date? First of all, this is what, a letter of instructions from Mr. Cooper to yourself?

Mr. McLURE.—Yes, sir.

(Reading):—

'August 26, 1905.

'You will proceed to Quebec and report to the chief engineer, Mr. E. A. Hoare.

'You will act in unison with the assistant engineer of the Phœnix Bridge Company in all matters of the erection.

'Make periodical inspection of the false work and plant.

'Watch the methods of handling and hoisting all the pieces to see that no risks of loss or injury to the members are taken during these operations

'You will check with him all measurements and lines.

'You will see that the work as erected, is made secure before the next step is taken.

'See that the bed plates are exactly located and bedded according to the requirements.

'Report to me once a week the progress and condition of the work. If any unforeseen difficulties occur in the operations describe the same clearly so that I can keep in touch with the work.

'You will watch during the various conditions of the erection the changing cambers and opening and closing of the joints. While these changing joints are to be made secure, temporarily you will not permit them to be riveted until in proper condition.

'You will carry out such other instructions as may be given you by the chief engineer.

'You will keep an office diary of the work done each day, and note therein any points of special interest.

THEODORE COOPER.'

Mr. HOLGATE.—These reports, were they duly made?

Mr. MCLURE.—Yes.

Mr. HOLGATE.—On a proper form?

Mr. MCLURE.—The weekly reports?

Mr. HOLGATE.—Yes?

Mr. MCLURE.—No, just by letter.

Mr. HOLGATE.—Have you copies of these?

Mr. MCLURE.—Yes.

Mr. HOLGATE.—Just make a note to get these reports together.

Mr. MCLURE.—They are all in one letter book.

Mr. HOLGATE.—Make a note of the letter book, then. It will appear from that letter of Mr. Cooper's that you might, from time to time, receive instructions from Mr. Hoare?

Mr. MCLURE.—Yes, sir.

Mr. HOLGATE.—Did you?

Mr. MCLURE.—Not in writing.

Mr. HOLGATE.—No instructions in writing?

Mr. MCLURE.—No, sir, all verbal.

Mr. HOLGATE.—When instructions of a verbal nature would be given by Mr. Hoare, would these be noted in your diary?

Mr. MCLURE.—I do not think so.

Mr. HOLGATE.—What would your diary consist of?

Mr. MCLURE.—Just the material erected each day and any unusual point that might turn up.

Mr. HOLGATE.—Would it indicate Mr. Hoare's presence on the work?

Mr. MCLURE.—No, sir; it might in a few instances, but not every time.

Mr. HOLGATE.—To whom did you consider yourself directly responsible on the work?

Mr. MCLURE.—To Mr. Cooper and Mr. Hoare jointly.

Mr. HOLGATE.—Was there any precedence? Did Mr. Cooper dominate any more than Mr. Hoare, or vice versa?

Mr. MCLURE.—I never had any occasion to bring that question up.

Mr. HOLGATE.—In case of difficulties arising, whose opinion or judgment did you rely upon?

Mr. MCLURE.—I would have relied upon Mr. Cooper, as he was a specialist.

Mr. HOLGATE.—Did you ever have occasion to consult Mr. Cooper on matters that you did not consult Mr. Hoare upon?

Mr. MCLURE.—Never on matters that I did not notify Mr. Hoare about at the same time.

Mr. HOLGATE.—When Mr. Hoare was notified of these matters did he deal with them himself or did he submit them to Mr. Cooper.

Mr. MCLURE.—Not if I told him that I had referred them to Mr. Cooper also. He relied upon Mr. Cooper's decision.

Mr. HOLGATE.—What matters did Mr. Hoare deal with?

Mr. MCLURE.—As far as I was concerned principally with the monthly estimates of the material erected.

Mr. HOLGATE.—Did you make these returns to Mr. Cooper?

Mr. MCLURE.—Estimates of material erected?

Mr. HOLGATE.—Yes?

Mr. MCLURE.—No, sir; I made them direct to Mr. Hoare.

Mr. HOLGATE.—Mr. McLure, you might give us an idea of the routine of your monthly work, embracing your various duties. Trace out, for instance, the arrival of material and its progress.

Mr. MCLURE.—Our months were so different and irregular that it is pretty hard to compare one with another.

Mr. HOLGATE.—Take it consecutively from, say, the arrival of material on cars at the site forward to its destination at the bridge.

Mr. MCLURE.—On its arrival at the bridge I always made it a point to look every piece over thoroughly before being erected, to see if I could find anything wrong with it.

Mr. HOLGATE.—In what way did you check that?

Mr. MCLURE.—By eye.

Mr. HOLGATE.—Yes?

Mr. MCLURE.—And in the case of pins, by measurement and spacing of eye bars by measurement. I watched the attachment of the erection appliances and the handling of all the pieces while being erected to see that no injury was by any chance done to them. I watched the driving of all pins and the making of every connection.

Prof. GALBRAITH.—You saw that the men followed the blue printed instructions?

Mr. MCLURE.—Yes, sir, I made myself satisfied that they did.

Prof. KERRY.—You had copies of all these instructions?

Mr. MCLURE.—Of practically all.

Prof. KERRY.—Which were given you by———?

Mr. MCLURE.—Which were furnished me by the Phœnix Bridge Company.

Prof. KERRY.—Through Mr. Yenser?

Mr. MCLURE.—Sometimes and sometimes direct.

Mr. KERRY.—From the office?

Mr. MCLURE.—From Phœnixville.

Mr. HOLGATE.—In your inspection of material had you the right to reject it?

Mr. MCLURE.—In the event of damage?

Mr. HOLGATE.—In the event of anything being incorrect or not suitable for the work.

Mr. MCLURE.—Not before reporting it to Mr. Hoare.

Mr. HOLGATE.—Your process then would be, if you found anything of that nature, to report it to Mr. Hoare?

Mr. MCLURE.—Yes.

Mr. HOLGATE.—Would he decide?

Mr. MCLURE.—I do not know. That is for him to say.

Mr. KERRY.—Were there specific cases in which it did happen?

Mr. MCLURE.—No, sir, we never had occasion to reject anything on the erection.

Prof. KERRY.—All the material that came down was satisfactory and was erected?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—You never had occasion to send a piece back from the bridge?

Mr. McLURE.—Never.

Mr. HOLGATE.—Were these inspections here made at the bridge when the Phœnix Bridge Company brought the material up for erection, or were they made in the yard?

Mr. McLURE.—At the bridge—on the cars on the bridge.

Mr. HOLGATE.—On the erection cars?

Mr. McLURE.—Yes, sir.

Mr. HOLGATE.—There was no inspection previously on your part?

Mr. McLURE.—Occasionally there was in the storage yard.

Prof. KERRY.—Under what circumstances?

Mr. McLURE.—I made frequent visits to the storage yard just to look the metal over—not for any specific purpose.

Mr. HOLGATE.—Your duties then did not extend to the material in the storage yard?

Mr. McLURE.—No, sir.

Mr. HOLGATE.—Who, representing the Quebec Bridge Company, would have duties extending there?

Mr. McLURE.—Mr. Kinloch, I should think.

Mr. HOLGATE.—Who is Mr. Kinloch?

Mr. McLURE.—Inspector.

Mr. HOLGATE.—Whose inspector?

Mr. McLURE.—Mr. Hoare's.

Mr. HOLGATE.—Whose directions did he come under?

Mr. McLURE.—Mr. Hoare's.

Mr. HOLGATE.—Is he under you in any way?

Mr. McLURE.—Not in any way.

Mr. HOLGATE.—You kept a diary, Mr. McLure?

Mr. McLURE.—Yes, sir.

Mr. HOLGATE.—And you made these periodical reports?

Mr. McLURE.—Yes, sir.

Mr. HOLGATE.—You have all these?

Mr. McLURE.—Yes.

Mr. HOLGATE.—Have you any further details of the progress of the work on record? For instance, take the case—I only mention it as an instance showing what I mean—of the assembling of joints, the riveting of joints and their condition?

Mr. McLURE.—You mean in the erection?

Mr. HOLGATE.—Yes, their condition from time to time and up to August 29.

Mr. McLURE.—I have some records in field notebooks, outside of the diary.

Mr. HOLGATE.—You might look these up, Mr. McLure. We will want these later.

Mr. McLURE.—Do you want the diary, too?

Mr. HOLGATE.—Yes. And if you have any photographs of various points that would explain anything in the reports or the diary I wish you would look them up, too, and let us have them altogether?

Mr. McLURE.—All right.

Prof. KERRY.—Had you any regular method of recording progress, Mr. McLure, in the sense of recording when each member was placed and when each connection was complete?

Mr. McLURE.—I have diagrams showing the date when each main member was erected, and I incorporated in my weekly reports to Mr. Cooper a diagram showing the condition of the erection. That will be with my reports.

Prof. KERRY.—But in regard to the details as to the connection?

Mr. McLURE.—As to the bolting?

Prof. KERRY.—Yes, the bolting and riveting.

Mr. McLURE.—No, I have not any detailed reports on that.

Prof. KERRY.—You have no record of progress?

Mr. McLURE.—No, sir.

Prof. KERRY.—You stayed here all through the year, Mr. McLure?

Mr. McLURE.—Only during the erection.

Prof. KERRY.—What would you be doing in the balance of the year?

Mr. McLURE.—I would be in Phœnixville helping the shop inspectors.

Prof. KERRY.—Inspecting the material in its preparation?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—Have you any other records of any kind that we have not heard of, Mr. McLure, in the way of technical records bearing on the work, such, for example as wind and deflection records or anything of that kind?

Mr. McLURE.—They will all be incorporated either in my diary or in my field notes, both of which I have noted here.

Prof. KERRY.—They are not kept as a separate record?

Mr. McLURE.—No, sir.

Prof. GALBRAITH.—Have you a record of all the movements made by the bridge after the erection of each part or, say, at stated intervals, the general movements that are made in the construction of the bridge?

Mr. McLURE.—Yes, sir.

Prof. GALBRAITH.—You have that complete?

Mr. McLURE.—Yes.

Prof. GALBRAITH.—The time, temperature, wind stress, condition of the joints and everything else?

Mr. McLURE.—Yes. I have it complete, but it is in my notes.

Prof. GALBRAITH.—It can be worked out from your notes?

Mr. McLURE.—Yes, sir.

Prof. GALBRAITH.—You can answer questions on any of these points?

Mr. McLURE.—Yes.

Prof. KERRY.—Is that information that Prof. Galbraith has spoken of condensed to any extent in your reports?

Mr. McLURE.—Yes.

Mr. HOLGATE.—To what extent, if at all, did you check up the work of Mr. Cudworth and Mr. Birks?

Mr. McLURE.—Mr. Cudworth and I usually worked together. We helped each other. We get the same information at the same time.

Prof. KERRY.—In the question of levels, for example, just as an instance, would they be taken once or taken twice?

Mr. McLURE.—Taken once.

Prof. KERRY.—One man observing it?

Mr. McLURE.—One man observing it.

Prof. GALBRAITH.—It would be taken by the two of you?

Mr. McLURE.—Yes, we worked together.

Prof. KERRY.—It really would not be a check?

Mr. McLURE.—No.

Prof. KERRY.—Two men worked together?

Mr. McLURE.—Yes.

Prof. KERRY.—One man with the rod and the other with the level?

Mr. McLURE.—Yes.

Mr. HOLGATE.—Was there any checking on your part?

Mr. McLURE.—Of the levels?

Mr. HOLGATE.—Yes.

Prof. KERRY.—Independently of the work of Mr. Cudworth?

Mr. McLURE.—In a few instances.

Mr. HOLGATE.—How did you find that checking? Do you recollect an instance?

Mr. McLURE.—I do not just remember now.

Prof. GALBRAITH.—Did you make these checks together or did you do it yourself? Was Mr. Cudworth with you repeating the work of checking?

Mr. McLURE.—No, not at any time that I would consider it a check.

Prof. KERRY.—Will you run over briefly, your general experience, Mr. McLure, please, and where you graduated?

Mr. McLURE.—I graduated at Princeton University. I executed dock work for the Pennsylvania railroad, ran profile for the Pennsylvania railroad as chainman and rodman, instrument man on the Baltimore & Ohio railroad and in the divisional engineer's office with the Erie railroad, and inspector of bridges for the New York, Ontario & Western railway.

Prof. KERRY.—That is part of the maintenance of way of the railway?

Mr. McLURE.—Yes, sir; maintenance of way and construction, both in the same department.

Prof. KERRY.—Any structures of importance?

Mr. McLURE.—The principal structures were long viaducts.

Prof. KERRY.—You might give the stenographer the dates of your whole connection—the dates of your graduation and so on.

Mr. McLURE.—Graduated 1904; Pennsylvania railroad 1901; Baltimore & Ohio 1902; Erie 1903; Ontario & Western 1904-5.

Mr. HOLGATE.—You said you graduated when?

Mr. McLURE.—1904. This is summer work.

Mr. HOLGATE.—In what capacities were you on these works, Mr. McLure?

Mr. McLURE.—I started in as chainman on the Pennsylvania railroad and got to be inspector. At the end of my work I was inspecting construction. On the Baltimore & Ohio I was instrument man, on the Erie in the same capacity, and on the Ontario & Western, inspector of bridges.

Mr. HOLGATE.—In responsible charge of these bridges?

Mr. McLURE.—Yes, sir; both old structures and new structures.

Mr. HOLGATE.—How do you mean about that responsible charge, Mr. McLure?

Mr. McLURE.—I was responsible to the engineer of maintenance of way.

Mr. HOLGATE.—Were you in responsible charge of the Quebec bridge?

Mr. McLURE.—What do you mean by responsible charge?

Mr. HOLGATE.—What is your official designation?

Mr. McLURE.—As I understand it, it was inspecting engineer; that is what I was on the roll as.

Mr. HOLGATE.—In the event of necessity arising, which it did not, who could dismiss you?

Mr. McLURE.—Either Mr. Hoare or Mr. Cooper, I should think.

Mr. HOLGATE.—Either one or the other?

Mr. McLURE.—I should think so. I do not like to state personally. I know Mr. Cooper could.

Mr. HOLGATE.—You know that Mr. Cooper could?

Mr. McLURE.—Yes, sir.

Mr. HOLGATE.—Are you sure that Mr. Hoare could not?

Mr. McLURE.—No, sir.

Mr. HOLGATE.—Were you doubtful?

Mr. McLURE.—That is rather an embarrassing question.

Prof. KERRY.—You were paid by the Quebec Bridge Company?

Mr. McLURE.—By the Quebec Bridge Company?

Prof. KERRY.—Not by Mr. Cooper.

Mr. McLURE.—No, sir.

Prof. GALBRAITH.—You were paid by the Quebec Bridge Company?

Mr. McLURE.—Yes, sir; so was Mr. Cooper.

Mr. HOLGATE.—Do you feel that you would like to explain anything in regard to what you have said, Mr. McLure, that would make it clearer?

Mr. McLURE.—I do not think of anything just now unless there are some points you would like to have explained.

Mr. HOLGATE.—I do not think so. I thought that perhaps from your own point of view you might like to say something. If you would be good enough to get together those things——

Mr. McLURE.—Yes, I have a memorandum down here. I will bring everything together.

Witness retired.

EPHRAIM ROBERT KINLOCH, sworn.

Mr. HOLGATE.—What is your position, Mr. Kinloch?

Mr. KINLOCH.—Inspector.

Mr. HOLGATE.—Inspector of what?

Mr. KINLOCH.—According to my instructions from Mr. Hoare, workmanship and genaral erection inspector.

Mr. HOLGATE.—By whom were you employed?

Mr. KINLOCH.—Mr. Hoare.

Mr. HOLGATE.—And to whom do you report?

Mr. KINLOCH.—I make no written reports. I report verbally to Mr. Hoare.

Mr. HOLGATE.—Was there any one on the work that you took instructions from?

Mr. KINLOCH.—No, sir. I say that advisedly. If anything turned up in the engineering line I had orders to consult with Mr. McLure in regard to what to do with it. That is outside of workmanship. If I would find anything that did not suit me in the line of the work, I took it up with Mr. McLure.

Mr. HOLGATE.—When were you appointed?

Mr. KINLOCH.—I have been twice on the one job. I was on the approach spans and then I was off and on again. I first came here for the Pittsburg Testing and Laboratory Company from Chicago, on the approach spans on the south shore, and when I left, Mr. Hoare asked me if I would come back for the big spans. We had some conversation on it and I told him that I would be glad to come back if I was not tied up some place else. That was in 1903.

Prof. GALBRAITH.—That was the last time, was it?

Mr. KINLOCH.—No, the first. We had some correspondence. I wrote to him; from 1904 to 1905 I was in Omaha, Nebraska—and he said that he would hold a position open for me. When I finished in Omaha I wrote to him again and he sent for me to come on. I think that was in June. I arrived here Dominion Day, I think—I have a diary of it—but it was either Dominion Day, or a matter of a day or two—I haven't it in mind—in 1905.

Mr. HOLGATE.—What was the condition of the work then?

Mr. KINLOCH.—They were just tipping out the jib on the traveller and there was a lot of wooden false work. They had not started to raise any iron or steel.

Mr. HOLGATE.—You were there practically during the erection of the anchor span?

Mr. KINLOCH.—Yes, sir, entirely.

Prof. KERRY.—And you were previously there as inspector representing the Inspection Company on the erection of the fixed span?

Mr. KINLOCH.—The approach span.

Prof. GALBRAITH.—Were you employed by the inspection company or Mr. Hoare?

Mr. KINLOCH.—At that time I was.

Prof. GALBRAITH.—What did you call that company,

Mr. KINLOCH.—The Pittsburg Testing and Laboratory Company; it has another name in this country, I guess.

Prof. GALBRAITH.—From Chicago?

Mr. KINLOCH.—Pittsburg.

Prof. GALBRAITH.—I thought you said Chicago?

Mr. KINLOCH.—They have offices all over. I was working out of the Chicago office when I was ordered here.

Mr. HOLGATE.—Let us understand clearly, Mr. Kinloch, what you understood your duties to be and as you carried them out. Begin with the arrival of the construction material and go right on.

Mr. KINLOCH.—Well, I was supposed to see that the iron was in good shape before it went into the bridge.

Mr. HOLGATE.—Where?

Mr. KINLOCH.—Whenever I got a chance to inspect it. As a general thing I got it on the bridge.

Mr. HOLGATE.—What was your system?

Mr. KINLOCH.—My system was when a car came in there to get on the car.

Mr. HOLGATE.—That is a car from the railway delivering the material?

Mr. KINLOCH.—No, the car from the storage yard. That is most of it; some of it we got over in the storage yard and before it was off the car, and some we got in a pile in the storage yard. There was no general inspection over there, but in case we discovered some little thing working one way we went over to the storage yard to see if there was anything more of the same kind, regarding the painting and one thing and another in that way.

Mr. HOLGATE.—You never went over to the storage yard except under those conditions?

Mr. KINLOCH.—No. At first when I did not have anything to do I put in pretty nearly all the time over in the yard familiarizing myself with the different pieces.

Mr. HOLGATE.—It was not part of your duty to make any inspection in the storage yard,

Mr. KINLOCH.—No, sir, I did not consider it as such.

Mr. HOLGATE.—And you did not do it?

Mr. KINLOCH.—No, sir.

Mr. HOLGATE.—Then where did your inspection begin?

Mr. KINLOCH.—It began before the iron got into the bridge.

Mr. HOLGATE.—On delivery cars from the storage yard?

Mr. KINLOCH.—Mostly; yes, sir.

Mr. HOLGATE.—And how was that inspection made?

Mr. KINLOCH.—When a piece came in I got up and looked at it to see if it was straight and no bent members in it. I did not check it up by measurement to see if it complied with the plans but I gave it a general inspection for workmanship and to see that it had not been damaged any since it left the other inspector.

Mr. HOLGATE.—Where was he?

Mr. KINLOCH.—At Phœnixville, I suppose.

Mr. HOLGATE.—What marks would you recognize to show you that it had gone through that inspector's hands?

Mr. KINLOCH.—A big letter 'Q' with a stamp in the centre of it—'Q B.'

Mr. HOLGATE.—And if you did not see that you would not pass the piece?

Mr. KINLOCH.—If I did not see that I would just simply look at it and see that it was all right.

Mr. HOLGATE.—Were these marks on every piece?

Mr. KINLOCH.—I could not swear they were.

Prof. GALBRAITH.—Then a piece might have been passed without that mark on, as far as you know?

Mr. KINLOCH.—It might have passed him without that mark on, yes. I never looked for the mark on every piece.

Mr. HOLGATE.—Did you mark them yourself?

Mr. KINLOCH.—Not unless there was something wrong with them.

Mr. HOLGATE.—Was there any report sent up from the inspector's saying that this piece had been inspected?

Mr. KINLOCH.—To me?

Mr. HOLGATE.—Had any report reached you through any channel at all saying that the various parts had been inspected and passed by the inspectors at Phœnixville?

Mr. KINLOCH.—No.

Prof. KERRY.—In case a member had something wrong with it, what was your procedure?

Mr. KINLOCH.—It depends on what it was. A bent angle, or something like that; I simply marked it to be straightened or cut off. I never found anything but simply some trifling thing like that.

Prof. GALBRAITH.—You wrote your direction on the piece, did you?

Mr. KINLOCH.—Yes. I examined the joints to see that they were clear of rust and stuff like that or anything that was liable to be in them so that when they went to make them they could not pull them in. In the case of bars I measured the bars to see that they were the right bars and that they were painted before assembling. I also examined any piece that went in an inaccessible place to see that it was painted because it could not be painted after it was up. I made a general all round inspection to see that every thing was in good workmanlike shape.

Mr. HOLGATE.—In detail, now, on the inspection, what about the inspection and the placing of members and their connections, riveting and bolting and things of that nature? Just give us clearly how you proceeded with the work and what was your system of inspection.

Mr. KINLOCH.—I do not just get your meaning, Mr. Holgate.

Mr. HOLGATE.—Did you have a specification or definite instructions to guide you in your inspection, and did you carry out your inspection up to these instructions?

Mr. KINLOCH.—I have a copy of a little pamphlet from the Phœnix Company giving the method of erection.

Mr. HOLGATE.—Have you that now?

Mr. KINLOCH.—No, I haven't it here.

Mr. HOLGATE.—Would you recognize it if you saw it?

Mr. KINLOCH.—Yes, sir.

(Mr. Deans handed to the chairman a number of small blue prints fastened together.)

Mr. HOLGATE.—Have you your own copy, Mr. Kinloch?

Mr. KINLOCH.—Yes, sir. I have not this in full. It is one similar to it.

Mr. HOLGATE.—But you have your own copy and can produce it?

Mr. KINLOCH.—Yes.

Mr. HOLGATE.—It is generally in this form, but you do not know that it is the same?

Mr. KINLOCH.—I am just shy some pages; that is all.

Mr. HOLGATE.—You can produce your own copy?

Mr. KINLOCH.—Yes.

Mr. KERRY.—You inspected the workmanship on the joints, as it were, put in on the bridge in detail, Mr. Kinloch?

Mr. KINLOCH.—You mean when they were riveted?

Prof. KERRY.—Yes?

Mr. KINLOCH.—There was no riveting done on the joints until a long time after they were put in?

Prof. KERRY.—The joints were just bolted and let stay?

Mr. KINLOCH.—Yes, sir. With the peculiar method of erection they had here they could not do it otherwise. The holes did not come good.

Prof. KERRY.—You checked up the temporary fastenings which could not be riveted?

Mr. KINLOCH.—Yes.

Prof. KERRY.—To see——?

Mr. KINLOCH.—To see that they were safe.

Prof. KERRY.—Sufficiently bolted?

Mr. KINLOCH.—Yes.

Prof. KERRY.—You were guided in that by the instructions of the Phœnix Bridge Company?

Mr. KINLOCH.—I——

Prof. KERRY.—How did you determine whether a joint was sufficiently bolted?

Mr. KINLOCH.—By the instructions of the Phœnix Bridge Company and by my own experience.

Prof. GALBRAITH.—Would you fill all the holes with your bolts that could be filled at the time?

Mr. KINLOCH.—We filled them all before we got the maximum weight they were to get.

Prof. GALBRAITH.—In any particular state were all the holes that possibly could be filled with the bolts you had, filled? Of course, that is a matter that I had better perhaps avoid at present.

Mr. KINLOCH.—The chord joints were filled with what sizes of bolts they could get in.

Prof. GALBRAITH.—All the chord joints were filled?

Mr. KINLOCH.—Yes, practically.

Prof. GALBRAITH.—Where they overlapped, assuming that you had no bolts small enough, these were necessarily left out?

Mr. KINLOCH.—I do not think that there were any left out. They had bolts down as small as five-eighths.

Prof. KERRY.—The joints were completely bolted?

Mr. KINLOCH.—Practically so. There might be 20 or 30 bolts out of a joint where there were 400.

Mr. HOLGATE.—What jurisdiction had you over the men who were actually doing the work?

Mr. KINLOCH.—Mr. Holgate, I do not know as I had any, but if I found a man doing anything wrong I stopped him. I do not know where I got that authority to do that any more than any inspector would have. No one told me I could, but I simply did it, and if he would not stop I took it to the foreman, and I never had to do any more than that.

Mr. HOLGATE.—But you had not definite instructions to guide you in a case of that kind?

Mr. KINLOCH.—No, I did not think any were necessary.

Mr. HOLGATE.—You did not find it necessary in the progress of the work to get written instructions?

Mr. KINLOCH.———

Prof. KERRY.—During the work everything that you considered necessary as to the quality of the workmen or of the workmanship was done on your request?

Mr. KINLOCH.—There is a line to draw. There were some things I wanted done that I did not get done, but they were taken up and they never have been settled yet. It was out of the line of workmanship, though.

Prof. KERRY.—As far as the line of workmanship is concerned?

Mr. KINLOCH.—I never had any trouble.

Prof. KERRY.—Everything you wanted was done?

Mr. KINLOCH.—Yes.

Mr. HOLGATE.—In regard to the other matters that you have just referred to, do they concern the matter?

Mr. KINLOCH.—Concern the——?

Mr. HOLGATE.—This question?

Mr. KINLOCH.—You mean the collapse?

Mr. HOLGATE.—No, but the explanation of your duties.

Mr. KINLOCH.—I do not just understand you.

Mr. HOLGATE.—Perhaps we will bring that up again and we will give you a full

chance to explain what you mean. What has your previous experience been in bridge erection?

Mr. KINLOCH.—I have been at it ever since I have been a boy—since I was 16 years old.

Mr. HOLGATE.—What large or important structures have you had to do with?

Mr. KINLOCH.—The Chillicothe bridge across the Illinois, the Fort Madison across the Mississippi river, the Cairo bridge across the Ohio, Merchant's bridge at St. Louis across the Mississippi, a lot of small spans, over 150 feet of one kind and another, the Boone viaduct, Iowa, St. Joe bridge across the Missouri river, the Omaha draw, and numerous bascule bridges in Chicago.

Mr. HOLGATE.—In connection with these works were you the foreman or superintendent in charge of the erection?

Mr. KINLOCH.—No, sir; on some of them I just worked, on some of them I was inspector, on some of them I was in charge, and on some of them I was the assistant.

Mr. HOLGATE.—On which of these were you in chief charge?

Mr. KINLOCH.—On the bascules in Chicago I had charge of putting in all the machinery, operating them, turning them over to the drainage and instructing the drainage how to run them.

Prof. GALBRAITH.—That is for the drainage canal?

Mr. KINLOCH.—For the drainage canal.

Prof. HOLGATE.—Is that the only one?

Mr. KINLOCH.—There were Main street, State street, Randolph street and Canal street—four of them. I was there for three or four years.

Prof. KERRY.—It might be well to trace back these structures that you mention and say what your connection was with each one of the more important of them?

Mr. KINLOCH.—The Chillicothe bridge, the first one I worked on, I worked on the preliminary survey, and all the way from pile driver to inspector of masonry. Then, I was on the Sante Fé. That was on the construction of the Sante Fé. I was in the engineering department. The rest of the gang got laid off. We gradually extended our division until we took in all those bridges and I had to do with this in the capacity of inspector under Mr. Richardson. From there I went to Cairo where I worked as a common labourer and afterwards as bridge man. I worked in the gang hustling iron and then I worked as an erector. After that I just had different jobs around. I worked just as an erector until 1896 or 1897, I think. I was assistant foreman on the Chicago & Northwestern Elevated Railway. That was about the time the American Bridge Company organized, and I was assistant foreman for them on all the work while I was with them—Boone, St. Jo, and the bascules—I had charge of the machinery.

Prof. KERRY.—After you left the American Bridge Company?

Mr. KINLOCH.—In the erection of the large Glasgow bridge across the Missouri, I was inspector for Mr. Zeising. I was also inspector of the Chicago and Northwestern railway on small jobs. I was with them for about six or seven months. Practically the whole of the time since 1887 I have been working on large bridges, with the exception of four years, when I was home.

Prof. KERRY.—You have had practically ten years' experience as assistant foreman?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—And about how many years' experience as inspector previous to 1905?

Mr. KINLOCH.—I was a year on that Glasgow job, I guess—almost a year; about eight or nine months with the Chicago and Northwestern, and, of course, I was with the Sante Fe for a couple of years when I was inspecting, but I did not know very much about it. I also put up a 200-foot span when I was home in the city. I was clerk at the time and I had charge of that, we took it away from the contractor, the company kind of fell down on it, and could not put it up after they got it.

Mr. HOLGATE.—Had you authority, Mr. Kinloch, to stop work on the part of the men engaged in doing it? Could you stop the work of a gang of men on the bridge?

Mr. KINLOCH.—No, sir; I had no authority to do that, not without taking it up with Mr. Hoare.

Mr. HOLGATE.—Who had?

Mr. KINLOCH.—I do not know.

Mr. HOLGATE.—In the event of your finding something that you thought it necessary to stop work in a certain place—I mean who had the authority to stop that work?

Mr. KINLOCH.—Mr. Yenser, I guess.

Mr. HOLGATE.—Mr. Yenser, you think had authority. Could you have stopped it?

Mr. KINLOCH.—Through Mr. Yenser I could, or by taking it up with Mr. Hoare I could stop it. Individually I could not go down and tell those men to stop, no.

Mr. HOLGATE.—You could not order them to stop?

Mr. KINLOCH.—No, sir.

Prof. GALBRAITH.—Did you consider it to be your duty in case you saw anything going wrong to talk with the foreman engaged in the work, and first to see if you could not get it made right, and if you should fail in having your suggestions adopted did you ever go to Mr. Yenser or Mr. Hoare or did you feel that it was your duty to go to Mr. Yenser or Mr. Hoare, or both?

Mr. KINLOCH.—Yes, sir.

Prof. GALBRAITH.—You felt that lay within your duties?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Do you feel that your presence there as inspector produced any better work than if you had not been there?

Mr. KINLOCH.—You mean if there had been no inspector there, or just me?

Mr. HOLGATE.—If there had been no inspector?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—You think so?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—You think that by keeping active and about the work it was an advantage to the work?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—That there were matters that you detected that upon speaking about them they were rectified?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Did that apply to all matters that you brought up? I do not want you to specify any matters?

Mr. KINLOCH.—No, sir.

Mr. HOLGATE.—Did it or did it not?

Mr. KINLOCH.—No, sir.

Mr. HOLGATE.—Those are matters that you referred to a little while ago, then?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—What general inspection did you give the structure in addition to seeing that the members were in good condition, seeing that the riveting was properly done? Did you give attention to the structure as a whole? Did you watch how it was working as it was extended out?

Mr. KINLOCH.—Yes, sir.

Prof. GALBRAITH.—That was among your duties, you considered that it was, at least?

Mr. KINLOCH.—I considered it myself amongst my duties to take a general watch and see how everything was working.

Prof. KERRY.—You have no specific instructions?

Mr. KINLOCH.—I had no specific instructions to go over it at stated intervals, over the work. My instructions were to see that everything was safe.

Prof. KERRY.—How often would you go over the structure? These instructions to see that everything was safe came from Mr. Hoare?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—And how often would you go over the structure for that purpose?

Mr. KINLOCH.—Well, it depended a good deal on the movements of the traveller and the different stages of erection.

Prof. KERRY.—Just whenever you thought it necessary.

Mr. KINLOCH.—Yes, sir, I had no stated intervals, sometimes it might be——

Prof. KERRY.—At that time would you go completely over the main members, for instance?—Would you pass along the top chord and see that everything was in order?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—And pass along the top chord before saying that everything was in order?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—It would not be a distant inspection, but a quite close detailed examination?

Mr. KINLOCH.—Yes, sir.

The witness retired.

NORMAN R. McLURE, recalled.

Mr. HOLGATE.—With regard to your authority in case of emergency conditions arising, how far did it go?

Mr. McLURE.—My understanding was that in case of emergency I was to report to Mr. Cooper by wire if possible.

Mr. HOLGATE.—First?

Mr. McLURE.—Yes.

Mr. HOLGATE.—The first report was to Mr. Cooper?

Mr. McLURE.—Yes.

Mr. HOLGATE.—And then you would wait to act until you got instructions from Mr. Cooper?

Mr. McLURE.—I had no authority to act without instructions either from him or Mr. Hoare.

Mr. HOLGATE.—Then you would report to Mr. Hoare?

Mr. McLURE.—Yes, sir, at the same time.

Mr. HOLGATE.—And you would act on instructions then from either of them?

Mr. McLURE.—Yes, sir.

Mr. HOLGATE.—Whichever came first?

Mr. McLURE.—Yes, sir.

Mr. HOLGATE.—Then with regard to your general inspection of the work on the structure as it progressed——

Mr. McLURE.—Inspection in what direction?

Mr. HOLGATE.—Not only of the work actually being done, but of the partly completed portions of the work; was that periodical or regular?

Mr. McLURE.—No, not at regular intervals, almost daily. I might miss a day once in a while, but very few days I was not over most of the bridge.

Mr. HOLGATE.—On track level?

Mr. McLURE.—No, on top chord and bottom chord, transverse struts and everywhere.

Prof. KERRY.—Did you keep any record of these inspections?

Mr. McLURE.—Not unless I found something that it was necessary to report.

Prof. KERRY.—Just in case there was something that you——

Mr. McLURE.—Yes, sir.

Prof. KERRY.—And it was part of your duty to keep the entire structure under observation in that way?

Mr. McLURE.—I understood so.

Prof. KERRY.—In those inspections were you sometimes accompanied by Mr. Birks?

Mr. McLURE.—Yes, I think so. Part of the way, anyway.

Prof. KERRY.—But not frequently?

Mr. McLURE.—Not frequently, no.

Mr. HOLGATE.—Now, you were on that work a long time, and there was Mr. Birks, Mr. Yenser, Mr. Cudworth, Mr. Kinloch and yourself together; you might just give me an idea what sort of a spirit existed amongst you all, was it a spirit of co-operation or was there antagonism?

Mr. McLURE.—No, it was entirely a spirit of co-operation; everybody was working to make a success of the bridge.

Mr. HOLGATE.—And that condition, was it continuous?

Mr. McLURE.—Absolutely. Of course, there were minor differences of opinion occasionally in discussions, but I am speaking in general.

Mr. HOLGATE.—I am speaking of the spirit, the prevailing spirit?

Mr. McLURE.—Yes, sir; it was entirely as I said, with a view to making a success of the bridge.

Mr. HOLGATE.—So that there was no bad feeling between those responsible on the work that might have probably on some conditions prevented work being carried on satisfactorily; that does not exist?

Mr. McLURE.—Does not exist at all.

The witness retired.

The Commission adjourned until to-morrow (Wednesday) morning at 10 o'clock.

THIRD DAY.

QUEBEC, WEDNESDAY, September 11, 1907.

The Commission resumed at 10 o'clock this morning.

ULRIC BARTHE recalled. He said:

After the Quebec Bridge Company was reorganized in 1897, a general plan was prepared by its chief engineer showing the location of the piers at the Chaudière site. This plan was submitted to the Dominion government and approved by the Railway Committee of the Privy Council, and also by the Governor General in Council. I produce, as Exhibit No. 2, the approval of the Railway Committee of the Privy Council and a copy of the Order in Council.

(Document produced, filed and marked as Exhibit No. 2.)

I produce, as Exhibit No. 3, the plan so prepared and approved.

(Document produced, filed and marked as Exhibit No. 3.)

I produce, as Exhibit No. 4, extracts from the minutes of meetings of the board of directors of the Quebec Bridge Company relating to the calling for tenders.

(Document produced, filed and marked as Exhibit No. 4.)

The specifications on which tenders were called for were submitted to the Department of Railways and Canals at Ottawa and were approved, and I produce, as Exhibit No. 5, the approval of the deputy minister.

(Document produced, filed and marked as Exhibit No. 5.)

A circular letter calling for tenders was issued, and I now produce the original draft of such letter, with form of tender attached, as No. 6.

(Document produced, filed and marked as Exhibit No. 6).

Accompanying the circular letter were specifications which I believe to be exactly similar to the schedules 'A' and 'A-1' annexed to the subsidy agreement between the Crown and the Quebec Bridge company under date November 12, 1900, which is filed as Exhibit No. 12 (document produced, filed and marked as Exhibit No. 12), save that the printed figures '1,000' on the first page of Schedule 'A-1' were corrected to '1,600'; and also a specification for a suspension bridge, copy of which is filed as Exhibit No. 7.,

(Document produced, filed and marked as Exhibit No. 7).

I produce the tender received from the Phœnix Bridge company and file it as Exhibit No. 8.

(Document produced, filed and marked as Exhibit No. 8.)

The tenders for both substructure and superstructure were submitted to Mr. Theodore Cooper, consulting engineer of New York, who had been retained as such by resolution of the Board, of date March 23, 1899, and on June 23, 1890, Mr. Cooper reported, and I file his original report as Exhibit No. 9.

(Document produced, filed and marked as Exhibit No. 9).

On June 29, 1899, the Board ordered that Mr. Cooper's report together with the Phœnix Bridge Co.'s tender and Wm. Davis and Sons' tender, and that of the Keystone Co. for the substructure and the plans be sent to the Prime Minister at Ottawa, which was done, and I produce a copy of the resolution of the Board of directors as Exhibit No. 10.

(Document produced, filed and marked as Exhibit No. 10).

I find among the minutes of the company a report from Mr. Theodore Cooper, consulting engineer, of date May 1, 1900 which I now file as Exhibit No. 11.

(Document produced, filed and marked as Exhibit No. 11).

On November 12, 1900, a subsidy agreement was executed between the Crown and the Quebec Bridge Company, and I now file as Exhibit No. 12, this agreement, to which are annexed as schedules 'A' and 'A-1 the specifications, copies of which were sent out with a circular letter inviting tenders. I note, however, that in the specification marked 'Schedule A-1' the length of the span, originally printed at 1,000 feet, has been altered to 1,800 feet in red ink. In the original specifications sent out inviting tenders the length of the suspended span was stated to be 1,600 feet.

(Document produced, filed and marked as Exhibit No. 12).

On December 19, 1900, contracts for the two approach spans were executed between the Quebec Bridge Company and the Phœnix Bridge Company, and these are filed as Exhibits Nos. 13 and 14.

(Documents produced, filed and marked as Exhibits Nos. 13 and 14.)

On January 17, 1901, the board passed a resolution approving the contracts previously executed which had been filed as Exhibits 13 and 14, and a copy of this minute is filed as Exhibit No. 15.

(Document produced, filed, and marked as Exhibit No. 15).

On June 19, 1903, a contract was executed between the two companies for the construction of the superstructure, and I now produce the original contract as Exhibit No. 16. It appears from the contract that there were plans and specifications annexed to the contract and forming part thereof, but those I have not been able to find up to the present time. I shall make further search and if I am able to find either or both plans and specifications, will produce them.

(Document produced, filed and marked as Exhibit No. 16).

On July 21, 1903 an Order in Council was passed, giving authority to Mr. Cooper to make some modifications in plans and specifications and a copy of this is filed and marked as Exhibit No. 17.

(Document produced, filed and marked as Exhibit No. 17).

On August 15, 1903, a further Order in Council was passed with respect to the powers and duties of the chief engineer, and a copy of this I file as Exhibit No. 18.

(Document produced, filed and marked as Exhibit No. 18).

I was asked to produce copies of all the annual reports of the directors of the Quebec Bridge Co. from 1897 to 1907 inclusive, and I now produce them as Exhibit No. 19.

(Document produced, filed and marked as Exhibit No. 19).

I was asked to produce the resolutions of the board of directors defining the position of Mr. Theodore Cooper as consulting engineer and I now produce copies of all such resolutions and file them as Exhibit 20.

(Document produced, filed and marked as Exhibit No. 20).

Mr. HOLGATE.—You are to produce letters between Mr. Cooper and the company?

Mr. BARTHE.—I have produced a resolution referring to the letters. I will produce the letters.

Mr. HOLGATE.—Yes, we want the letters themselves. We want the correspondence from and to Mr. Cooper relating to this matter.

Mr. STUART.—Do you mean relating to the whole thing or simply to his appointment?

Mr. HOLGATE.—In the meantime just to his appointment. We note that the specifications and plans connected with the contract with the Phœnix Bridge Company are not produced. These are necessary, and they must be produced; so we would ask you to take steps to locate them and bring them here.

Mr. BARTHE.—I will do whatever is possible.

Mr. HOLGATE.—Are there any other documents in the way of contracts or agreements that you are aware of connected with this matter, either with the city of Quebec or the province of Quebec?

Mr. BARTHE.—I do not know; I will see. I do not remember them.

Mr. HOLGATE.—If there are any of these documents, we would ask you to let us have them.

Mr. BARTHE.—Yes.

Commission took recess.

AFTERNOON SESSION—THIRD DAY.

Commission resumed at two o'clock.

EDWARD A. HOARE, sworn.

Mr. HOLGATE.—Will you please state what your position is in connection with the Quebec Bridge Company?

Mr. HOARE.—Chief Engineer of the Quebec Bridge and Railway Company.

Mr. HOLGATE.—By whom were you appointed?

Mr. HOARE.—The directors of the Quebec Bridge and Railway Company.

Mr. HOLGATE.—Do you remember the date?

Mr. HOARE.—In 1898 I was first employed on the first surveys, and so forth, and that class of work, and in 1900 an agreement was made for the continuation of my appointment till the completion of the work in connection with the bridge and the railway connections.

Mr. HOLGATE.—Were these appointments made only through the resolution of the board?

Mr. HOARE.—Yes.

Mr. HOLGATE.—Have you beer continuously acting in that capacity?

Mr. HOARE.—Yes.

Mr. HOLGATE.—Up to the present time?

Mr. HOARE.—Up to the present time.

Mr. HOLGATE.—Previous to your appointment, Mr. Hoare, will you give us an idea of your experience?

Mr. HOARE.—I have been employed for about 35 years in various works—railways in Ontario, government railways, several railways for private corporations, marine work and some waterworks.

Mr. HOLGATE.—You might be specific as to those if you can.

Mr. HOARE.—Name the different railways?

Mr. HOLGATE.—Yes.

Mr. HOARE.—The Great Western Railway.

Mr. HOLGATE.—With the periods.

Mr. HOARE.—I do not remember the dates.

Mr. HOLGATE.—As nearly as you can.

Mr. HOARE.—I could not remember them. I would have to refer back. My career extends over a period of about 35 years in Canada—on the Toronto, Gray & Bruce railway, which was my first employment out here; on the Wellington, Grey & Bruce; Wellington, Huron & Bruce; Great Western Railway of Canada (that is now the Grand Trunk) then the Provincial Government Railways for the province of Quebec now operated by the Canadian Pacific Railway Company; the Great Northern Railway; the Quebec & Lake St. John railway and several minor railways; part of the time in private practice and part of the time waterworks construction. I think that covers the majority. I cannot specify the dates; I can only generalize and say that it extended over a period of 30 or 35 years.

Mr. HOLGATE.—By reference, Mr. Hoare, I suppose you can get these dates thoroughly definite, can you not,

Mr. HOARE.—I think I can. I could not get them absolutely correct, but I can give you some dates in any case.

Mr. HOLGATE.—If you could get some definite dates on these matters I think it would be better.

Mr. HOARE.—Very well, I will try.

Mr. HOLGATE.—Could you get them in chronological order—the names of the railways and corporations that you were with?

Mr. HOARE.—Yes, I can get them in chronological order.

Mr. HOLGATE.—And the position you occupied in each case?

Mr. HOARE.—Yes.

Mr. HOLGATE.—And the length of time you were with each?

Mr. HOARE.—Yes, I can get that.

Mr. HOLGATE.—Especially in connection with bridge construction, what works had you in hand?

Mr. HOARE.—Just the bridges that one might have on railway work. The general run of bridges you have on railway work.

Mr. HOLGATE.—What class of bridges would that be?

Mr. HOARE.—Wooden trusses, steel trusses, girder work up to spans, I should say, of about 300 feet including the bridge over the Ottawa at Hawkesbury for the Great Northern Railway Company.

Mr. HOLGATE.—Any other special structures?

Mr. HOARE.—Nothing special. There were several large structures.

Mr. HOLGATE.—Which was the largest?

Mr. HOARE.—The Hawkesbury bridge, I think, is about the largest.

Mr. HOLGATE.—You might give us a description of the bridge.

Mr. HOARE.—It was not the largest span but it was the longest bridge. It was most important I think. There were seven spans of 210 feet across the Long Sault Rapids at Hawksbury and a bridge over the canal close at one end of it and a long timber viaduct, from memory, about 2,000 feet long. The bridge was about 50

feet above the river level, the piers were of masonry, about 12 feet of water and very swift current. That is the general description from memory.

Mr. HOLGATE.—These spans were 210 feet?

Mr. HOARE.—About 210 feet.

Mr. HOLGATE.—You have built some spans longer than 210 feet?

Mr. HOARE.—300 is the maximum.

Mr. HOLGATE.—Which bridge was that?

Mr. HOARE.—It was between 250 and 300 feet. That is on the same railway at Lachute.

Mr. HOLGATE.—Were these bridges for single or double track?

Mr. HOARE.—Single. There is one example I might mention which is quite a considerable structure—the double track bridge over the Chaudiere about 2,000 feet from the east end of the bridge over the St. Lawrence. It is a double track bridge, two spans of 200 feet, a span of 180 feet, a span of 100 feet and about 140 feet high.

Mr. HOLGATE.—When was that built?

Mr. HOARE.—That was completed in the early part of 1905 to the best of my memory.

Mr. HOLGATE.—Was that done in connection with your duties as engineer of the Quebec Bridge and Railway Company?

Mr. HOARE.—Quebec Bridge and Railway Company, that was part of my duty.

Mr. HOLGATE.—What position had you on the Great Northern?

Mr. HOARE.—Chief engineer of the railway company.

Mr. HOLGATE.—What connection had you personally with these bridges on the Great Northern?

Mr. HOARE.—I had to make the plans and specifications and see the work carried out. The details of these structures, of course, as usual, were made by the sub-contractors for the superstructure.

Mr. HOLGATE.—Who were they?

Mr. HOARE.—The Hamilton Bridge Company.

Prof. KERRY.—Was not the Great Northern Railway built under one general contract by contractors who took the entire responsibility?

Mr. HOARE.—Yes, the whole line was let to a firm of contractors on the specifications and plans prepared by the Great Northern Railway Company.

Prof. KERRY.—These were just simply general specifications?

Mr. HOARE.—No, they were detailed specifications covering every class of work on the road.

Prof. KERRY.—But the contractors took the entire responsibility, starting even from the location, subject only to approval?

Mr. HOARE.—No; the only part of the road not located was the section between Lachute and Grenville. The rest was all located; they had to complete that portion of the location subject to my approval. In other words they furnished the engineers to do the actual surveying but under my direction.

Mr. HOLGATE.—Then I understand that leads up to the viaduct connected with it?

Mr. HOARE.—That is about the last work I had before I was employed by the Quebec Bridge and Railway Company.

Mr. HOLGATE.—As chief engineer of the Quebec Bridge and Railway Company, what are your powers?

Mr. HOARE.—To take general charge of the work.

Mr. HOLGATE.—By that you mean the work itself?

Mr. HOARE.—Yes, to undertake the duties generally undertaken by the engineer for a company; that is, to make the surveys for the work, plans, specifications, the latter to a limited extent, prepare for contracts and see the work carried out, and to make progress estimates for payments to contractors.

Mr. HOLGATE.—That is in regard to all the company's operations?

Mr. HOARE.—Yes.

Mr. HOLGATE.—The bridge over the St. Lawrence river was then a portion of a vast undertaking?

Mr. HOARE.—Yes.

Mr. HOLGATE.—And in connection with that superstructure, what were your particular duties?

Mr. HOARE.—My first duty was to make a survey of the bridge site, take soundings and borings, locate the position of the bridge and the piers, and to have the general outline plans approved by the Department of Railways and Canals at Ottawa.

Mr. HOLGATE.—Were you required to certify to these plans before they were approved by the Department of Railways and Canals?

Mr. HOARE.—I do not remember that. I think I did certify them, but I do not know whether I was required to or not. I do not know whether it was an absolute necessity. I think I did.

Prof. KERRY.—Those were the usual preliminary plans, setting forth the span and the clearance above the waterway?

Mr. HOARE.—Yes, precisely.

Mr. HOLGATE.—Yes, Mr. Hoare?

Mr. HOARE.—After these plans were approved, establishing the minimum waterway——

Mr. HOLGATE.—How much was that?

Mr. HOARE.—1,600 feet of a minimum clearance for vessels. Tenders then were called for the bridge over the River St. Lawrence.

Mr. HOLGATE.—For the piers?

Mr. HOARE.—For all—for the superstructure and the substructure at the same time.

Mr. HOLGATE.—Prior to that, specifications would be prepared?

Mr. HOARE.—Yes, specifications were prepared, or specifications were prepared in connection with all these plans I have referred to.

Prof. KERRY.—Were the tenderers permitted to tender upon their own plans, Mr. Hoare, as far as structural outline went?

Mr. HOARE.—Yes, subject to the span, the clearance for vessels in both directions and the defined rail level.

Mr. HOLGATE.—What was the result of the inquiry for these tenders?

Mr. HOARE.—We got tenders from four corporations. The Phœnix Bridge Company submitted designs and tenders for two classes of bridge—for a cantilever and suspension bridge, superstructure and substructure, both inclusive. The Keystone Bridge Company, the Union Bridge Company and the Dominion Bridge Company, all submitted plans for both superstructure and substructure. I will not be positive whether these three latter companies submitted suspension designs or not, but I believe the Keystone and Union Bridge Companies did submit plans for both classes of bridging.

Mr. HOLGATE.—What was done with these submitted plans and propositions?

Mr. HOARE.—They were all referred to Mr. Cooper.

Mr. HOLGATE.—Under what circumstances were they referred to Mr. Cooper?

Mr. HOARE.—By order of the board.

Mr. HOLGATE.—In what capacity did Mr. Cooper act?

Mr. HOARE.—Consulting engineer.

Mr. HOLGATE.—Appointed by the board?

Mr. HOARE.—Yes, sir.

Mr. HOLGATE.—These plans were submitted to him for his report?

Mr. HOARE.—To be analyzed and to be reported upon.

Mr. HOLGATE.—What was his report?

Mr. HOARE.—He recommended the acceptance of the Phœnix Bridge Company's cantilever span.

Mr. HOLGATE.—What was the length of the span?

Mr. HOARE.—1,600 feet—channel span.

Mr. HOLGATE.—What was the next step taken by the company?

Mr. HOARE.—The next important step was the contract entered into with Phœnix Bridge Company.

Mr. HOLGATE.—Was that on the basis of their proposal?

Mr. HOARE.—Yes.

Mr. HOLGATE.—The same dimensions for the bridge were adhered to?

Mr. HOARE.—Yes.

Mr. HOLGATE.—1,600 feet?

Mr. HOARE.—Yes. No, pardon me; before a contract was actually signed the span was changed.

Mr. HOLGATE.—To?

Mr. HOARE.—1,800 feet.

Mr. HOLGATE.—This contract was on the basis of——?

Mr. HOARE.—The tenders were on the basis of 1,600 feet and the contract was on the basis of 1,800 feet for the channel span.

Mr. HOLGATE.—What comprised that contract? Were there plans and specifications attached?

Mr. HOARE.—You mean submitted by the Phœnix Bridge Company.

Mr. HOLGATE.—No, when that contract was made.

Mr. HOARE.—There were general specifications attached and a general outline plan showing the position of the piers, the rail level and the channel clearance to comply with the Government regulations.

Mr. HOLGATE.—Who drew these specifications?

Mr. HOARE.—I did.

Mr. HOLGATE.—Were they submitted to Mr. Cooper?

Mr. HOARE.—Yes.

Mr. HOLGATE.—And received his approval?

Mr. HOARE.—With modifications. There were some changes made later.

Mr. HOLGATE.—By Mr. Cooper?

Mr. HOARE.—Yes.

Mr. HOLGATE.—I am speaking now only of the specifications that were attached to the signed contract.

Mr. HOARE.—No, they were not changed. The only change in the original was in the figures representing the channel span.

Mr. HOLGATE.—Then these specifications were approved by Mr. Cooper?

Mr. HOARE.—No, not prior to that time. I do not remember any noted approval on these specifications. These specifications were approved by the Department of Railways and Canals earlier.

Mr. STUART.—I think the specifications were the same which were submitted to Mr. Cooper and his approval of them was contained in his recommendation that the tender should be accepted.

Mr. HOLGATE.—Were these specifications the same that were attached to Mr. Cooper's report on the tenders?

Mr. HOARE.—Yes, precisely.

Mr. HOLGATE.—Did those specifications cover the construction of a 1,600 foot bridge or an 1,800 foot bridge?

Mr. HOARE.—They applied to both.

Mr. HOLGATE.—How do you know?

Mr. HOARE.—The specifications as first drawn were for a 1,600 foot channel span. The advertisement calling for bids called for the 1,600 feet mentioned in the specification, but when the specification was embodied in the order in council—that is in connection with the subsidy contract—the same specification was used but an 1,800 foot span was referred to. They simply changed the figures from one channel span to

another. The same specification was used. There is no change in the clause of the specification. In other words, that specification was used for all documents until Mr. Cooper suggested certain modifications about the time the Phœnix Bridge Company's contract was going to be signed.

Mr. HOLGATE.—I am not clear in my mind yet, Mr. Hoare, that Mr. Cooper approved the specification that formed part of your contract with the Phœnix Bridge Company.

Mr. HOARE.—I do not think he actually signed these specifications.

Mr. STUART.—Probably his report might speak of them? If the same specifications formed part of the contract the report would speak of them, I think.

Mr. HOLGATE.—Perhaps at this point it would be fair to get Mr. Hoare to look at these papers. (Mr. Hoare examined Mr. Cooper's report.)

Mr. HOARE.—He refers to the specifications here. Those are the original specifications that were issued for tenders and attached to the subsidy contract. Those are the tenders referred to in this report. Those are the same specifications.

Mr. HOLGATE.—The specifications in the subsidy contract—are they the same specifications as were in the contract between the Quebec Bridge and Railway Company and the Phœnix Bridge Company?

Mr. HOARE.—Yes, the same thing.

Mr. HOLGATE.—Identically?

Mr. HOARE.—Yes.

Mr. HOLGATE.—What does Mr. Cooper say about that? This is his report of what date?

Mr. HOARE.—(Reading) 'Both the Keystone and Phœnix plans of cantilever superstructure are in accordance with specifications and are acceptable designs.' The specifications here referred to are the specifiations that were issued for tenders and the same which formed part of the subsidy contract. They were approved by the Department of Railways and Canals. Then, after that, when the Phœnix Bridge Company signed their contract, it was understood that limited modifications were to be made in these specifications and they were then from time to time as the work proceeded.

Mr. HOLGATE.—Was that contract made at that time with the Phœnix Bridge Company?

Mr. HOARE.—At the date of this report?

Mr. HOLGATE.—Yes.

Mr. HOARE.—No, a long time after that.

Mr. HOLGATE.—Was the contract made then before these alterations were suggested in the specifications?

Mr. HOARE.—Yes, to the best of my knowledge; as far as I can remember the contract was actually signed before the modifications were made. They were made immediately afterwards, but previous to any work actually being performed or any detail plans made by the Phœnix Bridge Company, the modifications were prepared and given to the Phœnix Bridge Company before they undertook any detailing work.

Mr. HOLGATE.—What bridge span did the contract call for?

Mr. HOARE.—An 1,800 foot channel span.

Mr. HOLGATE.—What were these changes that were made in that specification subsequent to the signing of the contract?

Mr. HOARE.—These modifications in the specification were made after the signing of the contract but previous to any detail plans being commenced or work commenced by the Phœnix Bridge Company. It was understood that modifications would be made and that they were not to proceed with the work until these modifications were outlined. There is a letter attached to the contract of the Phœnix Bridge Co., which will throw some light on that matter if you will just refer to it. (Exhibit No. 16.)

Prof. GALBRAITH.—Is that the letter to Mr. Parent?

Mr. HOARE.—Yes, signed by Mr. Reeves.

'As soon as the revised specifications have been furnished to us, approved by the government engineers.'

Mr. STUART.—What is the date of that letter?

Mr. HOLGATE.—June 19th, 1903.

Mr. HOARE.—That letter, I think, will enlighten you a little on that.

Mr. HOLGATE.—What were these revised specifications?

Prof. KERRY.—Do we understand that the Phœnix Bridge Company took a contract with specifications attached on an understanding that these specifications were to be altered by the representatives of the Quebec Bridge and Railway Co.?

Mr. HOARE.—Yes, that was the general understanding.

Prof. KERRY.—Is that expressed in writing clearly anywhere? I am familiar with Mr. Reeves' letter to Mr. Parent.

Mr. HOARE.—I am not positive about that.

Mr. HOLGATE.—Where can we secure the original of this specification that was attached to the contract and the plans that formed part of the contract?

Mr. HOARE.—They should be with the contract in the secretary's charge in the safe, but as shown this morning, they were disconnected.

Mr. HOLGATE.—We have asked the secretary and he does not know where they are. Where else could they be?

Mr. HOARE.—They might have got up to Ottawa by mistake. He sent a lot up there, and they may have got up with them. They will have to be traced up.

Mr. HOLGATE.—Can you give us any information?

Mr. HOARE.—I have not seen them for years. I have not seen them since I distributed these different plans and specifications calling for tenders and attached to the contract. I have never seen them since.

Prof. KERRY.—Were the plans and specifications attached to the contract duplicates of the general plan and specification sent out with the call for tenders?

Mr. HOARE.—Yes.

Mr. HOLGATE.—For your own use in connection with this work, Mr. Hoare, what documents had you?

Mr. HOARE.—The original and the amended specifications.

(Document filed and marked exhibit No. 21.)

Mr. HOLGATE.—You identify exhibit No. 21 as a copy of the specifications that were attached to the contract and also the copies of the amendments to the specifications that were afterwards inserted?

Mr. HOARE.—Yes.

Mr. HOLGATE.—In what way did the Phœnix Bridge Company assent to these modified specifications?

Mr. HOARE.—They agreed to accept these modifications, and I think Mr. Reeves' letter there refers to it. It is virtually an acceptance of them as well—that letter attached to the contract.

Mr. STUART.—May I see the letter?

Mr. HOLGATE.—Yes. I would like to know at this point whether——

Mr. STUART.—Whether we are agreed that these are the modified specifications?

Mr. HOLGATE.—Yes.

Mr. HOARE.—I am certain that is all; positive.

Mr. STUART.—Mr. Deans' impression is that that is all, but of course he would not like to speak of a matter of that importance without verifying it. I think we can be tolerably sure that Mr. Hoare is right when he says so.

Mr. HOLGATE.—Who prepared these amendments to the specifications that you refer to, exhibit 21?

Mr. HOARE.—Mr. Cooper.

Mr. HOLGATE.—Were these amendments approved by the government engineers?

Mr. HOARE.—Yes, sir.

Mr. HOLGATE.—What date was that, do you remember?

Mr. HOARE.—No, I cannot tell you now, but I think it must be in—there must be a letter or some reference to it in Mr. Barthe's exhibits; it must be covered by all these documents.

Prof. KERRY.—When and by whom was the advisability of these amendments suggested?

Mr. HOARE.—I could not give you the exact date when they were advised, but it was upon the advice of Mr. Cooper that these amendments were submitted to the Department of Railways and Canals for approval, which were accepted.

Prof. KERRY.—Mr. Cooper's suggestions will be in writing?

Mr. HOARE.—They should be, no doubt they are; no doubt there is a letter to that effect. I rather think there is some reference to that in those documents also, those exhibits of this morning.

Mr. HOLGATE.—Who was the representative of the Department of Railways and Canals, who would deal with the matter at that time?

Mr. HOARE.—Mr. Schreiber.

Mr. HOLGATE.—Mr. Collingwood Schreiber?

Mr. HOARE.—Yes.

Mr. HOLGATE.—Just look over that document (exhibit No. 17) and see if that gives you any light on the matter, Mr. Hoare?

Mr. HOARE.—This refers directly to those amendments. This is the communication that leads up to that. That is the report to sanction the amendments proposed there. (Extract from Order in Council, July 23, 1903.)

Mr. HOLGATE.—What gave rise, Mr. Hoare, to the suggestions made by Mr. Cooper for the modification of the original specification?

Mr. HOARE.—He considered general improvements were necessary.

Mr. HOLGATE.—He considered it?

Mr. HOARE.—Yes, he considered that some improvements were required and necessary in some clauses of the specifications before the details were commenced by the Phœnix Bridge Co. before they commenced their detailed plans.

Mr. HOLGATE.—Did he draw up the original specifications that were made a basis for the general competition?

Mr. HOARE.—No.

Mr. HOLGATE.—Who did?

Mr. HOARE.—I did. To explain the matter a little more fully, there were a few suggestions of my own in that specification, but the majority of the changes were his own. I do not know that I could give all the specified reasons; I know with regard to one of the clauses, for wind stresses, he thought mine were unnecessarily heavy in the original specification; he gave that as one reason, that I had provided for too heavy wind pressure.

Mr. HOLGATE.—Had you and Mr. Cooper conferences prior to June 2, 1903?

Mr. HOARE.—Yes, we had several.

Mr. HOLGATE.—And were Mr. Cooper's amendments to the specification the outcome of these conferences?

Mr. HOARE.—To a certain extent, not altogether.

Mr. HOLGATE.—And at that time Mr. Cooper was the official consulting engineer for your company?

Mr. HOARE.—Yes, sir.

Mr. HOLGATE.—And you submitted these questions to him? Was it necessary, in your opinion, to get his approval before they were put into contract form?

Mr. HOARE.—Yes.

Mr. HOLGATE.—And when these specifications were amended, were they final?

Mr. HOARE.—Yes, as far as original specifications are concerned, that is all that I have any knowledge of.

Mr. HOLGATE.—And were they accepted by the Phœnix Bridge Company as complete?

Mr. HOARE.—I imagine so; I heard nothing to the contrary.

Mr. HOLGATE.—If there had been anything to the contrary you would have known it?

Mr. HOARE.—Yes, most certainly.

Mr. HOLGATE.—Were there any further specifications in connection with the work made that would amend in any way these specifications?

Mr. HOARE.—Not to my knowledge.

Mr. HOLGATE.—I would like that a definite answer if you can make it.

Mr. HOARE.—Will you repeat the question?

Question read to witness as follows:—

'Were there any further specifications in connection with the work made that would amend in any way these specifications?'

Mr. HOARE.—I am only speaking from personal knowledge; I am not aware of any. We have none on record. I do not think it is possible, but——

Mr. HOLGATE.—There must have been a finality somewhere, where was it? Were these final?

Mr. HOARE.—Yes, those are final as far as written specifications go, as far as written specifications, written or printed specifications go.

Mr. HOLGATE.—That is Exhibit No. 21.

Mr. HOARE.—But Mr Cooper he always considered that he had the right to make any—probably they do not come under the head of specifications, but he had the right to make changes in detail from time to time as plans were submitted by the Phœnix Bridge Company; that hardly perhaps comes under that heading.

Mr. HOLGATE.—But as far as documentary evidence goes, this was the last?

Mr. HOARE.—That is the last.

Mr. HOLGATE.—I only referred to specifications.

Mr. HOARE.—That is the last.

Mr. HOLGATE.—And you feel sure in your own mind that this copy agrees with the one that was certified by the government engineer?

Mr. HOARE.—Yes, sir.

Mr. HOLGATE.—Now that was your connection with the contract, Mr. Hoare?

Mr. HOARE.—Yes, sir.

Mr. HOLGATE.—With regard to the carrying out of that contract what were your powers? Are your powers clearly defined in the contract?

Mr. HOARE.—In the contract with the Phœnix Bridge Company?

Mr. HOLGATE.—In the contract with the Phœnix Bridge Company?

Mr. HOARE.—Let me refer to it a minute, I have not read it for a long time. Yes, the specification governs my powers pretty well; it specifies——

Mr. HOLGATE.—You mean the contract specifies your powers?

Mr. HOARE.—Yes, the contract of the 19th of June.

Mr. HOLGATE.—Who is the engineer of the Quebec Bridge and Railway Company mentioned in this contract?

Mr. HOARE.—Myself.

Mr. HOLGATE.—And who is the consulting engineer?

Mr. HOARE.—Mr. Theodore Cooper.

Mr. HOLGATE.—And at the time that this was made who was the Deputy Minister and Chief Engineer of the Department of Railways and Canals?

Mr. HOARE.—Mr. Collingwood Schreiber.

Mr. HOLGATE.—Were there any duties that you had in connection with this contract, Mr. Hoare, outside of what are specified in the contract or does the contract fully cover them.

Mr. HOARE.—Oh, I think the contract, yes, I should say the contract fully covers them.

Mr. HOLGATE.—We would like to have you just give us a short description of the

organization that you used in the carrying out of this contract, beginning with your connection with Mr. Cooper as consulting engineer?

Mr. HOARE.—Mr. Cooper was consulting engineer, resident in New York.

Mr. HOLGATE.—Did he come here to consult you or did you go there to consult him.

Mr. HOARE.—I went there to consult him generally. You are speaking now in connection with the superstructure or the whole work?

Mr. HOLGATE.—Any time.

Mr. HOARE.—He came here during the construction of the foundations, he came here on two or three occasions. For the superstructure, I went to New York.

Mr. HOLGATE.—Do you remember the date of Mr. Cooper's last visit?

Mr. HOARE.—No, I do not at present. I can give it to you roughly, I think about three years ago, three or four years ago.

Mr. HOLGATE.—The last visit?

Mr. HOARE.—Yes, he was here on three occasions during the sinking of the caissons for the bridge foundation. I do not think he has been here since, but he received weekly reports.

Mr. HOLGATE.—You had a system of——

Mr. HOARE.—We had a system of weekly reports.

Mr. HOLGATE.—Who made these reports?

Mr. HOARE.—Mr. McLure.

Mr. HOLGATE.—Who is Mr. McLure?

Mr. HOARE.—Inspecting engineer on the erection.

Mr. HOLGATE.—By whom was he appointed?

Mr. HOARE.—Jointly, by mutual agreement between Mr. Cooper and myself.

Mr. HOLGATE.—To whom does he report?

Mr. HOARE.—Both of us, and Mr. Cooper's communication with the bridge was maintained through Mr. McLure's weekly reports.

Prof. KERRY.—What was your knowledge of Mr. McLure that made you make that selection, Mr. Hoare?

Mr. HOARE.—Previous to his engagement I could not find anybody suitable for that position and I left it entirely to Mr. Cooper. I left it entirely to him, and he nominated Mr. McLure to the position. I had previous authority from the Bridge Company to arrange personally or mutually with Mr. Cooper for any inspectors wanted for that work.

Prof. KERRY.—Then in the selection of Mr. McLure you felt that you had fully provided for all necessary inspection?

Mr. HOARE.—No, there are other inspectors besides. On the erection Mr. Kinloch was appointed.

Prof. KERRY.—But the appointment of Mr. McLure and Mr. Kinloch was your carrying out of the instructions or the commission of the board of directors to organize fully a competent inspection?

Mr. HOARE.—Yes.

Mr. HOLGATE.—Could you have dismissed Mr. McLure, Mr. Hoare?

Mr. HOARE.—I could have, but I would not have done it without coming to an agreement with Mr. Cooper.

Mr. HOLGATE.—Could Mr. Cooper have dismissed him without coming to an agreement with you?

Mr. HOARE.—No, I do not think he could, because he would not have done so. I do not think he would have done so, but it is doubtful whether he could.

Mr. HOLGATE.—You mentioned, I think, another name?

Mr. HOARE.—Mr. Kinloch, on the erection.

Mr. HOLGATE.—Now, would you tell us what Mr. McLure's duties were. You have already put it in the form of a letter dated September 7, 1907 (document produced, filed and marked as Exhibit No. 22) see if that correctly describes his duties?

Mr. HOARE.—Yes. In addition to what I have stated here, if there was anything of importance occurred he had always orders to telegraph immediately to Mr. Cooper for advice on any question of importance or emergency, in addition to what I have stated there, but that generally covers, I think, his duty.

Mr. HOLGATE.—Then does this letter also cover a description of Mr. Kinloch's duties?

Mr. HOARE.—Yes, I should have said to him or to me, but that substantially covers his duties.

Mr. HOLGATE.—'To Mr. McLure or to me.'

Mr. HOARE.—Yes, or to me.

Mr. HOLGATE.—Then I understand that you had some further inspectors at the works where the superstructure was fabricated?

Mr. HOARE.—Yes.

Mr. HOLGATE.—You might give us those names.

Mr. HOARE.—At Phœnixville Mr. Edwards and Mr. Meeser.

Mr. HOLGATE.—And their duties were what?

Mr. HOARE.—And Mr. Keenan. He was mill inspector at Harrisburg; and there were others employed from time to time as mill inspectors as required, and their services dispensed with when the work at that particular mill was completed. The only two of those inspectors employed at the present time are Mr. Edwards and Mr. Meeser. Mr. Edwards is chief inspector, and Mr. Meeser is his assistant. Their duties are, to inspect the shop work and mill work at Phœnixville. Beyond that Mr. Edwards duties are to keep strict account of the metal delivered from outside mills to be fabricated at the Phœnixville shops, and all metal shipped from there to Quebec; to make returns to me of the quantities of metal rolled, fabricated and shipped, at regular intervals. He had also to furnish me with detailed reports of all metal inspected at the mills as well as at the shops, also chemical tests of metal in the different melts at the scale works. Besides the ordinary specimen tests required from time to time they were instructed to make full size eye-bar tests to destruction. About two per cent of the total number of eye-bars in the structure were tested in this manner.

Mr. HOLGATE.—Are there full reports of all these tests in existence?

Mr. HOARE.—Yes.

Mr. HOLGATE.—Can they be produced here?

Mr. HOARE.—I can produce them.

Mr. HOLGATE.—Then we would require these two inspectors?

Mr. HOARE.—They will be here on Thursday, I sent for them.

Mr. HOLGATE.—Were these tests demanded by the contract?

Mr. HOARE.—Yes—no, demanded by the specifications more strictly speaking.

Mr. HOLGATE.—Well, of course by the specifications.

Mr. HOARE.—By the specifications, yes.

Mr. HOLGATE.—And were all these tests made in accordance with the demands of the specifications?

Mr. HOARE.—I think they were exceeded.

Mr. HOLGATE.—And were there tests made beyond what the specifications called for?

Mr. HOARE.—I think so. If any departure was made it was in excess of the requirement of the specification.

Mr. HOLGATE.—But we will get full details of that from the inspectors?

Mr. HOARE.—You will get full details of that from the inspectors.

Mr. HOLGATE.—Now, with regard to Mr. McLure, you state that Mr. McLure's duties were to thoroughly inspect all material which arrived at the storage yard from Phœnixville, before it was placed in the bridge, to check, with Mr. Birks, the dimensions of all members and to see that they were properly assembled according to erection plans before the erection foreman was allowed to place them in the bridge. Were these instructions, to your knowledge, carried out?

Mr. HOARE.—Yes, I believe they were thoroughly carried out in every particular.

Mr. HOLGATE.—Were these instructions given to Mr. McLure in writing?

Mr. HOARE.—I do not know that they were given in writing, word for word, to correspond with my letter, but he received very clear instructions from Mr. Cooper before he came here what his duties were.

Mr. HOLGATE.—Did you issue any instructions to Mr. McLure in writing?

Mr. HOARE.—No, sir, I considered Mr. Cooper's instructions quite sufficient.

Mr. HOLGATE.—Did you see the instructions, Mr. Hoare, that Mr. McLure received from Mr. Cooper?

Mr. HOARE.—Yes, sir, when he first came here I saw them.

Mr. HOLGATE.—There was a letter of instructions that Mr. McLure got from Mr. Cooper?

Mr. HOARE.—Yes, sir, and he showed it to me immediately on arrival.

Mr. HOLGATE.—In your opinion, Mr. Hoare, was it an important step to inspect all metal which arrived at the storage yard?

Mr. HOARE.—Yes, very.

Mr. HOLGATE.—Very important?

Mr. HOARE.—Yes.

Mr. HOLGATE.—And you are quite sure that the inspection was carried out?

Mr. HOARE.—I am positive that those two gentlemen thoroughly carried out their instructions and duties in that respect.

Mr. HOLGATE.—Would this apply both to Mr. McLure and Mr. Kinloch?

Mr. HOARE.—Both, to both of them.

Mr. HOLGATE.—Then Mr. McLure, according to your understanding, Mr. Hoare had to, as part if his duty, check, with Mr. Birks, the dimensions of all members?

Mr. HOARE.—Yes.

Mr. HOLGATE.—Where would that be done?

Mr. HOARE.—Generally speaking, before the metal is taken off the cars on the bridge. I said before the metal was lifted off the cars on the bridge to put it into position.

Mr. HOLGATE.—And that differs from his other inspection, which was, you understand, made in the yard?

Mr. HOARE.—Oh, they used to inspect at both places as necessity required, inspected the metal at both places, one or other of them would inspect the metal at both places.

Mr. HOLGATE.—But it was your understanding that the rule was all that should be inspected on arrival at the storage yard?

Mr. HOARE.—They possibly would not inspect every piece of metal, but every important piece of metal would be looked over on arrival to see if it had sustained any damage during transportation. The final inspection was made on the cars prior to the metal being hoisted into position, and they also checked over—not only inspected the metal to look out for defects, but to check with the erection plans to see that the proper members were assembled correctly, to see that the members were correctly assembled.

Mr. HOLGATE.—In all these matters, Mr. Hoare, are you speaking from your positive personal knowledge of what was done?

Mr. HOARE.—Personal knowledge.

Mr. HOLGATE.—Not simply from what instructions you gave, or someone else gave, of what was done?

Mr. HOARE.—Personal knowledge, what I know myself.

Prof. KERRY.—Do I understand that the dimensions of the members were actually checked by Mr. Birks and Mr. McLure together?

Mr. HOARE.—On the cars, yes.

Prof. KERRY.—On the cars?

Mr. HOARE.—Finally, before they were lifted into position.

Prof. KERRY.—That was the regulation practice?

Mr. HOARE.—Yes.

Mr. HOLGATE.—Who would order the parts forward from the yard to the bridge?

Mr. HOARE.—The foreman of erection.

Mr. HOLGATE.—Of the Phœnix Bridge Company?

Mr. HOARE.—The Phœnix Bridge Company's foreman of erection would call for members in the yard as he required them.

Mr. HOLGATE.—But according to your system that would already have been inspected by the Quebec Bridge Company's inspector.

Mr. HOARE.—Yes, and then inspected again at the bridge before the members were lifted to position.

Mr. HOLGATE.—Mr. Kinloch then was appointed by yourself?

Mr. HOARE.—Yes, sir.

Mr. HOLGATE.—And responsible to you?

Mr. HOARE.—Yes, sir.

Mr. HOLGATE.—To you only?

Mr. HOARE.—To me only.

Mr. HOLGATE.—What was his relation then with Mr. McLure?

Mr. HOARE.—He assisted, he worked with Mr. McLure, inspecting mechanical parts of the bridge, riveted and so forth.

Mr. HOLGATE.—Mr. McLure's inspection then was more general than Mr. Kinloch's?

Mr. HOARE.—A little more general and his work was more technical and clerical. He had to look after technical questions that arose from time to time.

Mr. HOLGATE.—Was Mr. Kinloch's work principally on details?

Mr. HOARE.—Yes, detailed work; that is inspecting the metal generally before it went into the work, joints, riveting, bolting and so forth.

Mr. HOLGATE.—Under whose instructions would he work?

Mr. HOARE.—I gave him instructions from time to time and he always conferred with Mr. McLure, worked with him in fact and conferred with him from time to time, and if he discovered anything unnatural, anything out of the common, he would always mention it to Mr. McLure, and he would report the matter to myself and Mr. Cooper, and make his record of same. Mr. McLure kept all the records of the work, that is the daily diary of what occurred during a season's work.

Mr. HOLGATE.—Then, did Mr. Kinloch report to Mr. McLure?

Mr. HOARE.—Yes, they did not work independently. Anything he discovered in the work that Mr. McLure did not see, the first thing he would do would be to report to Mr. McLure, so it would be recorded and then it would come to me through Mr. McLure and to Mr. Cooper if necessary, to the Phœnix Bridge Company.

Mr. HOLGATE.—Through you to Mr. Cooper or through Mr. McLure to Mr. Cooper?

Mr. HOARE.—No, Mr. McLure had instructions to report direct to Mr. Cooper.

Mr. HOLGATE.—What information in the way of specifications or drawings had Mr. Kinloch to guide him in his inspection?

Mr. HOARE.—They had in their office at the bridge site exact duplicates of all erection and shop plans that were sent down from Phœnixville, and the shop plans corresponded with the approved plans by Mr. Cooper.

Mr. HOLGATE.—Were there any instructions outside of those that were issued?

Mr. HOARE.—Yes, the erection department at Phœnixville issued booklets of instructions to their foreman how to proceed in the erection of each member in the structure.

Mr. HOLGATE.—Were these instructions or blue prints approved by Mr. Cooper or yourself?

Mr. HOARE.—Not by me. Whether they were referred to Mr. Cooper or not I am not sure, but I hardly think so. He may have been consulted on the general methods of erection but I do not think each page of instructions was submitted to him.

Mr. HOLGATE.—If they had not been approved by Mr. Cooper then was Mr. Kinloch working under these detailed instructions issued by the Phœnix Bridge Company?

Mr. HOARE.—No, he did not work under the booklet instructions. They assumed the responsibility of all that themselves. Mr. Kinloch simply inspected the metal that was being placed in the bridge from time to time to take note of the fit of any joint. If any metal was defective or bent or there had been any damage it would be his duty to see that it was put in proper condition before it was finally hoisted into position in the bridge.

Mr. HOLGATE.—Had Mr. Kinloch power to have the work done in manner contrary to the methods illustrated by these blue printed instructions issued by the Phœnix Bridge Company?

Mr. HOARE.—No, sir.

Mr. HOLGATE.—Then he was bound by their instructions?

Mr. HOARE.—Well, not altogether. I said before that they would take the responsibility of their methods and procedure. Mr. Kinloch did not interfere with them unless he saw anything that was risky. If he had discovered any procedure that was risky he would have conferred with Mr. McLure and then it would have been reported from there, but no such reports have ever been made. Mr. Kinloch's duties were more mechanical, to see that there were no defects in the work or the members of the bridge, that the joints were properly bolted up. When they were riveted he had to attend to see that the bolts were properly taken out and replaced by rivets.

Mr. HOLGATE.—When you say properly taken out and replaced by rivets, does that mean that he was following out the instuctions of these blue prints, or was it left to his discretion?

Mr. HOARE.—His own proceedings were left more or less to his own discretion; that is as to where he should go on the bridge and what he should do.

Mr. HOLGATE.—I quite see that, but take the question of bolting up of a large connection, we will say one of the principal connections, would Mr. Kinloch tell the contractors how to do it, or would he simply see that they followed their own plan as shown in that blue print?

Mr. HOARE.—In these booklets there were certain instructions about bolting up joints. Until it was prepared to be riveted they had certain instructions about bolting up a joint fully or not with certain sizes of bolts. If that were not done he would call somebody's attention to it.

Mr. HOLGATE.—Were you satisfied, Mr. Hoare, with the instructions that were given on those blue prints?

Mr. HOARE.—Yes, I was perfectly satisfied.

Mr. HOLGATE.—And you would have been satisfied if Mr. Kinloch had carried out those instructions?

Mr. HOARE.—Yes. He was not under the instructions of the Phœnix Bridge Company.

Mr. HOLGATE.—I quite understand that, but it is the programme that was followed that we desire to understand.

Mr. HOARE.—I never heard any objection being made to the course laid down in these booklets. There might be some minor objections that occurred from time to time, but they did not consider it worth mentioning. I do not say that there were no objections made from time to time, but there was nothing of any importance occurred to the best of my knowledge.

Mr. HOLGATE.—If Mr. Kinloch followed out the directions and instructions given by the Phœnix Bridge Company on these blue prints to their erection foreman, you would have been satisfied?

Mr. HOARE.—As far as I know.

Mr. HOLGATE.—Had Mr. McLure the power to dismiss any employee of the Phœnix Bridge Company?

Mr. HOARE.—No, sir.

Mr. HOLGATE.—Had Mr. Kinloch that power?

Mr. HOARE.—No, sir.

Mr. HOLGATE.—Had you that power, Mr. Hoare?

Mr. HOARE.—No, sir.

Mr. HOLGATE.—Was there any power vested in Mr. Cooper?

Mr. HOARE.—No.

Mr. HOLGATE.—Had any of the officers of the Quebec Bridge Company power to stop the work of the Phœnix Bridge Company?

Mr. HOARE.—Any of the officers?

Mr. HOLGATE.—Either Mr. Cooper, yourself, McLure, or Kinloch?

Mr. HOARE.—To stop the work?

Mr. HOLGATE.—To stop the work of the Phœnix Bridge Company?

Mr. HOARE.—I do not know that there is anything in the contract which would give us any such power.

Mr. HOLGATE.—Will you say now that at the present time you cannot answer that?

Mr. HOARE.—Will you give me a minute, I will just see.

Mr. HOLGATE.—It is a question that requires very careful consideration.

Mr. HOARE.—I want to read over the contract to see whether there is any power vested in the contract. (Mr. Hoare read over the contract). There is nothing in the contract.

Mr. HOLGATE.—What is your own understanding?

Mr. HOARE.—We have got no power in the contract.

Mr. HOLGATE.—After reading the contract now, you conclude you have no power?

Mr. HOARE.—There is no power in the contract itself, no clause in the contract giving anybody connected with the company power to stop the work.

Prof. KERRY.—Had you ever considered previously, Mr. Hoare, whether you had such power?

Mr. HOARE.—No, I never considered the question at all.

Mr. HOLGATE.—Then, do I understand that this is the first time you have considered that question?

Mr. HOARE.—Yes.

Witness retired.

Commission adjourned until to-morrow morning at ten o'clock.

FOURTH DAY.

QUEBEC, THURSDAY, September 12, 1907.

The Commission resumed at ten a.m.

ULRIC BARTHE, recalled.

Mr. Barthe filed ten letters which were marked exhibit No. 23.

Prof. GALBRAITH.—Is this complete in respect to Mr. Cooper, Mr. Barthe?

Mr. BARTHE.—Yes.

Prof. GALBRAITH.—In reference to his appointment?

Mr. BARTHE.—Yes, I do not see any more. I have added one which I found yesterday—the last one in November. They cover all about the appointment of Mr. Cooper.

Witness retired.

EDWARD A. HOARE, recalled.

Mr. HOLGATE.—Mr. Hoare, will you recall the last part of your examination of yesterday? Have you any explanation you would like to make in connection with it? That referred to your power as chief engineer of the Quebec Bridge Company; you gave us the impression yesterday that you had no power to stop the work of the Phœnix Bridge Company, and you told us before that that you could not dismiss any men in the employ of the Phœnix Bridge Company.

Mr. HOARE.—I would like that statement in reference to the question of stopping the work qualified as under, and the following statement substituted: Notwithstanding that the contract does not refer to any power vested in the engineers for stopping the work at any time, I can say that if any serious question arose affecting the structure, or if there was serious damage to any part of the structure, under such circumstances I would stop the work.

Mr. HOLGATE.—You kept a diary, I suppose, of that work, Mr. Hoare?

Mr. HOARE.—Yes. The diary was kept daily by the inspectors and Mr. McLure in the field and returned to the office regularly.

Mr. HOLGATE.—Was that diary in the form of an ordinary diary, or ———?

Mr. HOARE.—It was just a daily record of everything that happened on the bridge.

Mr. HOLGATE.———or was it on a set form?

Mr. HOARE.—No set form.

Mr. HOLGATE.—The diary was in addition to the forms that were made out of daily progress?

Mr. HOARE.—Yes. I can produce that book if you wish.

Mr. HOLGATE.—Did you keep the diary?

Mr. HOARE.—No, Mr. McLure entered up every day's proceedings for me and returned the book to the office.

Mr. HOLGATE.—What record did you personally keep?

Mr. HOARE.—I kept no pocket diary apart from that except certain dates I visited the work.

Mr. HOLGATE.—Then you have a record of the times that you were present yourself at the work?

Mr. HOARE.—I do not say I noted every day I went there, but the majority of the visits I noted in my diary. There was not a day that I did not telephone and talk to them at the work. If I was not able to make personal visits I always called them on the 'phone during the day to ascertain actual facts in connection with progress.

Mr. HOLGATE.—Had you other duties to attend to, Mr. Hoare, besides the work in connection with the Quebec bridge?

Mr. HOARE.—Yes.

Mr. HOLGATE.—What were they, since 1905?

Mr. HOARE.—It was only during the last two years that I had charge of the viaduct across the Cap Rouge river.

Mr. HOLGATE.—Was there any other work?

Mr. HOARE.—Not since the construction of the bridge commenced. I had work before the construction commenced. During the time the surveys were in progress I had other work, but that is before my permanent appointment.

Mr. HOLGATE.—Since 1905 the only other work you have had was the Cap Rouge viaduct.

Mr. HOARE.—That is all.

Mr. HOLGATE.—Did that include any railway construction?

Mr. HOARE.—No, only the bridge itself.

Mr. HOLGATE.—What proportion of your time then would have been taken up by the Quebec bridge and what proportion by the other work?

Mr. HOARE.—That is for the last two years?

Mr. HOLGATE.—Yes.

Mr. HOARE.—It is rather hard to say precisely. I should think three-quarters of the time on the Quebec bridge. I attended to both, as a matter of fact, at the same time. They were so conveniently situated to each other that I could attend to both.

Mr. HOLGATE. What was the relative importance of the two works?

Mr. HOARE.—The Quebec bridge, of course, was far the most important.

Mr. HOLGATE.—Just give us an idea of your visits to Quebec bridge in the way of inspection, and the instructions that you would give on the work.

Mr. HOARE.—As a rule, I spent, whenever I visited the site, most of the day there, conferred with the inspectors as to what was going on, made a general inspection myself, asked them questions about materials. A question I asked was if everything was all right, or if anything unusual has occurred. Then I would go over the structure with them and go to the office. They would explain anything that was happening during the day in detail, and when the members were being erected I would ask them if all connections were right and precautions taken for securing everything as the work went on. They used to answer all these questions, refer to the plans of the work in progress and point out anything I asked. I used to inquire about the condition of the surface of the metal where it was in contact, where there were splices occurring to see that it was properly protected from the weather, and so forth.

Mr. HOLGATE.—In these inspections would you be accompanied by some men on the work and who would they be?

Mr. HOARE.—Just Mr. McLure and Mr. Kinloch.

Mr. HOLGATE.—What about Mr. Birks?

Mr. HOARE.—He would be present sometimes. It was not his business to attend to me when I arrived on the work. He would accidentally appear on the scene. I used to have conversations with him occasionally on the condition of the work incidentally. If there were anything specially occurring, Mr. Birks would be called into conference. There was very seldom any necessity for any special consultation of that kind.

Mr. HOLGATE.—Or with Mr. Yenser?

Mr. HOARE.—I used to talk with him every day I went down and asked him how he was getting along, and if he had come up against any difficulties, &c.—general conversation about the erection, if everything was going to his satisfaction. The answer generally was, 'We are getting along finely.' That was his general answer to my question.

Mr. HOLGATE.—Were you familiar with the scheme of erection that the Phœnix Bridge Company were operating under?

Mr. HOARE.—Yes. I did not follow every little detail in connection with the operations, but I was acquainted with their instructions, which were in a certain booklet.

Mr. HOLGATE.—Can you say that the instructions that were issued by the Phœnix Bridge Company were, to the best of your knowledge, carried out on the works?

Mr. HOARE.—Yes, I have no reason to know to the contrary.

Mr. HOLGATE.—Who prepared the monthly estimates?

Mr. HOARE.—I did.

Mr. HOLGATE.—We would like you to file all these estimates, Mr. Hoare. We would like too, Mr. Hoare, if you would go over your diary and give us a short memorandum of the occasions of your visits to the bridge since the spring of 1905. With regard to other inspections you made, Mr. Hoare, of the work before it reached the bridge, what have you to say?

Mr. HOARE.—I made personal inspections of the work in progress at Phœnixville several times a year to see that everything was going on properly, to give the inspectors instructions about anything that might turn up from time to time, and also to see that the weights of metal were being properly estimated and checked by different methods.

Mr. HOLGATE.—This took considerable time, I suppose?

Mr. HOARE.—Yes, all this work went on for several years. This process extended over several years.

Mr. HOLGATE.—On these occasions would you meet Mr. Edwards and Mr.——?

Mr. HOARE.—I used to meet all the inspectors, Edwards and Meeser, except the metal inspectors, who were at a distance, at Bethlehem, Harrisburg and Pittsburg. The inspectors also had orders to confer with Mr. Cooper immediately if any doubtful question arose in the tests.

Mr. HOLGATE.—In regard to the question of the inspection of material on its arrival at the bridge site, have you anything further to say?

Mr. HOARE.—Yes, I want it to be clearly understood that the final and most important inspection on the works took place on the bridge itself. An inspection at the storage yard was also made as occasion required more especially to ascertain if any damage to the metal had occurred during transportation. There were minor repairs occasionally required, and that was generally done at the storage yard. That was the object of the storage yard inspection. My evidence probably was not quite clear in that respect.

Mr. HOLGATE.—Well, Mr. Hoare, can you show us that there was a written scheme of inspection, or of organization, or directions, which would demand that course that you now say was the intention?

Mr. HOARE.—No, I do not think there are any written instructions, but that course was thoroughly understood by the inspectors on the work. There is no question about that.

Mr. HOLGATE.—But they were never instructed?

Mr. HOARE.—I do not think they were instructed precisely in writing to that effect, but they thoroughly understood their duties in that respect.

Mr. HOLGATE.—So far as the respective authority of Mr. Cooper and of yourself on the one side, and of the Phœnix Bridge Company's engineers on the other, were there any instructions or directions to be found outside of the written contract and correspondence?

Mr. HOARE.—I think only in one instance; there was a letter of instructions given by Mr. Cooper to Mr. McLure concerning the information that he wanted sent to him direct.

Mr. STUART.—By Mr. Cooper?

Mr. HOARE.—Yes, that is the only one I remember at the time.

Mr. HOLGATE.—I will repeat the question. (Question repeated.)

Mr. HOARE.—Not to my knowledge.

Mr. HOLGATE.—Were the original specifications sufficient as a basis for comparing tenders?

Mr. HOARE.—Yes.

Mr. HOLGATE.—Then, modifications were found necessary in these specifications?

Mr. HOARE.—Yes.

Mr. HOLGATE.—For what particular reasons? Were the modifications in order that they might comply with conditions that had not been previously considered?

Mr. HOARE.—Yes, to comply more closely with actual conditions of live loads and wind loads and some change in formula to provide for excessive dead loads. These were the principal reasons requiring the modifications as far as I can remember.

Mr. HOLGATE.—Would these modifications increase or decrease the cost of the work?

Mr. HOARE.—I do not think it would make much difference. I think the provision for wind was reduced and the provision for live loads increased. I do not believe the result would be much difference in the weight of metal; if anything, probably it would be increased.

Mr. HOLGATE.—Who, on the works, took care of the wind records?

Mr. HOARE.—There was an automatic register, an ananometer.

Mr. HOLGATE.—In charge of ?

Mr. HOARE.—The Phœnix Bridge Company.

Mr. STUART.—Mr. Cudworth took charge of that.

Mr. HOLGATE.—We want these wind records for this season.

Mr. DEANS.—We have a full record of them taken automatically by an electrical arrangement. We will furnish them.

Mr. HOARE.—My daily erection records show the daily wind records as well.

Mr. HOLGATE.—We have asked Mr. McLure for copies of all these daily reports. Are those the reports that you referred to?

Mr. HOARE.—They are the same as I have—identically the same.

Mr. HOLGATE.—There are quite a number of things we want you to take down. Will you make a memorandum of them ?

Mr. HOARE.—Yes.

Mr. HOLGATE.—There are the monthly estimates.

Mr. HOARE.—Certified copies ?

Mr. HOLGATE.—Yes.

Mr. HOLGATE.—A memo. of your various visits to the bridge.

Mr. HOARE.—Since the season of 1905 ?

Mr. HOLGATE.—Since the spring of 1905.

Mr. HOARE.—Is that all?

Mr. HOLGATE.—We would like you to let us have the copies of the resolutions of your board in connection with your appointment and if your duties were defined in writing we would like to have a copy of that document, or you might let us know now if they were defined in writing ?

Mr. HOARE.—No, they were not.

Mr. HOLGATE.—The position that you occupied, Mr. Hoare, we understand, was that of chief engineer ?

Mr. HOARE.—Yes.

Mr. HOLGATE.—Of course, we have our own ideas with regard to the powers and duties of a chief engineer on works and our interpretation of that title generally would be that the chief engineer was the absolute authority on that work, that he would have power to reject material if he did not approve of it, that he would have power to dismiss any employee of the contractors that he considered was incompetent, or was doing work improperly, or was misbehaving himself on the work, and that he would have power over the whole work to the extent of stopping any portion of the work during its progress, or the whole of the work, if, in his opinion, it was not being carried on entirely to his satisfaction, having in mind the letter and the spirit of the contract, the specification and the plans. Now, with that definition, would your position correspond with its duties ?

Mr. HOARE.—Yes, sir.

Mr. HOLGATE.—Then who was primarily responsible for the specifications?

Mr. HOARE.—The original?

Mr. HOLGATE.—The specifications under which the work was carried out.

Mr. HOARE.—I was primarily responsible for the original, and, for the modifications, Mr. Cooper—responsible for the changes.

Prof. KERRY.—Was any reference to you necessary on the part of Mr. Cooper, or was Mr. Cooper the absolute authority?

Mr. HOARE.—He had absolute authority to deal with the question.

Prof. KERRY.—In that respect, then, Mr. Cooper was the chief engineer of the bridge?

Mr. HOARE.—No, sir, he was consulting engineer and his appointment as consulting engineer gave him power to make these changes.

Prof. KERRY.—That is to say, his appointment delegated part of the authority of the chief engineer to him.

Mr. HOARE.—That is right.

Mr. HOLGATE.—Who was responsible then, primarily, for the plans?

Mr. HOARE.—The working plans, the structural plans the bridge is built on?

Mr. HOLGATE.—The plans on which the bridge was built.

Mr. HOARE.—In the first place they were made by the Phœnix Bridge Company?

Mr. HOLGATE.—Designed——

Mr. HOARE.—Designed by the Phœnix Bridge Company, submitted to Mr. Cooper as consulting engineer for his approval, finally sent to the Department of Railways and Canals in Ottawa for approval; after the stated approvals had been obtained the plans were returned to the Phœnix Bridge Company duly certified for construction purposes. It was my duty to see that these plans were approved by the Dominion Government and returned to the Phœnix Bridge Company.

Mr. HOLGATE.—Did you yourself approve the plans?

Mr. HOARE.—No, sir.

Prof. KERRY.—To make it clear, the power to reject those plans was vested first in Mr. Cooper and secondly in the chief engineer of the Department of Railways and Canals.

Mr. HOARE.—Yes, sir, precisely.

Prof. KERRY.—And you are personally aware that all plans were approved by the chief engineer of the Department of Railways and Canals.

Mr. HOARE.—Yes.

Mr. HOLGATE.—Were the original specifications discussed between you and Mr. Cooper before the tenders were called for?

Mr. HOARE.—No, sir.

Prof. KERRY.—Were those specifications based on any of the well known standard specifications?

Mr. HOARE.—Yes, sir.

Prof. KERRY.—On which of them?

Mr. HOARE.—I cannot at the moment state definitely now, but they were based on other standard specifications.

Prof. KERRY.—So they did not follow, for instance, the standard specifications in the Department of Railways and Canals, or any one specification probably.

Mr. HOARE.—In some respects, in some respects.

Mr. HOLGATE.—Who prepared these specifications?

Mr. HOARE.—Myself.

Mr. HOLGATE.—Then was the same course taken with regard to the general plan at that time, was it discussed between yourself——

Mr. HOARE.—Yes, sir.

Mr. HOLGATE.—Was it discussed between yourself and Mr. Cooper before tenders were called for?

Mr. HOARE.—No.

Mr. HOLGATE.—And that preliminary general plan was prepared by yourself?

Mr. HOARE.—Yes.

Mr. HOLGATE.—Then the working plans, Mr. Hoare, were the plans of the Phœnix Bridge Company?

Mr. HOARE.—Yes, sir, made and designed by them.

Mr. HOLGATE.—Approved by Mr. Cooper?

Mr. HOARE.—Yes, sir.

Mr. HOLGATE.—And by the Department of Railways and Canals?

Mr. HOARE.—Yes.

Mr. HOLGATE.—And were they approved by you?

Mr. HOARE.—No.

Mr. HOLGATE.—Then as to the fabrication of the material in the works of the contractor, who was responsible for that in so far as the Quebec Bridge Company is concerned?

Mr. HOARE.—Myself.

Prof. KERRY.—Could you define accurately, Mr. Hoare, in the case of that inspection of material in fabrication the position of Mr. Cooper? We understand from a letter filed with the commission here from Mr. Cooper (being part of exhibit No. 23), dated November 26, 1900, that his services were retained as consulting engineer and for supervising all required inspection. And we also understand from your evidence that any important point that came up with regard to shop inspection was to be directly reported to Mr. Cooper?

Mr. HOARE.—Yes.

Prof. KERRY.—Then Mr. Cooper's decision on these matters was final?

Mr. HOARE.—Always final, that was, he was within reasonable distance of the Phœnix works, and the inspectors all had instructions when anything occurred of any importance that they were to confer with Mr. Cooper immediately.

Prof. KERRY.—The inspectors then would be appointed by yourself?

Mr. HOARE.—Yes, they were all appointed by myself. Mr. Cooper and I had mutual arrangement about all these matters. Some I appointed and some he appointed, because I could not find suitable men, and when I could not find a suitable man for a certain purpose I asked him to find one. Arrangements of this kind were mutually agreed to.

Prof. KERRY.—And the Quebec Bridge Company relied on the services of those inspectors, under the guidance of Mr. Cooper, for satisfactory material?

Mr. HOARE.—Yes, and myself as well, I share in the responsibility of that inspection.

Prof. KERRY.—That is to say the inspectors reported both to Mr. Cooper and yourself?

Mr. HOARE.—The inspectors reported to both.

Prof. KERRY.—It was a divided responsibility?

Mr. HOARE.—It was a divided responsibility.

Prof. KERRY.—And would there be any differences of opinion arise in a case of that sort?

Mr. HOARE.—No, nothing occurred of the kind.

Prof. KERRY.—That is to say that when Mr. Cooper finally expressed an opinion it was accepted.

Mr. HOARE.—It was final.

Mr. HOLGATE.—You have the reports of the inspectors?

Mr. HOARE.—Yes, all the inspectors' reports were sent to me regularly?

Mr. HOLGATE.—I understand the inspectors are coming here?

Mr. HOARE.—They are to be here to-morrow.

Mr. HOLGATE.—Are all the documents showing the inspection here in Quebec, so that they will be able to produce them?

Mr. HOARE.—Yes, sir.

Mr. HOLGATE.—Are they in your possession now?

Mr. HOARE.—I have one set and the inspectors are bringing their own themselves. They are instructed to bring all the documents bearing on the inspection from the start.

Mr. HOLGATE.—In order that there may be no mistake about those reports we would like you to put them all together, your own reports?

Mr. HOARE.—Yes, I have mine all ready.

Mr. HOLGATE.—Now then, following out this question of responsibility, we have come to the fabrication, now we come to the erection. Who was primarily responsible for the erection?

Mr. HOARE.—The Phœnix Bridge Company.

Mr. HOLGATE.—Then where was your responsibility with regard to the erection?

Mr. HOARE.—My duty was to see that my inspectors attended to their duties, and that all precautions were taken in the conduct of the work.

Prof. KERRY.—To make that clear, Mr. Hoare, the erection plans were prepared by the Phœnix Bridge Company.

Mr. HOARE.—Yes.

Prof. KERRY.—They were under no necessity to submit those plans to anyone?

Mr. HOARE.—No, as a matter of fact they consulted Mr. Cooper.

Prof. KERRY.—They consulted as a matter of fact with Mr. Cooper?

Mr. HOARE.—As a matter of fact, as a matter of precaution, just to get his ideas on the methods adopted, but they had no obligation on their part to submit those plans.

Prof. KERRY.—What member or members of the staff of the Quebec Bridge Company was thoroughly conversant personally with those erection plans?

Mr. HOARE.—The inspectors on the work. It was their duty to be thoroughly conversant with those plans.

Prof. GALBRAITH.—Did I understand you to say that the erection plans had to be submitted to Mr. Cooper?

Mr. HOARE.—There was nothing obligatory.

Prof. GALBRAITH.—Or that they were?

Mr. HOARE.—But the Phœnix Bridge engineers made a practice of conferring with Mr. Cooper on certain methods adopted for erection.

Prof. GALBRAITH.—You know that through Mr. Cooper?

Mr. HOARE.—I simply know it by hearsay when I was at Phœnixville.

Prof. GALBRAITH.—But they were not bound in any way to do so?

Mr. HOARE.—No, not to my knowledge, there is no contract obligation.

Prof. KERRY.—What precautions were taken, Mr. Hoare, to ensure that the inspectors had a full file of these erection plans and to make sure that they were fully conversant with them?

Mr. HOARE.—I made personal application to the Phœnix Bridge Company to supply the Quebec Bridge Company with erection plans, that is to supply the office on the works with all the erection plans, that whenever they sent plans to their men they should send us duplicates of the same and whenever those plans did not arrive punctually, when they were in arrears, Mr. McLure used to call my attention to it, and we would call the attention of the Phœnix Bridge Company's engineer to that fact and request that those plans be immediately supplied.

Prof. KERRY.—And in so far as the detail of these erection plans is concerned, the knowledge of that detail, you depended on your inspectors?

Mr. HOARE.—The details, you mean the plans upon which——

Prof. KERRY.—Upon which they were erected.

Mr. HOARE.—The different travellers and hoisting machines were constructed upon?

Prof. KERRY.—The whole mass of plans involving a complete understanding of the way in which the bridge was to be erected.

Mr. HOARE.—We did not investigate the details of any of the erection plant, that was left entirely to the Phœnix Bridge Company, and they, as I said before, conferred with Mr. Cooper, consulted him on the methods adopted, the general principles, which I believe he thought was satisfactory. That is, to the best of my knowledge he thought they were quite satisfactory.

Prof. KERRY.—Then would it be correct to say on the part of the Quebec Bridge Company that it took the ground that it was not concerned in the methods of erection adopted by the Phœnix Bridge Company, that the Bridge Company under contract took the full responsibility for these erection methods?

Mr. HOARE.—Yes, that was the——

Prof. KERRY.—That is a correct statement of the position?

Mr. HOARE.—That is a correct statement of the position, I think.

Prof. KERRY.—Do you know personally whether Mr. Cooper interfered with the erection plans of the Phœnix Bridge Company in any way?

Mr. HOARE.—Not to my knowledge.

Prof. KERRY.—Or did he approve them?

Mr. HOARE.—No, sir, not officially.

Prof. KERRY.—Or unofficially, simply to your own knowledge?

Mr. HOARE.—I do not know, I cannot say that he even approved of them unofficially. All I can state positively is that the Phœnix Bridge Company's engineer conferred with him from time to time on their methods of erection, which I always understood he approved, but not in any official manner; he took no responsibility in the matter nor was he called upon to. In fact the entire responsibility rested with the Phœnix Bridge Company under their contract with the Quebec Bridge Company in that respect.

Prof. KERRY.—Now, I do not see under that situation, Mr. Hoare, what the inspectors of the Quebec Bridge Company were doing with regard to the erection, if the responsibility was entirely on the Phœnix Bridge Company, and the inspectors of the Quebec Bridge Company only saw that the instructions prepared by the Phœnix Bridge Company were properly carried out by its own employees. They would seem to have been acting almost as inspectors for the Phœnix Bridge Company.

Mr. HOARE.—No, their duties were to inspect metal as it arrived, to see that it was in proper condition before going to the bridge site from the storage yard. They had to check over the different members with the plans to see that they were properly assembled and that each member was going to its proper position in the bridge. A great many of them, for instance, the large clusters of eye-bars, some of these eye-bars were so much alike that it was very easy, without careful inspection, to get the wrong eye-bars grouped in. All that work had to be carefully inspected, recorded, noted and permission given to the foremen to place those members in position. They had also to see that there were no misfits, to see that the proper spliced plates were attached, to see that the pins fitted, that the proper pins went into their right position, and to see that there was no inaccuracy in the bearings of the compression members—in fact to look out for any defects that might occur, that might have escaped the shop or occurred in transit. In several cases there were little shop errors discovered by our own inspectors, not important, trifling, many of them, but at the same time they were all recorded and trifling remedies had to be made, before some members could be connected. They had to see that the joints were properly bolted up until the riveting commenced, look after the riveting work, pass on every joint and every rivet.

Prof. KERRY.—Throughout that work they were proceeding in accordance with the plans prepared by the Phœnix Bridge Company and not approved or submitted to the Quebec Bridge Company?

Mr. HOARE.—They were submitted and approved by the consulting engineer and the Dominion engineer at Ottawa.

Prof. KERRY.—That is so far as the dimensions of the members are concerned, but not so far as concerns the detail of erection in any way.

Mr. HOARE.—Yes, that covered all the permanent members that went into the bridge. The approval, the certificate by the consulting engineers, and the government engineer covered every structural plan on the work, but the plans for travellers and hoisting machinery were not submitted to anybody for approval.

Prof. GALBRAITH.—If in the preliminary bolting up of spliced plates, you were not satisfied with the number and size specified in erection blue prints, did you consider it your duty to interfere?

Mr. HOARE.—Well, if I had been aware of it I should have interfered, but I have never been aware of any deficiency of that kind yet, the individual inspectors attended to all that. Those were matters of detail that they attended to in their daily course of inspection. That would not be mentioned to me at all, it would be simply noted in their diaries. If anything occurred of that kind they would take it up themselves and have it attended to and there is no reference necessary outside of that, that is part of their duty.

Prof. KERRY.—Had your inspectors any authority to alter the erection methods decided on by the Phœnix Bridge Company?

Mr. HOARE.—No, sir. Let me understand you, you are speaking of change of design in travellers and machinery?

Prof. KERRY.—Any detail which might come up in which the inspectors would consider that the work might be more safely carried out by following a different detailed method than that adopted by the Phœnix Bridge Company.

Mr. HOARE.—If they saw anything.

Prof. KERRY.—The point I want to get clear on is this, that in our understanding of the position of the chief engineer, every detail of the work is entirely subject to his approval, and he is directly responsible for the carrying out of every detail. I want to understand whether under the contract it was understood that that responsibility rested with the officials of the Phœnix Bridge Company or with the officials of the Quebec Bridge Company.

Mr. HOARE.—The Phœnix Bridge Company were primarily responsible for the erection methods, but if the inspectors on the work saw any unsafe proceedings taking place it would be their duty to report it to myself immediately.

Prof. KERRY.—But there was no preliminary study of those methods on the part of the Quebec Bridge Company.

Mr. HOARE.—No, not beyond the conferences already mentioned between the Phœnix Bridge Company's engineers and Mr. Cooper; we relied entirely upon them.

Prof. KERRY.—And with regard to the inspectors, if they had any objection to take they only had power to report and no power to act immediately; they could not order a change, they could only report to you and advise a change.

Mr. HOARE.—They could not order any change involving the design of the whole erection plant, they could simply report any defects they saw, they might order any little change in minor methods, such as calling attention to bad steel falls in a derrick or ropes or notice anything defective in a pulley block, &c.; little things like that they could order to be changed immediately, but they could not order any radical change in the layout of the important parts of the erection plant.

Prof. KERRY.—And the conferences with Mr. Cooper on which the Quebec Bridge Company was depending were entirely at the option of the Phœnix Bridge Company?

Mr. HOARE.—Yes.

Mr. HOLGATE.—You say that those inspectors could order those matters that they noticed to be rectified. Had they the power, Mr. Hoare, to enforce the carrying out of those orders?

Mr. HOARE.—Well, they tried to.

Mr. HOLGATE.—They were acting there as your deputies.

Mr. HOARE.—Acting there as my deputies.

Mr. HOLGATE.—As such they had that power?

Mr. HOARE.—I think they had.

Mr. HOLGATE.—Were there any considerations outside of professional ability that induced you to appoint Mr. McLure?

Mr. HOARE.—Would you repeat that again?

Mr. HOLGATE.—Was Mr. McLure, in other words, appointed because he was the best available man for that position that you could find?

Mr. HOARE.—He was appointed on the recommendation of Mr. Cooper.

Mr. HOLGATE.—The reason for asking this question is that the commission has been informed that Mr. McLure is a relative of yours.

Mr. HOARE.—I never knew him in my life before Mr. Cooper appointed him.

Mr. HOLGATE.—Mr. Hoare, what you have told us, we understand you to be an engineer of general knowledge, and that your professional work has led you through a varied and rather broad experience in construction and design.

Mr. HOARE.—Yes, that is right.

Mr. HOLGATE.—But there has not been placed before us any evidence that you assume to be an expert or an authority on bridge construction as a specialty.

Mr. HOARE.—No.

Mr. HOLGATE.—Now, will you tell us, was the appointment of a specially qualified bridge engineer, a man who would have had experience in the erection of large bridge structures, ever discussed? By that I mean a man of that broad experience in that special line and whose duty it would be to remain on the ground during the construction of this work—was the appointment of such a man ever discussed?

Mr. HOARE.—Not to my knowledge.

Mr. HOLGATE.—That was never discussed, to your knowledge?

Mr. HOARE.—No.

Mr. HOLGATE.—In your capacity did you ever make a recommendation that such a man should be appointed?

Mr. HOARE.—No.

Mr. HOLGATE.—In case that such an appointment were considered desirable or necessary, whose duty would it be to make that recommendation?

Mr. HOARE.—Myself.

Mr. HOLGATE.—And did you consider it unnecessary?

Mr. HOARE.—Quite.

Mr. HOLGATE.—Now you might give us your reasons for that.

Mr. HOARE.—Because Mr. Cooper was retained as consulting engineer for reference on all particulars. The Phœnix Bridge Company had full authority to use him in any respect, to refer to him and use him in any way, as he was employed by the Quebec Bridge Company for that purpose. Mr. Cooper was informed, sometimes daily, and always at the end of each week, of the daily progress of the work, and was always consulted on any question of importance that arose from time to time.

Mr. HOLGATE.—But Mr. Cooper was not on the ground?

Mr. HOARE.—No, he was in New York.

Mr. HOLGATE.—Was he ever on the ground during construction?

Mr. HOARE.—Yes.

Mr. HOLGATE.—No, I mean with regard to the erection of the steel work.

Mr. HOARE.—I do not think he has been more than once on the ground since the steel work was commenced.

Mr. HOLGATE.—Well, having Mr. Cooper as consulting engineer does not provide for the resident engineer watching the erection; it is a man of that description that I am inquiring about.

Mr. HOARE.—It was not Mr. Cooper's duty to be on the work.

Mr. HOLGATE.—Oh, I quite understand that, but Mr. Cooper in his capacity of consulting engineer could not take the place of a resident engineer.

Mr. HOARE.—Oh, no, he was informed sufficiently often, he was in thorough touch with the whole proceedings from week to week and day to day, he was kept in touch by the way the communications and reports were made. He knew what was taking place from day to day on that work.

Prof. KERRY.—Then we would understand, Mr. Hoare, that on a very great and necessarily dangerous work, that the Quebec Bridge Company was relying for its direction on a fully qualified man who could be described as permanently resident in New York and that the only evidence he had to guide him were the reports of Mr. McLure.

Mr. HOARE.—Yes, he had those reports, and he had the detailed statement of what occurred on the work at the end of each week, and, as I said before, daily, if anything unusual occurred. Would you repeat the question?

Question read to witness as follows :—

'Then we are to understand, Mr. Hoare, that on a very great and necessarily dangerous work, that the Quebec Bridge Company was relying for its protection on a

fully qualified man who could be described as permanently resident in New York and that the only evidence he had to guide him were the reports of Mr. McLure ?'

Mr. HOARE.—I do not know that the word dangerous—I do not know whether the work could be considered dangerous.

Prof. KERRY.—The answer to the general question, Mr. Hoare; is it a correct statement of facts? Kindly tell us if that is a correct statement of facts?

Mr. HOARE.—Yes, that is all right.

Mr. KERRY.—Was there any arrangement to provide for immediately reaching Mr. Cooper ?

Mr. HOARE.—The communications were by telegraph, mail or by special trips to his office.

Prof. KERRY.—Did you communicate to any extent directly with Mr. Cooper concerning the details of the work; I mean in addition to Mr. McLure's reports; were you in personal conference with Mr. Cooper frequently?

Mr. HOARE.—Yes, on my way to Phœnixville, I made it a point to call in and discuss matters generally.

Prof. KERRY.—But only at these times, Mr. Hoare ?

Mr. HOARE.—Occasionally I would write on some matter, some question or other that might occur, but the necessity for such communication did not often occur.

The witness retired.

JOSEPH ADOLPHE HUOT, sworn.

Mr. HOLGATE.—What is your position, Mr. Huot ?

Mr. HUOT.—Time-keeper.

Mr. HOLGATE.—For the ?

Mr. HUOT.—Phœnix Bridge Company.

Mr. HOLGATE.—Where is your place of employment ?

Mr. HUOT.—Over on the south side of the Quebec bridge.

Mr. HOLGATE.—Do you keep a record of the men employed by the company on the Quebec bridge?

Mr. HUOT.—Yes.

Mr. HOLGATE.—Can you say where the men were working on the bridge ?

Mr. HUOT.—They were divided in all parts of the bridge, some on the anchor arm, others on the cantilever arm, and others on the suspended span.

Mr. HOLGATE.—Can you separate those that were working on the various parts of the bridge ?

Mr. HUOT.—There were two gangs of riveters.

Mr. HOLGATE.—I want to know if you can.

Mr. HUOT.—Yes, sir; I can give it very close, I think.

Mr. HOLGATE.—Have you a list of the men who were at work on the 29th day of August ?

Mr. HUOT.—Yes, sir.

Mr. HOLGATE.—Have you it with you ?

Mr. HUOT.—This list is of all employees prior to August 30.

Mr. HOLGATE.—Does this list show the men who were in the employ of the company on the 29th of August ?

Mr. HUOT.—Yes, they are all on this; the names and occupations of all the men employed on that day are on this.

Mr. HOLGATE.—Just produce that list.

(List produced, filed and marked Exhibit No. 24.)

Mr. HUOT.—This includes north and south.

Mr. HOLGATE.—Were all of these men working on the 29th of August?

Mr. HUOT.—Some were not.

Mr. HOLGATE.—Can you separate those?

Mr. HUOT.—I guess I can.

Mr. HOLGATE.—Now?

Mr. HUOT.—On the bridge in the morning when I made the first count there were 117 working.

Mr. HOLGATE.—Does this list include men who were working on the north side as well as the south side?

Mr. HUOT.—Yes, sir, and also in the Belair storage yard.

Mr. HOLGATE.—A list is given showing the separation of these men?

Mr. HUOT.—Yes, sir, of their occupations.

Mr. HOLGATE.—So that down to and including 148 these men were all employed on the south side?

Mr. HUOT.—Yes, sir, but not all working that day.

Mr. HOLGATE.—Can you indicate on this list the men who were working on that day?

Mr. HUOT.—Yes, sir.

Mr. HOLGATE.—I wish you would do it.

Mr. STUART.—It would be shorter to eliminate those who were not.

Mr. HOLGATE.—Whichever is the shorter way.

Mr. HUOT.—Do you want the names of those who were working in the morning and did not work in the afternoon as well?

Mr. HOLGATE.—No.

Mr. HUOT.—Just those who were working in the entire——

Mr. HOLGATE.—We want those who worked that day; any man who worked that day. (Witness examined list and checked it over.) On this list of men that is numbered 24, what do the check marks mean?

Mr. HUOT.—Men who were at work on that day, at work in the morning.

Mr. HOLGATE.—On the south side?

Mr. HUOT.—Yes, sir.

Mr. HOLGATE.—Anything unusual happen that day?

Mr. HUOT.—Nothing that I know of.

Mr. HOLGATE.—I asked you if there was anything unusual happened that day in connection with the work?

Mr. HUOT.—About 5.31 in the afternoon the bridge collapsed.

Mr. HOLGATE.—Were you on it when it collapsed?

Mr. HUOT.—Yes, sir; I was about 75 feet.

Mr. HOLGATE.—75 feet.

Mr. HUOT.—Going out on the anchor arm. I had passed the second panel going out.

Mr. HOLGATE.—Were you on your way to land or outward?

Mr. HUOT.—Outwards. Each panel is 50 feet, and I was on the second panel going out.

Mr. HOLGATE.—Yes? You might describe exactly what you saw and what you did?

Mr. HUOT.—To say the truth, I saw very many things, but I cannot very well describe what I did see because I realized in a second that I was in danger, and I had to escape, and I made the best I could to escape myself.

Mr. HOLGATE.—And you turned around?

Mr. HUOT.—I turned around and jumped, and I ran up, and I had to run up the hill to make the approach span.

Mr. HOLGATE.—Yes.

Mr. HUOT.—And it happened that the sidewalk in the centre of the bridge all separated.

Mr. DAVIDSON.—From the falling of the bridge?

Mr. HUOT.—No, sir, they were all nailed down, and that is the way they were between the two spans.

Mr. HOLGATE.—When you passed along the anchor arm did you notice a space between the anchor arm and the adjoining approach span?

Mr. HUOT.—I just saw the portal bending towards the river.

Mr. HOLGATE.—Did you notice a gap between the end of the anchor arm and the approach span?

Mr. HUOT.—In fact I did not notice a gap. I felt it, because, as my feet were striking the planks they were going under me, so that there must have been a gap somewhere because the portal was leaning towards the river then.

Mr. HOLGATE.—Do you remember what was the very first thing that called your attention to this occurrence? What first attracted your attention?

Mr. HUOT.—The first thing that attracted my attention was the compressor pipe line breaking under me. That is what attracted my attention.

Mr. HOLGATE.—Where was the compressor pipe line?

Mr. HUOT.—It was running out on the centre, on the sidewalk, out to the front, to distribute air for the riveting hammers.

Mr. HOLGATE.—Was that laid at track level?

Mr. HUOT.—It was laid on the sidewalk.

Mr. HOLGATE.—Was that sidewalk at track level?

Mr. HUOT.—About track level.

Mr. HOLGATE.—And that broke?

Mr. HUOT.—It broke on the approach span. I just heard the crack as well as the crack of the bridge collapsing. I just turned around, and in turning around the pipe line passed alongside of me. That is what attracted my attention.

Prof. GALBRAITH.—Pulled away?

Mr. HUOT.—Yes.

Mr. HOLGATE.—Did it slide along on the track?

Mr. HUOT.—It did slide along on the track. It just moved up sideways, and I just had time to jump. When the pipe turned up on the side I jumped. To say the truth, I did not know anything in particular.

Mr. HOLGATE.—Was the pipe being pulled along the track? Was it passing the ties?

Mr. HUOT.—Yes.

Mr. HOLGATE.—In which direction was that moving?

Mr. HUOT.—Towards the front.

Mr. HOLGATE.—Towards the river?

Mr. HUOT.—The river. But this was so small an item—after the pipe line had passed I had just time to jump on the side of the pipe line and everything was gone. I ran to one side of the pipe line, but that is such a small item that I could not say much about it.

Mr. HOLGATE.—But the main fact is that you heard the pipe crack?

Mr. HUOT.—I heard the crack of the bridge.

Mr. HOLGATE.—And it was pulling forward?

Mr. HUOT.—I just heard the pipe and the crack of the bridge which was collapsing all at once.

Mr. HOLGATE.—Was the anchor arm also moving? Could you tell that?

Mr. HUOT.—No, I could not tell that.

Mr. HOLGATE.—But the pipe was moving along the anchor arm?

Mr. HUOT.—What attracted me as to the pipe was that the tank of air was full and that is what attracted me more than anything else. To say the truth I could not say that the pipe was exactly moving, but I know it broke somewhere.

Mr. HOLGATE.—Where did that pipe lead to?

Mr. HUOT.—It led to the front.

Mr. HOLGATE.—Was it secured to the bridge beyond the point where the break was?

Mr. HUOT.—It led from the air tank and ran out.

Mr. HOLGATE.—Where was the air tank ?

Mr. HUOT.—On the approach span on the extreme south.

Mr. HOLGATE.—Where was the pipe laid ?

Mr. HUOT.—It was laid down on the sidewalk.

Mr. HOLGATE.—What was the size of the pipe ?

Mr. HUOT.—Two and a half or three inches.

Mr. HOLGATE.—That pipe was for what purpose ?

Mr. HUOT.—For distributing air to the hammers.

Mr. HOLGATE.—Where were the hammers working ?

Mr. HUOT.—The riveters ?

Mr. HOLGATE.—Yes.

Mr. HUOT.—There were two gangs on the anchor arm, one gang on the main post and the balance were at the front. There were eight gangs altogether.

Mr. HOLGATE.—Where were the balance ?

Mr. HUOT.—On the cantilever arm.

Prof. GALBRAITH.—Repeat that, please.

Mr. HUOT.—There were two riveting gangs on the anchor arm, one on the main post and the other five gangs were out on the cantilever arm.

Mr. HOLGATE.—Can you, from this list (exhibit No. 24) indicate where the men on this list were working at the time of this accident ?

Mr. HUOT.—Maybe I could not, because on the bridge certain men may be together at one place and in five minutes they will be 50 or 100 feet apart.

Mr. HOLGATE.—Is there anybody who could locate these men ?

Mr. HUOT.—I do not know.

Mr. HOLGATE.—Could you, with the assistance of others, locate them ?

Mr. HUOT.—In what way do you want them located ?

Mr. HOLGATE.—Showing where they were working at the time of this accident.

Mr. HUOT.—Yes, I can do that approximately.

Mr. HOLGATE.—We understand that some of these men lost their lives.

Mr. HUOT.—Yes, sir.

Mr. HOLGATE.—In connection with the survivors we would like you to indicate on this sheet (exhibit No. 24), with a red mark, the survivors and to absolutely locate where each of these men was at the time of this accident. Can you do that with the assistance of any of the men that are here ?

Mr. HUOT.—Yes, I might.

Mr. HOLGATE.—Can you do that by two o'clock ?

Mr. HUOT.—I think I can.

Mr. HOLGATE.—Well, then, if you can do that, Mr. Huot, between now and two o'clock to-day it will assist us.

Mr. HUOT.—It is quite a lot of work to do that.

Mr. HOLGATE.—There are some men here who perhaps could help you out.

Mr. HUOT.—These men that are here I know where they were, except one or two; they were not working.

Mr. HOLGATE.—There is another question I want to put. Some of these men who were not survivors were not working at that time?

Mr. HUOT.—Yes, sir.

Mr. HOLGATE.—We want those separated from the others.

Mr. HUOT.—Do you want to mark on this list all these different separations ?

Mr. HOLGATE.—You are not an engineer ?

Mr. HUOT.—No, sir.

Mr. HOLGATE.—But in the course of your work you would have to visit the various portions of the structure ?

Mr. HUOT.—No, sir. You only pass through to see that the men are all there and check the men up.

Mr. HOLGATE.—In doing that, did you check them where they were working ?

Mr. HUOT.—I checked them sometimes where they were working and other times I would see them going out.

Mr. HOLGATE.—In order to do that you would have to travel over the bridge?

Mr. HUOT.—No, I did not need to.

Mr. HOLGATE.—You had to at times?

Mr. HUOT.—I had to a very few times.

Mr. HOLGATE.—Have you, of your own knowledge, any information regarding any defect that existed?

Mr. HUOT.—None at all.

Prof. GALBRAITH.—How long had you been on the bridge before the accident?

Mr. HUOT.—I left the office at a quarter to five to go out and I came back.

Prof. GALBRAITH.—The office is at the end of the bridge?

Mr. HUOT.—At the south end of the approach span.

Prof. GALBRAITH.—You say that you did not find it necessary to go on the bridge often? What were you doing on it that day?

Mr. HUOT.—I was supposed to go at least four times a day to check up my men.

Prof. GALBRAITH.—It was your ordinary duty?

Mr. HUOT.—That was my ordinary duty and I could take myself the best way I could to save my time.

Witness retired.

Mr. HOARE, recalled.

Mr. HOLGATE.—Prior to the collapse of the bridge had anything abnormal or unexpected occurred during the construction which, in your opinion, required the special attention of an engineer of special qualifications as a bridge engineer?

Mr. HOARE.—My answer I have written out as follows :—I may say that the work of erection followed an entirely normal course. The tests made showed the deflection expected occurred, and the whole construction up to the time of the collapse followed the anticipated course. I was myself frequently on the works and it never occurred to me that with my long experience I was not absolutely qualified to superintend the construction of the bridge and I still think so. If anything abnormal had occurred I should have sent for Mr. Cooper, but nothing suggesting the slightest danger to the bridge occurred and I do not now see what difference Mr. Cooper's presence here during construction would have made.

Mr. HOLGATE.—May not, in a work of this nature, Mr. Hoare, abnormal and unexpected conditions arise at any moment? I am speaking of a structure of this nature. May not they arise at any moment?

Mr. HOARE.—It is quite possible.

Mr. HOLGATE.—Is it not a thing that you might almost expect?

Mr. HOARE.—No, I would not say that.

Mr. HOLGATE.—At any rate, if you would not go so far as to expect them, would you not prepare for them?

Mr. HOARE.—I consider that we prepared for them.

Mr. HOLGATE.—Then when you did send to Mr. Cooper you considered the question abnormal?

Mr. HOARE.—No, I would not say that. We made a practice of keeping Mr. Cooper thoroughly posted on everything that occurred from day to day.

Mr. HOLGATE.—I quite appreciate that, but Mr. Cooper, understand, could not come to the bridge.

Mr. HOARE.—No, and I considered that it was not necessary.

Mr. HOLGATE.—Is there anything you want to say?

Mr. HOARE.—No, I do not think so. It was only to make that a little more clear. It left it in rather an indefinite position.

The Commission took recess.

AFTERNOON SESSION—FOURTH DAY.

The Commission resumed at two p.m.

Mr. CUDWORTH, recalled.

Mr. HOLGATE.—There is a tracing here, Mr. Cudworth, without any title and without any date on it. Can you tell us what this is?

Mr. CUDWORTH.—This is a tracing furnished by the Quebec Bridge Company from which to locate a few points to use in the investigation,—to locate them on the plans.

Mr. HOLGATE.—What does the plan show?

Mr. CUDWORTH.—Part of it upon which I have worked is to show the position of the dock, the path and the road from the highway to the bridge near the beach; also the location of derricks, of a tree and the point where a man stood who observed the fall of the bridge.

Mr. HOLGATE.—Does it show the position of the bridge also in relation to these other things?

Mr. CUDWORTH.—Yes, sir. That was put on before the plan came to me.

Mr. HOLGATE.—Generally speaking, is the plan correct?

Mr. CUDWORTH.—As far as I know the plan is correct.

Mr. HOLGATE.—Did you assist in making the survey?

Mr. CUDWORTH.—Yes, sir, and plotting it in pencil. That is this survey only of the additions; not of the plan as it came originally to us from the Quebec Bridge Company.

Mr. HOLGATE.—Generally speaking, the plan is a correct one in that it shows the relative positions of the various points in respect to the bridge itself?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—When was this survey made?

Mr. CUDWORTH.—You mean the part that we worked on?

Mr. HOLGATE.—Yes.

Mr. CUDWORTH.—I could not give you the date of that without referring to my notes at the bridge.

Mr. HOLGATE.—Was it made since the day of the accident?

Mr. CUDWORTH.—Yes, it was made since the accident. (Plan put in and filed and marked Exhibit No. 25).

Mr. HOLGATE.—Here is a white print of a plan, Mr. Cudworth. What generally, does this indicate?

Mr. HOLGATE.—That is called by us the general line plan of the bridge. We refer to it as the general plan.

Mr. HOLGATE.—Does it show the anchor arm?

Mr. CUDWORTH.—Yes, sir, it shows the anchor arm, the cantilever arm and half of the suspended span.

Mr. HOLGATE.—Do you recognize this as a plan that was used in connection with the work?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE.—As showing generally, what?

Mr. CUDWORTH.—Showing the general dimensions, clearance, width and height of waterway.

Mr. HOLGATE.—Level of span?

Mr. CUDWORTH.—Yes, sir.

Mr. HOLGATE. The designation of the various parts of the bridge as far as the plan goes?

Mr. CUDWORTH.—Yes, not fully but as far as the plan goes. I might state that this is the normal diagram.

Prof. KERRY.—You may say that this plan is not lettered to correspond with the erection diagrams ?

Mr. CUDWORTH.—Most of the numbers correspond, but not all of them.

Prof. KERRY.—In some cases the lettering is changed.

Mr. CUDWORTH.—The marks are not necessarily the same; in fact they are not the same as those used in the erection—not in all cases the same.

Mr. HOLGATE.—Is there a similar plan to this with the exactly correct marking on ?

Mr. CUDWORTH.—No, sir, not to my knowledge.

Mr. HOLGATE.—Could you re-mark the portions of this plan that do not agree with the other erection diagram ? We want to get a plan on a good large scale ?

Mr. CUDWORTH.—Yes, sir.

J. HUOT recalled.

Mr. HOLGATE.—Have you got that information ?

Mr. HUOT.—Yes, sir.

Mr. HOLGATE.—You had better state what the blue marks opposite the names of the men on Exhibit 24 mean.

Mr. HUOT.—The blue marks mean the survivors who were not working at the time of the accident.

Mr. HOLGATE.—And what do the red marks mean ?

Mr. HUOT.—It means the survivors who were working at the time of the accident and the exact location of each man as near as we could make it out.

Mr. HOLGATE. Then this to the best of your knowledge is correct ?

Mr. HUOT.—Yes, sir.

The witness retired.

E. J. WICKIZER, sworn.

Prof. KERRY.—what was your position on the work, Mr. Wickizer ?

Mr. WICKIZER.—Foreman of preparations, such as putting up false work and foundations.

Prof. KERRY.—That is both on the work on the south shore and the work on the north shore ?

Mr. WICKIZER.—Yes, sir, since June, 1904.

Prof. KERRY.—So you did not have to work on the installation of the span itself ?

Mr. WICKIZER.—No, sir.

Prof. KERRY.—What was the last date that you were out on the work on the south shore, Mr. Wickizer ?

Mr. WICKIZER.—I could not give you that date.

Prof. KERRY.—Approximately ?

Mr. WICKIZER.—Well probably about the 10th of August.

Prof. KERRY.—At the time of the accident you were where ?

Mr. WICKIZER.—On the west side, right opposite the bridge.

Prof. KERRY.—Out on the false work ?

Mr. WICKIZER.—No, sir, I was on the dock right by the main pier, probably 50 feet back of the main pier to the east.

Mr. HOLGATE.—Will you tell us any details of the accident you had opportunities to observe, what you actually saw ?

Mr. WICKIZER.—Well, when the span started to fall the first thing that I looked at was the main pier and I noticed that the plates on the main post, probably 20 feet above the shoe, seemed to be rolling up and next my eyes went to the front and the front was moving slowly, probably 75 feet below the level line of the floor, and about that time the main post seemed to be going and the back part did not seem to move

any but a little bit forward towards the north side. That is my view and when she got about I should say 35 or 40 feet from the water it all seemed to collapse and go sudden. Before that in my sight it was very slow, it just kind of gradually——

Mr. HOLGATE.—What first attracted your attention?

Mr. WICKIZER.—A kind of grinding noise.

Mr. HOLGATE.—The sound of the——

Mr. WICKIZER.—Yes, sir, and also the men shouting.

Mr. HOLGATE.—So that practically the accident had already taken place before you had an opportunity to observe it.

Mr. WICKIZER.—Yes, sir.

Mr. HOLGATE.—Do you know at all what material was on the span at the time of the accident, Mr. Wickizer?

Mr. WICKIZER.—What material?

Mr. HOLGATE.—Yes, was piled up there; had you an opportunity of knowing it?

Mr. WICKIZER.—For erection do you mean?

Mr. HOLGATE.—Yes?

Mr. WICKIZER.—There was one set of bars that I could see on the cars on the east side on the erection girders that is used for erection on two cars, that I could see plainly and the others I could not see, they were not to the front yet.

Mr. HOLGATE.—You had not been on the span recently?

Mr. WICKIZER.—I were not very familiar with that part of the work because it was out of my business altogether, because I only had charge of looking after the preparations on the north side, therefore, the erection did not concern me, just from a practical standpoint to see what I could see and learn.

Prof. GALBRAITH.—You said, Mr. Wickizer, that your attention was first called to the centre posts?

Mr. WICKIZER.—Yes.

Prof. GALBRAITH.—Failing at a place about 20 feet above the floor?

Mr. WICKIZER.—Yes, that is judging the distance from where I stood.

Prof. GALBRAITH.—And that the plates seemed to have rolled up?

Mr. WICKIZER.—Yes, a kind of tendency to crush as it was going down.

Prof. GALBRAITH.—These plates at the side that you saw twist?

Mr. WICKIZER.—It seemed to be rolling.

Prof. GALBRAITH.—Sideways?

Mr. WICKIZER.—Yes, sideways.

Prof. GALBRAITH.—Not from the west, not towards you.

Mr. WICKIZER.—Yes, there was a tower and that shoved off on the up side first, on the west side first.

Prof. GALBRAITH.—Will you yourself draw the appearance of those plates after they had been disturbed, just draw a line to show what you mean?

Mr. WICKIZER.—It looked to me from where I stood as though it was going to roll up and crush down.

Prof. KERRY.—Were the main posts still plumb at that time?

Mr. WICKIZER.—Yes, sir, they appeared to be settling down very slowly at the top, they seemed to be very level.

Prof. GALBRAITH.—The post was falling towards you?

Mr. WICKIZER.—They seemed to be a little bit towards me, enough that I could notice it standing in a direct line.

Prof. GALBRAITH.—You could hardly see that?

Mr. WICKIZER.—Of course I was 1800 feet from where these were.

Prof. GALBRAITH.—What was the appearance of the failure as you noticed it, about you say 20 feet above the floor?

Mr. WICKIZER.—The posts seemed to be crushing.

Prof. GALBRAITH.—Now you are sure there were plates on these sides, there was not lattice work or anything of the kind, plates?

Mr. WICKIZER.—Well, of course, you cannot be positive 1,800 feet——

Prof. GALBRAITH.—But you do not remember the construction, I have not the drawings here.

Mr. WICKIZER.—1,800 feet is a very long vision.

Prof. GALBRAITH.—The plates on the east and west sides seemed to curl over at the fracture? Is that what you said?

Mr. WICKIZER.—Yes, sir.

Prof. KERRY.—Referring to your general work did you generally carry out your day's work following the diagram supplied from the Phœnix office?

Mr. WICKIZER.—Yes, sir, to the letter.

Prof. KERRY.—You were working more to diagrams than to the personal directions of Mr. Yenser?

Mr. WICKIZER.—Yes, sir, working to plans.

Prof. KERRY.—And you found the plans to be entirely satisfactory and full?

Mr. WICKIZER.—Yes, sir.

Prof. KERRY.—That they gave you all the information you required for the purpose?

Mr. WICKIZER.—Yes, sir, my instructions were to follow them out, the plans, to make no changes whatever.

Prof. KERRY.—Those would be instructions from Mr. Yenser?

Mr. WICKIZER.—This was my instructions from the Phœnix Bridge Company whose foreman, Mr. Yenser, was on the work.

Prof. KERRY.—I see.

Mr. WICKIZER.—That was also my instructions from Mr. Milliken the second time I came here on the north side. Of course to that part of it I never had any instructions from Mr. Yenser at all, although he was my superior, but that instruction came from Mr. Milliken.

Mr. HOLGATE.—Mr. Davidson, can you suggest any questions to ask from Mr. Wickizer?

Mr. DAVIDSON.—No.

Mr. HOLGATE.—Mr. Stuart, is there any that you wish to have asked?

Mr. STUART.—No.

Witness discharged.

C. L. CULBERT sworn.

Prof. GALBRAITH.—Were you at work the day of the accident?

Mr. CULBERT.—No, sir, I was not.

Prof. GALBRAITH.—Where were you?

Mr. CULBERT.—Standing up along the river shore.

Prof. GALBRAITH.—At the time of the accident?

Mr. CULBERT.—At the time of the accident, yes, sir.

Prof. GALBRAITH.—This is a plan showing the location of the bridge (Exhibit 25) and the shore.

Mr. CULBERT.—I believe I understand that thoroughly.

Prof. GALBRAITH.—Show me on this diagram where you were standing at the time of the accident?

Mr. CULBERT.—Just about here, where the road turns in to meet the other little bit of an air cut, (marked 'A' on Exhibit 25).

Prof. GALBRAITH.—Were you standing still?

Mr. CULBERT.—No, we were walking down.

Prof. GALBRAITH.—Which way?

Mr. CULBERT.—Toward the bridge, just on the point of the road, the turn.

Prof. GALBRAITH.—What first called your attention to the accident?

Mr. CULBERT.—Why, the first thing I saw was something up on the anchor arm,

what it was I do not know; it looked to me just more like a flash of smoke than anything else I can compare it to, it was something up there.

Prof. GALBRAITH.—On what part of the top?

Mr. CULBERT.—On the extreme top or chord.

Prof. GALBRAITH.—At the top chord?

Mr. CULBERT.—On the top of the top chord.

Prof. GALBRAITH.—Did that appear clear against the sky line?

Mr. CULBERT.—No, it appeared to be right on the chord.

Prof. GALBRAITH.—Which chord, the east or the west?

Mr. CULBERT.—On the top chord, the Montreal chord.

Mr. DAVIDSON.—The west?

Mr. CULBERT.—On the Montreal side.

Prof. GALBRAITH.—On the Montreal side, the west chord?

Mr. CULBERT.—Yes.

Prof. GALBRAITH.—That would be the chord which would seem highest against the sky?

Mr. CULBERT.—Well, what I mean, it was right on these chords, I do not know which chord it was on.

Prof. GALBRAITH.—What I want to get you to say is whether it was the highest point against the sky on that bridge at that place.

Mr. CULBERT.—Well, it was in the highest point I could see, but it might have been back over the edge of that highest point.

Prof. GALBRAITH.—Now, can you locate the position lengthwise of the bridge, of that appearance, of that smoke? Have you any means of fixing the position on the bridge, can you point it out on this plan?

Mr. CULBERT.—I do not know whether I could or not, because it started there and the excitement coming so quick I do not know just what spot it was, I know it was somewhere near the centre.

Prof. GALBRAITH.—Near the centre of the anchor arm?

Mr. CULBERT.—Near the centre of the anchor arm.

Prof. GALBRAITH.—Did you make any attempt to get the line of it?

Mr. CULBERT.—In what way, afterwards?

Prof. GALBRAITH.—Afterwards or at the time?

Mr. CULBERT.—I went down there afterwards to see if I could see anything broken or anything in that line, and I could not see anything that I can think could possibly break up there. I thought for a while it might be a flash of electricity. I am undecided in my own mind what it was.

Prof. GALBRAITH.—This is the tree which you pointed out to Mr. Holgate and myself on the ground (tree marked 'B' on exhibit 25)?

Mr. CULBERT.—Yes.

Prof. GALBRAITH.—Can you show on the plan the direction in which you saw this appearance on the bridge by means of that tree, can you show which side of that tree it was on?

Mr. CULBERT.—Why, I do not know; it seemed to me on the left hand side of the tree as I was looking up. Of course that tree did not obstruct anything, that tree was entirely too low.

Prof. GALBRAITH.—It seemed to you to be on the left hand side?

Mr. CULBERT.—A little on the left of the tree.

Prof. GALBRAITH.—The side towards the river.

Mr. CULBERT.—The side towards the river from where I was standing.

Prof. GALBRAITH.—How far would you estimate that distance, 10 feet, 20 feet, 30 feet, 50 feet?

Mr. CULBERT.—I could not give much of an estimation of it, because it is something I am not exactly sure of.

Prof. GALBRAITH.—What did you do as soon as you saw this smoke on the bridge?

Mr. CULBERT.—As soon as I saw the smoke on the bridge I just started out; at first that anchor arm seemed to rise up a little.

Prof. GALBRAITH.—At what place?

Mr. CULBERT.—It seemed to rise generally all around the centre of it.

Prof. GALBRAITH.—And then?

Mr. CULBERT.—A fellow was with me, I said: There she goes and I started for the bridge.

Prof. GALBRAITH.—How do you mean?

Mr. CULBERT.—I started to run towards it, yes, and it just began to crash and rumble——

Prof. GALBRAITH.—What was the name of the man with you?

Mr. CULBERT.—I believe his name is Chase or Hase. He is sitting over there.

Prof. GALBRAITH.—Did you look towards the cantilever span?

Mr. CULBERT.—Why, I remember distinctly seeing somebody running towards the shore.

Prof. GALBRAITH.—I did not mean that, did you look at the cantilever span, did you see it fall?

Mr. CULBERT.—No, I did not, I did not see it hit the ground.

Prof. GALBRAITH.—Hit the water?

Mr. CULBERT.—The cantilever, oh, we saw that hit the water.

Prof. GALBRAITH.—You saw it?

Mr. CULBERT.—I got my eye on it just about the time it hit the water. I was watching the fellow running to the shore and I was running at the same time myself.

Prof. GALBRAITH.—You think then, to sum up, that the appearance that called your attention to the bridge, was an appearance of haze near the upper chords about the centre of the anchor arm?

Mr. CULBERT.—Yes, sir.

Prof. GALBRAITH.—Do you recognize this drawing of the bridge (Exhibit 26)?

Mr. CULBERT.—Yes, I recognize that.

Prof. GALBRAITH.—Could you point out on this plan whereabouts you saw that burst of haze or smoke?

Mr. CULBERT.—It was some place in around here in the centre, I could not point cut the exact spot to you, it was near the centre.

Prof. GALBRAITH.—Do you know of any defects in the bridge before it fell?

Mr. CULBERT.—Not that I personally saw. I heard speak of them but I did not see them. There was some defects there, I do not know if you would call them defects or not, but it would try a man's courage when they were dropping anything from the traveller to the span you could feel it give.

Prof. GALBRAITH.—And return?

Mr. CULBERT.—Oh, yes.

Prof. GALBRAITH.—The spring?

Mr. CULBERT.—The spring of it; it seemed to me a little more than it ought to be.

Mr. HOLGATE.—Did you work out there?

Mr. CULBERT.—Yes.

Mr. HOLGATE.—Did you continue work after you noticed that?

Mr. CULBERT.—Everybody worked. Us fellows work as long as there is anything to stand on.

Prof. GALBRAITH.—Did you see any bending during the accident, at the time of and during the accident, in either lower or upper chord? Any change of shape in either lower or upper chord?

Mr. CULBERT.—I saw this cantilever arm start down; of course it changed all kinds of shapes; just a mass of rumbling roar, and that electricity.

Prof. GALBRAITH.—You saw all sorts of changes, you say?

Mr. CULBERT.—The biggest part of everything was blurred in the electricity.

Prof. GALBRAITH.—What do you mean, 'in the electricity ?'

Mr. CULBERT.—The electricity wires got to flashing, you can see blue fire all over the business. There was a lot of smoke and that would naturally attract a man's attention to that, it was something flashy.

Prof. GALBRAITH.—You could not point to any particular chord or position where any bending took place ?

Mr. CULBERT.—I could not.

Mr. HOLGATE.—Did you look for any such ?

Mr. CULBERT.—No, sir, I did not. No such ideas as that were in my head, my idea was to get down as quick as I could to see if I could get anybody out who was crippled or injured. What first attracted my attention when I saw this was a boat sitting at one side there and my idea was to get that boat and get into the river.

Witness discharged.

RICHARD CHASE, sworn.

Prof. GALBRAITH.—Mr. Chase, you were walking with the last witness, Mr. Culbert, at the time the accident occurred ?

Mr. CHASE.—Yes, sir.

Prof. GALBRAITH.—Do you confirm his statements, are his statements correct?

Mr. CHASE.—Well, I could not say; of course I was looking in a different direction altogether from him.

Prof. GALBRAITH.—What did you see ?

Mr. CHASE.—I just saw the towers fall down and I saw the big traveller tip up and the first glance I saw the engine; I looked straight at the post and saw the engine tip out, that is the first thing I saw.

Prof. GALBRAITH.—You looked then at the part of the bridge from the main pier outwards towards the river ?

Mr. CHASE.—Outwards towards the river, I did not look at the anchor arm, I did not see it, it was down before I took a glimpse at it.

Prof. GALBRAITH.—Which way did the towers fall ?

Mr. CHASE.—The tower first as I saw it, the top was towards the north shore and then all of a sudden it kind of kicked back and fell.

Prof. GALBRAITH.—What was the first motion of the towers that you noticed?

Mr. CHASE.—The first motion of the towers that I noticed was just a bend over and the top went over about 20, about 30 feet and then dropped.

Mr. HOLGATE.—To the north ?

Mr. CHASE.—Yes, sir, to the north shore.

Prof. GALBRAITH.—Then the whole thing went suddenly ?

Mr. CHASE.—The whole thing went suddenly.

Prof. GALBRAITH.—And the lower part of the towers kicked backwards?

Mr. CHASE.—Kicked back and fell right in a heap.

Mr. GALBRAITH.—Of both towers ?

Mr. CHASE.—Both towers.

Prof. GALBRAITH.—What sort of motion was it, what I mean is this : Was it slow at first and afterwards did it go very suddenly or was it gradual through the whole fall ?

Mr. CHASE.—It went very slow at first until it got started, and then she went down in a heap. She went very slow and then fell down very quickly. I did not have time to see much of the cantilever arm, after it got down I did not see it, but the big traveller just fell right over, the big traveller.

Prof. GALBRAITH.—Did the cantilever seem to crumble up or did it keep its whole length?

Mr. CHASE.—It kept its whole length according to what I could see, kept its whole length and hit the water.

Prof. GALBRAITH.—You saw the outer end hit the water?

Mr. CHASE.—Not the outer end, it was in the water before I saw it, I just saw the top of the traveller.

Prof. GALBRAITH.—If the outer end was in the water before you saw it, how did you see the top of the bridge fall slowly?

Mr. CHASE.—I was going by the tower.

Prof. GALBRAITH.—You were not watching the river end?

Mr. CHASE.—No, I did not watch it; I had my sight on the towers all the time.

Prof. GALBRAITH.—You never then saw any of the cantilever arm touch the water?

Mr. CHASE.—No, sir.

Prof. GALBRAITH.—And when you said that that seemed to keep straight you referred to the tower and not to the cantilever arm?

Mr. CHASE.—I could not see the end of it touch the water, but I saw the pier and all the time; the bottom chord——

Prof. GALBRAITH.—The bottom chord of the cantilever end——

Mr. CHASE.—was straight all the time.

Prof. GALBRAITH.—And how far out from the pier did you see the bottom chord?

Mr. CHASE.—About two panels.

Prof. GALBRAITH.—How was it you did not see more?

Mr. CHASE.—I guess because I saw it and as soon as I saw it I began to run, and I had to take glimpses as I ran on account of the stones. I could not look at the stones and the bridge at the same time.

Prof. GALBRAITH.—How long after you noticed the accident was it before it was over?

Mr. CHASE.—Oh, I should judge about three minutes from the time it struck the water until all the swells and everything was all over.

Prof. GALBRAITH.—I mean how long was the bridge in going down?

Mr. CHASE.—That went down I should judge in about seven or eight seconds after it got started.

Prof. GALBRAITH.—While I hold this watch will you tell me when you think the same amount of time has elapsed?

Mr. CHASE.—I should judge about now.

Prof. GALBRAITH.—That is about four seconds.

Mr. CHASE.—That is about how long. I was walking towards the bridge, and I was walking on the river side, and had my hands in my pockets, and Culbert and I as we were walking were discussing how many more panels were to be put in and he said, 'no, there ain't any more,' and I heard the bridge and looked around, I turned around and saw the engine shoot to the end, about one panel.

Prof. GALBRAITH.—You saw the engine shoot how far?

Mr. CHASE.—About one panel, about 50 feet.

Prof. GALBRAITH.—How far from the pier was the engine?

Mr. CHASE.—The engine when I saw it was one panel from the pier; I could not say whether it was going in or out. She was on the cantilever arm, one panel out, about fifty feet from the pier.

Prof. GALBRAITH.—And how far did you see her move?

Mr. CHASE.—She shot one panel more.

Prof. GALBRAITH.—Towards the water?

Mr. CHASE.—Towards the water.

Prof. GALBRAITH.—Did both towers appear to go together?

Mr. CHASE.—Well, that I could not say. After I had my eyes on the tower I looked at the bottom and saw it kick out, and I could not say after it touched the ground whether they got down together or not, I could not say. I did not have my mind quite down then, I was a little nervous.

Prof. KERRY.—Did it strike the ground before it started to crumple up badly?

Mr. CHASE.—Well, I could not say that either.

Prof. GALBRAITH.—Did the tower drop as a whole or was it broken before it fell?

Mr. CHASE.—I could not say it was broken either, because when I saw the tower first, it was standing up straight and along for about 30 feet it went slowly and then kicked back and fell all of a sudden, crash down the piers.

Prof. GALBRAITH.—I understand, you did not say this in your evidence, but this is my understanding of it, that you did not see more of that bridge while it was falling than perhaps from a panel behind the main pier to two or three panels forward of the main pier?

Mr. CHASE.—Two panels before the main pier, that is on the suspension arm, but I did not take notice of anything back of the pier on the anchor arm.

Prof. GALBRAITH.—You said you saw the tower kick back?

Mr. CHASE.—I saw the tower kick back but I did not see it kick on the anchor arm.

Prof. GALBRAITH.—You watched only about one or two panels of the cantilever arm next the tower during the accident?

Mr. CHASE.—Yes, sir.

Prof. GALBRAITH.—Do you know of any defects in the material or construction of the bridge of your own knowledge?

Mr. CHASE.—No, sir, I do not; but I saw a lot of engineers and all the bosses on the bottom chord on the suspension arm, on the cantilever, I should say the first panel out on the Quebec side from the tower; I saw a gang of the inspectors there and the bosses and all and I was working on the shoe with a man named LaChapelle.

Prof. GALBRAITH.—What is the nature of your duties?

Mr. CHASE.—I was in the scaffold gang, hanging scaffolds for the riveters.

Prof. GALBRAITH.—And how long had you been in the employment of the company?

Mr. CHASE.—I should judge going on six months now, it is more than six months, I started this job the 10th of May when they opened up.

Prof. GALBRAITH.—You were not working the morning of the accident?

Mr. CHASE.—Yes, sir.

Prof. GALBRAITH.—Oh, you were working the morning of the accident?

Mr. CHASE.—Yes, sir.

Prof. GALBRAITH.—At what place were you working then?

Mr. CHASE.—On the main post, half way up on the main post.

Prof. GALBRAITH.—How high up?

Mr. CHASE.—I should judge about 50 feet.

Mr. HOLGATE.—Is that the centre post?

Mr. CHASE.—Yes, I was out on a small strut on the cantilever side, the riveters were letting a scaffold down.

Mr. HOLGATE.—Did you work steadily on the bridge or did you often take a day off?

Mr. CHASE.—Oh, I took a day off once in a while, but I was pretty steady on the bridge. Only the wind stopped me once in a while, when it was too strong I did not like to work on the bridge, the wind being too strong.

Mr. HOLGATE.—And in the time that you were employed on that bridge you never noticed anything that you would call a defect in the bridge?

Mr. CHASE.—I saw one, but we had mended that, me and the boss riveter, we had to put a plate over that. But that was, I could not say what month that was in, now.

Mr. HOLGATE.—Where was that place?

Mr. CHASE.—That was on the anchor arm, I could not say, it was the fourth or fifth post from the pier.

Mr. HOLGATE.—Counting from the pier?

Mr. CHASE.—From the pier, from the towers.

Mr. HOLGATE.—From the main towers, the centre posts?

Mr. CHASE.—There was a break in the iron and we put a plate over it.

Mr. HOLGATE.—What plate was broken?

Mr. CHASE.—A plate that held the ladels post and chord together.

Mr. HOLGATE.—Had the old plate been taken off and a new plate put on, or had the plate, the broken plate, simply been repaired?

Mr. CHASE.—Just put a little piece on top of her.

Mr. HOLGATE.—Was it a heavy plate?

Mr. CHASE.—Oh I guess about a half inch plate.

Mr. HOLGATE.—When was that?

Mr. CHASE.—I could not say; it was in June or July, I think in some part of July.

Mr. HOLGATE.—That is the only defect that you ever knew of to your own knowledge?

Mr. CHASE.—Yes, sir.

Prof. KERRY.—You were working on the main posts, Mr. Chase?

Mr. CHASE.—Yes, sir, that morning.

Prof. KERRY.—Were you working near the bottom of the main post?

Mr. CHASE.—No, about 50 feet above the deck.

Prof. KERRY.—How long was it since you were working near the foot of the main post?

Mr. CHASE.—I should judge, well somewheres, the day before, I think Tuesday or Wednesday I was working at the shoe.

Mr. HOLGATE.—You have heard the statement that one of the plates right close to the shore there was cracked?

Mr. CHASE.—I heard something about it. I was working down there once with the boss riveter and he spoke of it, and just then the whistle blew and I did not notice.

Prof. KERRY.—You do not know it was cracked and do not know it was not?

Mr. CHASE.—I do not. It might have been cracked, as he said it was cracked, but I never saw it.

Prof. KERRY.—Who told you?

Mr. CHASE.—Alexander Ouimet.

Prof. KERRY.—Was he the man you were working with?

Mr. CHASE.—No, but I happened to be down there.

Prof. KERRY.—Who was the boss riveter?

Mr. CHASE.—Slim Meredith. I do not know his first name, all I know is Slim Meredith.

Mr. STUART.—He is not able to localize the place where the mended plate was.

Prof. GALBRAITH.—About what post was that?

Mr. CHASE.—I do not know whether it was the fourth or fifth panel post from the main tower out on the Quebec side.

Prof. GALBRAITH.—About the fourth or fifth post from the main towers and on the Quebec side.

Mr. CHASE.—On the Quebec side.

Prof. KERRY.—And on the anchor arm?

Mr. CHASE.—On the anchor arm.

Prof. GALBRAITH.—And on the anchor arm, that is the Quebec side, the down river side?

Mr. CHASE.—Yes, sir.

Witness discharged.

JOSEPH LEFEBVRE, sworn.

The witness expressed a desire to testify in French.

Mr. G. G. STUART, K.C., being sworn, acted as interpreter.

Prof. GALBRAITH.—What was your job on the bridge, Mr. Lefebvre?

Mr. LEFEBVRE.—Day labourer.

Prof. GALBRAITH.—How long have you been employed on the bridge?

Mr. LEFEBVRE.—Seven or eight months working on the bridge.

Prof. GALBRAITH.—Were you working on the bridge on the day of the accident?

Mr. LEFEBVRE.—Yes. I was working underneath the bridge the day of the accident about 30 feet higher up in the Montreal direction than the bridge and about 100 feet from the anchor arm. I was out from under the bridge about 30 feet and 100 feet up from the anchor arm. I was working really on the beach.

Prof. KERRY.—100 feet from the main pier?

Mr. LEFEBVRE.—The main pier is the extreme outside; about 400 or 500 feet from the main pier.

Prof. GALBRAITH.—Near the anchor pier?

Mr. LEFEBVRE.—About 100 feet from the anchor pier.

Prof. GALBRAITH.—What did you see at the time of the accident?

Mr. LEFEBVRE.—I heard a loud noise and I looked up and then saw the bridge slowly sinking. I then moved 12 to 15 feet and by that time the bridge was wholly down.

Prof. GALBRAITH.—Where did you hear this loud noise?

Mr. LEFEBVRE.—It seemed to me to come from near the anchor pier. That is what it seemed to me.

Mr. ROY.—Perhaps you might indicate on the plan or a photo?

Prof. GALBRAITH.—We will take one of our own exhibits. Can you determine on the plan the main pier and the anchor pier? (Witness was shown plan marked Exhibit No. 25.) Witness points out on the plan the main pier, the anchor pier and the abutment.

Prof. GALBRAITH.—Point out where you were at the time of the accident. (Witness points out the place and it was marked with the letter 'C') adding 'I was opposite the derrick.'

Prof. GALBRAITH.—Can you indicate on the plan which is the Montreal side and which the Quebec side of the bridge? (Witness points it out correctly).

Prof. GALBRAITH.—What part of the bridge did you see during the accident?

Mr. LEFEBVRE.—I saw the portion of the bridge from about the third panel to the sixth panel or the seventh panel.

Prof. GALBRAITH.—Did you see anything particular or strange during the accident?

Mr. LEFEBVRE.—No, nothing.

Prof. GALBRAITH.—You were alone?

Mr. LEFEBVRE.—No, we were four or five—I think five—together.

Prof. GALBRAITH.—What did you and your fellows do after the accident?

Mr. LEFEBVRE.—We ran away towards the derricks. In doing so we turned our backs to the bridge.

Mr. HOLGATE.—Who was with you?

Mr. LEFEBVRE.—Four or five other men.

Mr. HOLGATE.—What were the names of the other men?

Mr. LEFEBVRE.—Johnson, Frank Proulx, Ferdinand, Roberge, a Russian whose name I do not know, and another Englishman or American whose name I do not know.

Witness adds that when he ran towards the derrick he immediately turned and ran towards the river to take a skiff that was there in order to render assistance to the people who had fallen into the river.

Mr. HOLGATE.—Had you any duties that would carry you on the structure itself?

Mr. LEFEBVRE.—No.

Mr. HOLGATE.—Then, of your own knowledge, you know nothing about the condition of the bridge?

Mr. LEFEBVRE.—I heard things, but personally I do not know. I did not work on the bridge.

Mr. HOLGATE.—Can you give us positive information in regard to the bridge itself?

Mr. LEFEBVRE.—No, I am unable to.

Prof. GALBRAITH.—Did you see anything defective from below?

Mr. LEFEBVRE.—No, nothing at all.

Mr. HOLGATE.—Did you see any defect referred to in any conversation?

Mr. LEFEBVRE.—I saw nothing at all.

Witness discharged.

MICHAEL ESMOND, sworn.

Mr. HOLGATE.—What is your occupation?

Mr. ESMOND.—I was a boatman.

Mr. HOLGATE.—Where?

Mr. ESMOND.—I was fast to the bridge in case anything should fall over to pick it up.

Mr. HOLGATE.—How long had you been there?

Mr. ESMOND.—I had been there all last summer from the 3rd of July to November, 1906.

Mr. HOLGATE.—Always the same occupation?

Mr. ESMOND.—Yes.

Prof. GALBRAITH.—And this summer?

Mr. ESMOND.—I commenced on the 14th of May. Sometimes I used to be on the shore in what was called the bull gang.

Prof. GALBRAITH.—From May up till now?

Mr. ESMOND.—From May up till now.

Mr. HOLGATE.—Then, your duties never took you on the structure itself?

Mr. ESMOND.—No, sir.

Mr. HOLGATE.—Were you on duty the day of the accident?

Mr. ESMOND.—Yes, sir.

Mr. HOLGATE.—Have you got a clear recollection of what you noticed in consequence?

Mr. ESMOND.—Yes, of what I saw.

Mr. HOLGATE.—Where were you then at the time the accident happened?

Mr. ESMOND.—I was fast between the tenth and eleventh panel of the caisson.

Prof. KERRY.—You were tied to the bridge, Mr. Esmond?

Mr. ESMOND.—Yes, sir, between the tenth and eleventh panel. (Witness pointed out on plan marked Exhibit No. 25 the position he occupied at the time.)

Mr. HOLGATE.—You were outside of the bridge?

Mr. ESMOND.—Yes.

Prof. GALBRAITH.—Up stream or down stream?

Mr. ESMOND.—Down stream on the ebb tide.

Mr. HOLGATE.—Your position was that you were looking upwards at the bottom of the bridge?

Mr. ESMOND.—Yes, sir; my attention was all the time on the rising gang, the climbers, the men working outside.

Mr. HOLGATE.—Could you see the position of the big traveller from where you were?

Mr. ESMOND.—Yes, sir; the big traveller was a few feet inside of me. I was moved a little in case anything fell from the top.

Mr. HOLGATE.—Where was the big traveller?

Mr. ESMOND.—The big traveller was inside a little of the tenth panel—somewhere around the tenth panel.

Mr. HOLGATE.—Where was the other traveller?

Mr. ESMOND.—The other traveller was right on the outside putting on the iron.

Mr. HOLGATE.—At the extreme end of the bridge?

Mr. ESMOND.—Yes, sir. It had moved out. I do not know that I could specify the different pieces of iron by their names.

Mr. HOLGATE.—Was that the small traveller?

Mr. ESMOND.—The small traveller.

Mr. HOLGATE.—Was your attention called to the position of the locomotive?

Mr. ESMOND.—No, sir.

Mr. HOLGATE.—You do not know where it was?

Mr. ESMOND.—I do not know where it was. It seemed to me that it had run out. I know it had run out, but I did not follow it up. There are always little things falling from the work and I was away a little farther because I had to keep clear of anything that might fall, boards, or a hammer or anything. I suppose I was 100 feet below the bridge from the east side.

Mr. HOLGATE.—Did you observe anything unusual that day?

Mr. ESMOND.—No sir, nothing.

Mr. HOLGATE.—Everything was apparently the same as far as you observed as on the previous day?

Mr. ESMOND.—Yes, sir.

Mr. HOLGATE.—The operations on the bridge that you saw going on were the same as previously?

Mr. ESMOND.—To me they were all the same. Of course, I ran underneath it two or three times and I never dreamed that anything was going to happen. I could not believe my eyes when I saw it going because I would sit around it.

Mr. HOLGATE.—Then, when the accident happened, could you describe how the structure fell?

Mr. ESMOND.—I was looking up at the men—kind of looking upward and I thought I heard some sort of a noise at the shore. That took my attention and when I looked there I saw everything going. I saw, to the most of my knowledge, the head of the big traveller.

Mr. HOLGATE.—Which way did the big traveller fall? Did it fall towards the end of the span, or did it fall to the east from the west?

Mr. ESMOND.—It seemed to me to be going straight direct out, because if it had come east it would have taken me sure. It would have come right near me, or even planks or anything on top of it would have come right down on me.

Prof. GALBRAITH.—Did the locomotive go over the end of the bridge?

Mr. ESMOND.—I could not say. I heard some rumbling ashore and it took my attention from above. I looked there and I saw everything going. It just went right out.

Mr. HOLGATE.—You said you heard a noise. Was it sufficient to attract your attention?

Mr. ESMOND.—I heard like a break or something inside of me—I could not say how far from the pier—but it took my attention, and then looking up I saw everything going.

Mr. HOLGATE.—What was the noise like?

Mr. ESMOND.—Like a clap of thunder.

Mr. HOLGATE.—It was a big heavy noise?

Mr. ESMOND.—A heavy noise.

Mr. HOLGATE.—You would not describe it as a sharp crack?

Mr. ESMOND.—I could not tell because I was a little excited at the time. I heard and saw everything going.

Mr. HOLGATE.—You gave it probably no consideration at all at the time?

Mr. ESMOND.—No, because after I heard some sort of rumbling ashore, some sort of a noise like thunder I looked and I saw everything going.

Prof. GALBRAITH.—Did the bridge fall straight or did it break up before it reached the water, or did it fall altogether?

Mr. ESMOND.—It seemed that it went all in a body.

Prof. GALBRAITH.—It did not seem that it broke up before it reached the water?

Mr. ESMOND.—No, sir.

Mr. HOLGATE.—You were what was known as a life saver?

Mr. ESMOND.—Yes, sir.

Mr. HOLGATE.—Kept as a precaution against accident?

Mr. ESMOND.—In case any one would fall over I was there to pick him up.

Prof. KERRY.—What did you do when you saw the bridge fall?

Mr. ESMOND.—I had an arrangement to myself. I had a small buoy that I used to put underneath the breast hook of the boat. I do not know if I got myself clear because when it struck the water it displaced a lot of water and it made an awful swell. It came right straight to me and I did not know where I was. I sat right down there and the boat headed for the east. The next wave was not as large and when it cleared up I heard men shouting for assistance and I went to get them out.

Mr. HOLGATE.—Your boat was attached to the bridge?

Mr. ESMOND.—Yes, I was attached to the bridge and I might have done it more by habit than by presence of mind. When I heard anything on the bridge I touched the buoy and I do not know whether I knocked myself clear or the sea shifted the position of the buoy.

Prof. GALBRAITH.—Do you mean that you were fastened to a buoy at the time of the accident?

Mr. ESMOND.—I was fastened to the bridge, there was a line from the bridge and at the end of the line I had a small buoy that I used to put into the boat under the breast hook of the boat and on the top of the thwart so that it was easy to let go.

Prof. KERRY.—You did not fasten the buoy; you just put it into the boat and it held?

Mr. ESMOND.—Yes, each boat has a breast hook and I had a piece of pulp-wood attached to the line and laid over the thwart just on top so that when I touched it it would clear. I do not know whether I did that or whether it worked out.

Witness discharged.

EUGENE LAJEUNESSE, sworn.

Mr. HOLGATE.—What is your occupation?

Mr. LAJEUNESSE.—Bridge work.

Mr. HOLGATE.—What do they call you on the pay roll? Are you an erector or riveter?

Mr. LAJEUNESSE.—I work at everything; general bridge workman.

Mr. HOLGATE.—Where are you employed? Were you employed on the Quebec bridge?

Mr. LAJEUNESSE.—Yes.

Mr. HOLGATE.—Who was your foreman?

Mr. LAJEUNESSE.—Meredith.

Mr. HOLGATE.—Are there any men here who were working with you?

Mr. LAJEUNESSE.—Yes, my brother.

Mr. HOLGATE.—Your brother and you were working together?

Mr. LAJEUNESSE.—Yes.

Mr. HOLGATE.—At the time of this accident where were you working?

Mr. LAJEUNESSE.—We were on the deck.

Mr. HOLGATE.—Whereabouts; can you remember?

Mr. LAJEUNESSE.—Five panels out.

Mr. HOLGATE.—Near the anchor arm?

Mr. LAJEUNESSE.—No, on the floor beam.

Mr. HOLGATE.—On the anchor arm span or the cantilever? On the river span?

Mr. LAJEUNESSE.—Between the two piers in the centre.

Mr. HOLGATE.—Perhaps you can tell on this plan. (Witness pointed out the place on plan marked Exhibit No. 28).

Mr. HOLGATE.—Where were you at the time of the accident?

Mr. LAJEUNESSE.—I was right here—on the deck.

Mr. HOLGATE.—On the deck?

Mr. LAJEUNESSE.—Yes.

Mr. HOLGATE.—At the main post between panels 4 and 5?

Mr. LAJEUNESSE.—Yes, sir.

Prof. GALBRAITH.—Which side of the bridge?

Mr. LAJEUNESSE.—West side of the bridge.

Mr. HOLGATE.—What were you doing there?

Mr. LAJEUNESSE.—I was doing nothing there at the time I was there. I was waiting for my brother to send me a box. We worked on the top.

Mr. HOLGATE.—Show us the point where you were working?

Mr. LAJEUNESSE.—We worked here ten minutes and there five minutes cleaning up everything.

Mr. HOLGATE.—Were you putting in bolts?

Mr. LAJEUNESSE.—We were finishing up the bolting.

Mr. HOLGATE.—Were those holes empty that you were bolting up?

Mr. LAJEUNESSE.—Yes; on the post.

Prof. GALBRAITH.—What pieces were joined by these holes?

Mr. LAJEUNESSE.—Two braces at the big post.

Prof. GALBRAITH.—Do you know the chord at that place? Do you know the piece called No. 5 chord?

Mr. LAJEUNESSE.—I know one chord is bent.

Prof. GALBRAITH.—I am not asking that. Do you know the chord in the 5th panel?

Mr. LAJEUNESSE.—No, I did not look at that.

Prof. GALBRAITH.—Have you worked on the 5th chord?

Mr. LAJEUNESSE.—No, on the posts only.

Mr. HOLGATE.—What knowledge have you that made you say just now that you saw a bent chord?

Mr. LAJEUNESSE.—That was on Monday I saw that. I worked there. I bolted up on that chord, it was bent.

Mr. HOLGATE.—Which chord was that? That is on the cantilever arm?

Mr. LAJEUNESSE.—Yes.

Mr. HOLGATE.—That is out on the river?

Mr. LAJEUNESSE.—Yes.

Mr. HOLGATE.—The second from the pier on the river side or the cantilever arm?

Mr. LAJEUNESSE.—Yes.

Prof. GALBRAITH.—No. 9 on the cantilever arm?

Mr. LAJEUNESSE.—Yes.

Mr. HOLGATE.—You were at work at the time the accident happened to the bridge?

Mr. LAJEUNESSE.—Yes.

Mr. HOLGATE.—Have you any clear recollection of observing anything at the moment of the accident?

Mr. LAJEUNESSE.—No, I do not know anything about it. I made a jump and went down and I do not know anything about it. I jumped back when I saw everything going and then I fell down across a stringer, the stringer went down and I know nothing more.

Mr. HOLGATE.—What was the first notice you had of anything happening?

Mr. LAJEUNESSE.—It was nothing. I said 'I am finished'; that is all. I did not see anything.

Mr. HOLGATE.—You have told us about a chord member that you saw bent?

Mr. LAJEUNESSE.—Yes.

Mr. HOLGATE.—Did you see anything else ?
Mr. LAJEUNESSE.—That is all I saw.
Mr. HOLGATE.—How long had you been on the bridge ?
Mr. LAJEUNESSE.—Since about the 22nd of July.
Mr. HOLGATE.—Had you been pretty well over ?
Mr. LAJEUESSE.—Yes, I go everywhere on the bridge.
Mr. HOLGATE. Then that is the only thing you can speak positively about ?
Mr. LAJEUNESSE.—Yes, only that.
Mr. HOLGATE.—How was your attention called to it ?
Mr. LAJEUNESSE.—To the piece ?
Mr. HOLGATE.—Yes.
Mr. LAJEUNESSE.—I saw Mr. Yenser and Mr. Birks go there on Monday the 26th —Monday in the week of the accident.
Mr. HOLGATE.—Were you with them ?
Mr. LAJEUNESSE.—No, I worked right there. I was bolting on a strut there.
Mr. HOLGATE.—Did you know before that that this chord was bent ?
Mr. LAJEUNESSE.—No, I only saw it Monday.
Mr. HOLGATE.—When you saw Mr. Birks and Mr. Yenser there ?
Mr. LAJEUNESSE.—When we were coming from dinner we stopped—three or four of us and we looked. I saw Mr. Worley and he asked me what I was looking at. I said 'That bottom chord is bent.' Mr. Worley said : 'It is always like that'—and the whistle blew then.
Mr. HOLGATE.—Can you be sure about the location of the chord?
Mr. LAJEUNESSE.—Oh, sure.
Mr. HOLGATE.—It was on the river side ?
Mr. LAJEUNESSE.—Yes.
Mr. HOLGATE.—Of the pier?
Mr. LAJEUNESSE.—Yes, of the pier.
Mr. HOLGATE.—Out to the river?
Mr. LAJEUNESSE.—To the river, that is the one (pointing).
Prof. GALBRAITH.—And on the Quebec side?
Mr. LAJEUNESSE.—On the Quebec side it was then.
Mr. HOLGATE.—Now just describe that chord and what you saw there ?
The witness replied in French.
Mr. DAVIDSON.—He says it was plainly visible.
Mr. STUART.—It was bent towards the Quebec side and it was quite visible.
Prof. GALBRAITH.—Out from the centre line of the bridge ?
Mr. STUART.—Yes.
Mr. HOLGATE.—It was on the east side of the bridge and it was bent towards the east ?
Mr. STUART and Mr. DAVIDSON.—Towards the east.
Mr. HOLGATE.—How much was it bent, did you measure ?
Mr. LAJEUNESSE.—I did not measure, I saw it was two inches, it was bent all right because I went on the deck and looked down below and I would see.
Mr. HOLGATE.—Did you examine the chord.
Mr. LAJEUNESSE.—Yes, I was on the chord. When I came back to work I looked on the other side to see if it was bent and the other one looked all right.
Mr. HOLGATE.—That is on the Montreal side.
Mr. LAJEUNESSE.—Yes, the other I see is bent, I go to work that is all.
Prof. GALBRAITH.—Where did you see it from?
Mr. LAJEUNESSE.—From where I—rather from the strut.
Mr. HOLGATE.—Were you on the chord?
Mr. LAJEUNESSE.—Yes, only me there.
Mr. HOLGATE.—Yourself?
Mr. LAJEUNESSE.—I went on the chord to see if it was bent.
Mr. ROY.—Yes, he was there.

Mr. DAVIDSON.—He was working there?
Mr. STUART.—He was not working on it, he was working in the vicinity.
Mr. HOLGATE.—What was the condition of the lacing angles?
Mr. LAJEUNESSE.—I did not examine that, I saw only the chord bent, that is all.
Mr. HOLGATE.—There was no crack and no break, it was just a bend.
Mr. LAJEUNESSE.—On the pier?
Mr. HOLGATE.—On the chord?
Mr. LAJEUNESSE.—On no, it was only a bend, that is all.
Prof. GALBRAITH.—Were the four members of the chord bent?
Mr. LAJEUNESSE.—Oh, yes, if one were bent the others must be bent too.
Prof. GALBRAITH.—All in the same direction?
Mr. LAJEUNESSE.—All the same direction.
Prof. KERRY.—You were working on the posts?
Mr. LAJEUNESSE.—What?
Prof. KERRY.—You were working on the posts?
Mr. LAJEUNESSE.—At that time.
Prof. KERRY.—On the posts during the week?
Mr. LAJEUNESSE.—In the week, no, on the morning of that accident I was working on the front, we were reaming at that time.
Prof. KERRY.—When were you on the centre post the last time?
Mr. LAJEUNESSE.—On the centre post?
Mr. DAVIDSON.—For the last time?
Mr. LAJEUNESSE.—A week previous, the Saturday previous.
Prof. KERRY.—Were you at the bottom of it, in the shoe?
Mr. LAJEUNESSE.—Yes, I was at the bottom on the work there about 15 days back.
Prof. KERRY.—You heard them say that a plate was torn there?
Mr. LAJEUNESSE.—No, we did not see anything of that, we go all around and do not see anything.
Prof. KERRY.—It was all sound there?
Mr. LAJEUNESSE.—I guess so.
Prof. KERRY.—Everything was good?
Mr. LAJEUNESSE.—Yes, because we got some bolts there and we saw every place and we did not see that.
Prof. KERRY.—You saw the plate all right?
Mr. LAJEUNESSE.—I did not see that plate, we did not see anything bent or broken there, we did not see that.
Prof. KERRY.—But you have seen the plate yourself?
Mr. LAJEUNESSE.—It depends on which plate, there are several there. (Examining photograph.)
Mr. HOLGATE.—(Pointing to photograph). Was one of these plates crooked?
Mr. LAJEUNESSE.—I do not think so.
Mr. HOLGATE.—If there was a crack is it likely you would see it from where you were?
Mr. LAJEUNESSE.—If there was something there I would see it all right because we worked right there.
Mr. HOLGATE.—Did I understand that the plate was crimped but there was no crack in it?
Mr. LAJEUNESSE.—I saw the crimp in the plate, but there was no crack in the plate.
Mr. HOLGATE.—Have you seen the crimp?
Mr. LAJEUNESSE.—Yes.
Mr. HOLGATE.—You have seen it?
Mr. LAJEUNESSE.—Yes.

Mr. HOLGATE.—But not a crack?
Mr. LAJEUNESSE.—Oh, no.
Prof. KERRY.—You worked there a fortnight?
Mr. LAJEUNESSE.—Yes, I worked there a fortnight, my brother and myself.
Prof. KERRY.—Have you sat on the plate?
Mr. LAJEUNESSE.—Oh, yes.
Mr. HOLGATE.—Who was with you?
Mr. LAJEUNESSE.—My brother.
Mr. HOLGATE.—At the time that you saw this plate?
Mr. LAJEUNESSE.—My brother.
Mr. HOLGATE.—He was with you then?
Mr. LAJEUNESSE.—Oh, yes, we worked all the time, me and him.
Mr. HOLGATE.—Was there anybody else?
Mr. LAJEUNESSE.—Oh, no, only me and him.
Mr. HOLGATE.—Just the two of you?
Mr. LAJEUNESSE.—Oh, yes.

Witness discharged.

The Commission adjourned until 10 o'clock to-morrow (Friday) morning.

FIFTH DAY.

FRIDAY, September 13, 1907.

The Commission resumed at 10 o'clock this morning.

JAMES JOHNSON, sworn.

Mr. HOLGATE.—Are you an employee of the Phœnix Bridge?
Mr. JOHNSON.—Yes, sir.
Mr. HOLGATE.—Were you at work on August 29?
Mr. JOHNSON.—I was.
Mr. HOLGATE.—Where were you working?
Mr. JOHNSON.—I was working under the bridge down in the yard, what is known as the yard in the bridge.
Mr. HOLGATE.—In what capacity were you working there?
Mr. JOHNSON.—I had charge of the bull gang, that is the gang of labourers handling the iron.
Mr. HOLGATE.—On the ground?
Mr. JOHNSON.—On the ground.
Mr. HOLGATE.—Did your work take you on to the structure at all?
Mr. JOHNSON.—Yes, sir.
Mr. HOLGATE.—In what way?
Mr. JOHNSON.—Well, in different ways. I had different work under there, laying iron under there, pulling out the foundation out of the foundation hole.
Mr. HOLGATE.—But did your work take you on to the structure, on to the bridge?
Mr. JOHNSON.—No, I was very seldom on to the bridge.
Mr. HOLGATE.—Did you ever have to go on to the bridge in connection with your work, or was it just curiosity?
Mr. JOHNSON.—I went on to the bridge to see the foreman, and things like that; yes, but I did not have to take my gang on to the bridge at all.

Mr. HOLGATE.—It has been proved already that there was an accident upon August 29 at the bridge, did you witness that?

Mr. JOHNSON.—Oh, yes, I saw a part of it.

Mr. HOLGATE.—Where were you when that took place?

Mr. JOHNSON.—I was back there, about there.

Mr. HOLGATE.—Could you indicate on plan 26?

Mr. JOHNSON.—I was back there on the second panel on the second point, this point about here on the west side about 10 or 15 feet from the edge of the bridge; I was not right under it.

Mr. HOLGATE.—You were on the ground?

Mr. JOHNSON.—Yes.

Mr. HOLGATE.—Below that panel?

Mr. JOHNSON.—Yes.

Mr. HOLGATE.—East or west of the bridge?

Mr. JOHNSON.—West.

Mr. HOLGATE.—Ten or fifteen feet away?

Mr. JOHNSON.—Maybe fifteen, I never measured it.

Mr. HOLGATE.—West of the bridge, underneath the second panel point of the anchor span.

Mr. JOHNSON.—That is correct.

Prof. GALBRAITH.—Were you with Jos. Lefebvre?

Mr. JOHNSON.—He was working with me, the same place I was.

Prof. KERRY.—What did you actually see?

Mr. JOHNSON.—What did I see?

Prof. KERRY.—Yes.

Mr. JOHNSON.—Well, my way of seeing it, I heard the locomotive run out on it; I will tell you as near as I can what I think I saw and heard.

Prof. GALBRAITH.—Where was the locomotive?

Mr. JOHNSON.—I did not see it, I heard it running out and I heard a racket and it seemed to me like a piece of iron falling off the car or a car jumped off the track. Then I looked up and and I looked back about the third panel maybe from the pier, on the anchor span. It looked to me what I saw as if the stringers were parting. It may have been a chord or something else that I saw.

Prof. GALBRAITH.—Did you turn around when you heard the noise?

Mr. JOHNSON.—I looked up like that (indicating). I had a track gauge in my hand. I seen it coming, the next thing I done, I started to run.

Prof. GALBRAITH.—You were looking towards the main pier at that time, to the work above the main pier?

Mr. JOHNSON.—Yes, I looked up towards the main pier.

Mr. HOLGATE.—From where you stood were the two stringers distinctly visible?

Mr. JOHNSON.—They were, yes, but in looking quick like that, I just took a glance at it, I did not stop to see how it was coming or anything else, I started to run. It looked to me like the stringers had parted, like that (indicating) and was falling endwise. It looked like the stringers, it may have been trusses or chords or anything else.

Mr. HOLGATE.—That is what I meant, we can easily understand that you were not looking for anything particular at that moment, but did anything impress itself at that moment on your mind distinctly?

Mr. JOHNSON.—The impressible thing was getting out of the road about that time, I could not say anything else.

Prof. KERRY.—That was just the one movement that attracted your attention, the apparent falling of the stringers?

Mr. JOHNSON.—Yes, and then I glanced back and I see the whole thing wave, kind of rock.

Prof. KERRY.—Go ahead in your own way.

Mr. JOHNSON.—Well, I started to run. I ran out probably 30 or 40 feet and I looked again and the only thing I could see was a cloud of smoke, it was all hidden in a cloud of smoke and over the smoke I could see the wooden false work on the pier, I saw it fall back.

Prof. KERRY.—In which direction did it fall?

Mr. JOHNSON.—Back towards the shore. There was such a cloud of smoke I could just see the wooden false work standing on the pier.

Prof. KERRY.—Standing on the main pier?

Mr. JOHNSON.—Yes.

Prof. KERRY.—You saw that fall back?

Mr. JOHNSON.—Yes.

Prof. KERRY.—It fell back towards the shore?

Mr. JOHNSON.—Fell back towards the shore, yes.

Mr. HOLGATE.—Are you in a position to remember and say what part of the structure first reached the ground?

Mr. JOHNSON.—I could not say the way; I saw it start; it looked like it started where I saw those stringers fall, but I did not wait to see what part hit the ground.

Mr. HOLGATE.—That point was where?

Mr. JOHNSON.—I could not be sure about that because I looked so quick but it was in about the third point back from the pier.

Prof. KERRY.—At that point, Mr. Johnson, the stringers, if I remember right, are very considerably above the chord?

Mr. JOHNSON.—Yes.

Prof. KERRY.—So that there should not have been any confusion in your mind between the chord and the stringer?

Mr. JOHNSON.—Well I would not be sure about that now, I would not be sure about just what I did see because it happened so quick. I just took one glance at it, and I was going.

Prof. KERRY.—But at that point the chord is curving down very fast?

Mr. JOHNSON.—Yes.

Prof. KERRY.—The stringer is quite high?

Mr. JOHNSON.—The stringer is away above the chord, yes.

Prof. KERRY.—Do you remember whether among your bull gang there, Mr. Johnson, there was any one who got a really good view of the accident?

Mr. JOHNSON.—No, I do not know anyone who told me. They all were busy running, I guess, about that time.

Prof. KERRY.—They were all close under the spot?

Mr. JOHNSON.—They were all with me except one of my men, a boy, and he was killed.

Prof. GALBRAITH.—Was he under the wreck?

Mr. JOHNSON.—He was under the wreck, I had him working under there, working on some pins.

Prof. GALBRAITH.—Had any of your gang previously been working on the bridge?

Mr. JOHNSON.—Well, I do not think so.

Prof. GALBRAITH.—Or yourself?

Mr. JOHNSON.—I do not think any of them were.

Prof. GALBRAITH.—You know nothing personally about the condition of the bridge before the wreck?

Mr. JOHNSON.—No, I do not know anything about it whatever, I think it is the same as it always was.

Mr. HOLGATE.—What was the last occasion you were on the bridge, previous to this wreck?

Mr. JOHNSON.—The last occasion the morning it went down, probably about 8 o'clock.

Mr. HOLGATE.—Did you traverse the whole bridge?

Mr. JOHNSON.—Yes, clear out to the end of it, I went out to see the foreman.

Mr. HOLGATE.—Did you notice anything in your own mind that day at any particular point?

Mr. JOHNSON.—No, I saw nothing on the bridge, nothing different from what it always was, but I did not look at it, I just walked out the track, I did not pay any attention to the bridge.

Mr. HOLGATE.—I understand your duties were not of a special character on the structure, so that you made no examination yourself?

Mr. JOHNSON.—No.

Mr. HOLGATE.—So that really I understand you can give us no information in that direction?

Mr. JOHNSON.—In regard to the condition of the bridge?

Mr. HOLGATE.—From your personal knowledge?

Mr. JOHNSON.—None whatever.

Witness discharged.

INGWALL HALL, sworn.

Mr. HOLGATE.—Are you an employee of the Phœnix Bridge Company, Mr. Hall?

Mr. HALL.—Yes.

Mr. HOLGATE.—What are your duties?

Mr. HALL.—Well, whatever I am required to do as a bridge man or structural iron worker.

Mr. HOLGATE.—How are you classified on the pay roll, are you classified as an erector?

Mr. HALL.—Well, I do not know really what you mean by the word 'erector.'

Mr. STUART.—He is classified as an erector.

Mr. HOLGATE.—How long have you been in the service of the Phœnix Bridge Company on this particular work?

Mr. HALL.—Since July 5.

Mr. HOLGATE.—Since July 5, 1907?

Mr. HALL.—Yes.

Mr. HOLGATE.—Were you working on August 29?

Mr. HALL.—Yes, sir, I was working that day.

Mr. HOLGATE.—Where were you working?

Mr. HALL.—I was working on top of the traveller.

Mr. HOLGATE.—Where was the traveller?

Mr. HALL.—It was right about here (indicating on Exhibit 26).

Mr. HOLGATE.—Which traveller was that?

Mr. HALL.—The big traveller. The traveller was sitting at the end of the cantilever. Of course they had not got any further, just about here (indicating). Of course they had to leave the big traveller there to lift the little traveller over here.

Mr. HOLGATE.—The big traveller then was located on panel No. 1 of the cantilever arm?

Mr. HALL.—Yes, between 1 and 2, I cannot tell positively sure, I did not take enough notice.

Mr. HOLGATE.—But to the best of your knowledge that is where it was located?

Mr. HALL.—Panel No. 1, cantilever arm, that is as far as it went ahead.

Prof. GALBRAITH.—The front of the traveller was about the middle of panel No. 1.

Mr. HOLGATE.—There was another traveller on the bridge?

Mr. HALL.—Yes.

Mr. HOLGATE.—How was that other traveller known, what was it called?

Mr. HALL.—It is a small traveller, the small traveller we say is the cantilever traveller.

Mr. HOLGATE.—Can you say where that was at the same time?

Mr. HALL.—Well I would not say now if it was the fourth or fifth panel it was sitting on. It was sitting on the fourth panel ready to raise the fifth panel.

Mr. HOLGATE.—On the fourth panel of what you call the suspended span?

Mr. HALL.—Of the centre span, yes.

Mr. HOLGATE.—Of the centre span, the suspended span.

Mr. STUART.—I think that is not quite accurate, it was on the third ready to raise the fourth, that is what Mr. Milliken tells me.

Mr. HALL.—I would not be sure about that because I was not working that morning.

Mr. HOLGATE.—It was there anyway, you are not quite sure whether on the third or fourth panel?

Mr. HALL.—No.

Mr. HOLGATE.—And Mr. Millikin would know definitely about that?

Mr. HALL.—Yes.

Mr. HOLGATE.—Now, at the time of the accident, where was the locomotive?

Mr. HALL.—I could not tell, I did not notice it.

Mr. HOLGATE.—You cannot locate the locomotive?

Mr. HALL.—No, I cannot locate the locomotive.

Mr. HOLGATE.—Do you remember it was on the bridge at all?

Mr. HALL.—To tell the truth I do not remember it was on the bridge at all, because I did not notice it.

Mr. HOLGATE.—What was the big traveller doing at the time of the accident?

Mr. HALL.—Well one of the booms on the Montreal side was hoisting up a couple of timbers, had hoisted them up and was just landing two timbers.

Prof. GALBRAITH.—Big timbers?

Mr. HALL.—Yes, it was getting ready to move the derricks down on the boat like. They call it the boat, right under the top girders, and it was just landed.

Mr. HOLGATE.—At the time of the accident?

Mr. HALL.—At the time of the accident, yes.

Mr. HOLGATE.—Where were you on the traveller at the time of the accident?

Mr. HALL.—I was on the Quebec side, on the boat, what we call the boat of the traveller.

Prof. GALBRAITH.—On the big traveller?

Mr. HALL.—Yes, right below the top girders.

Prof. KERRY.—The traveller was actually being taken down on that day?

Mr. HALL.—Yes, sir.

Mr. HOLGATE.—Was it being dismantled, do you mean?

Mr. HALL.—Well we took some sheave boxes and some pins and a couple of boat loads of bolts were lowered down.

Prof. KERRY.—Had you just commenced taking it down?

Mr. HALL.—No, we started Friday morning

Prof. KERRY.—You started on Friday morning to take down the traveller?

Mr. HALL.—To take down the sheave boxes. Well there was part of the traveller taken down before, the outrigger of the traveller, that was all taken off.

Prof. GALBRAITH.—When was that taken off?

Mr. HALL.—Oh, two weeks before that we had been working on it.

Prof. GALBRAITH.—In the two weeks before?

Mr. HALL.—Yes.

Prof. GALBRAITH.—And only the main floor of the traveller was standing?

Mr. HALL.—Only the main floor of the traveller was standing, yes, and two heavy girders on top to amount to anything of real heft on the traveller.

Prof. GALBRAITH.—What did they belong to?

Mr. HALL.—They belonged to strengthen the traveller on top.

Mr. HOLGATE.—As this material was taken down, that is material belonging to the traveller, was it left on the bridge close to the traveller?

Mr. HALL.—It was left down below on the bars on the top bars of the bridge; that is for a few days, then it was rigged up and we took them off there and lowered them down to the water on a flat boat and they were taken away to the other side.

Prof. GALBRAITH.—What was the main traveller resting on, the top or bottom of the bridge?

Mr. HALL.—It was resting on the bottom, the bottom chords.

Prof. KERRY.—Were the hoisting engines taken down?

Mr. HALL.—There never was an engine on top of the traveller, they were below.

Prof. KERRY.—They were on the floor, were they?

Mr. HALL.—They were on the floor.

Prof. KERRY.—What did you notice first when the accident happened, Mr. Hall?

Mr. HALL.—Well in the position I was I could not look back on the bridge very far because I had a big girder right in front of me and there was only a space of three feet before the eyes there so I could not see very much. I mean to say I could not mention anything just as she started to go down.

Prof. GALBRAITH.—What part of the traveller were you on?

Mr. HALL.—On the Quebec side.

Prof. GALBRAITH.—No, I mean how high up on the traveller?

Mr. HALL.—I did not measure it myself but I heard it is about 400 feet from the water.

Prof. GALBRAITH.—What part of the traveller were you on, the upper part?

Mr. HALL.—I was ten feet below the top.

Prof. GALBRAITH.—And near the front or near the back?

Mr. HALL.—Near the front.

Prof. KERRY.—You knew there was something wrong just by feel and not by sight?

Mr. HALL.—Well I could feel it start to go down and it was going down fast you got tears in your eyes, and you could hardly realize anything beside you. My partner was just about 7 or 8 feet from me, and I never noticed him and never saw him never knew anything.

Prof. GALBRAITH.—How did it go at first?

Mr. HALL.—At first it did not make an awful noise when it started.

Prof. GALBRAITH.—Did it go slowly or fast?

Mr. HALL.—No, it went kind of fast at the start till it struck the deck of the bridge, then it seemed to me it kind of slowed up a little bit.

Prof. GALBRAITH.—How do you mean till it struck the deck?

Mr. HALL.—Till it struck the deck, till the deck struck the water, then it seemed to slow up.

Prof. GALBRAITH.—After it struck the water?

Mr. HALL.—After it struck the water, that is it slowed up gradually like, it did not go as fast as before.

Prof. KERRY.—You went down on the traveller all the time?

Mr. HALL.—Yes, I was staying there all the time, that same position.

Prof. GALBRAITH.—The traveller did not upset?

Mr. HALL.—No, the traveller stayed right there. It was fastened to the top chords a few days before, it was fastened for safety to keep the traveller steady to lower the girders, and that helped a good deal to hold it in place.

Prof. GALBRAITH.—It was the full width of the bridge?

Mr. HALL.—Yes, it was extended out 20 feet on each side of the bridge.

Prof. GALBRAITH.—Did you lose consciousness?

Mr. HALL.—No, sir, I did not.

Prof. GALBRAITH.—You were conscious until you came to the top of the water afterwards?

Mr. HALL.—Well, yes, I was.

Prof. GALBRAITH.—When you came to the top of the water was everything out of sight in that neighbourhood?

Mr. HALL.—Everything was out of sight except timbers, and I do not know how many voices were hollering for help, that is all.

Prof. GALBRAITH.—Around you?

Mr. HALL.—Around me, yes. The water was too unruly for me to notice how many.

Prof. GALBRAITH.—That is rough?

Mr. HALL.—Yes, it seemed as though it was going fore and back in small waves so you would have to hoist yourself up to the chest to breathe without drinking water.

Prof. GALBRAITH.—Where were you injured?

Mr. HALL.—I got two fingers taken off, and the third the flesh taken off.

Prof. GALBRAITH.—You were able to swim?

Mr. HALL.—Yes, I was able to swim.

Mr. HOLGATE.—Do you remember which way you were facing when this took place?

Mr. HALL.—I was facing towards the shore.

Mr. HOLGATE.—The south shore?

Mr. HALL.—Yes, towards the pier, from the water towards the pier.

Prof. GALBRAITH.—Have you any recollection of how the bridge went down? Did it go down in one piece or not, the cantilever end?

Mr. HALL.—Well I would not positively say, but it was nothing that broke close by where the traveller was because it was going down too steady for that. It seemed just like it was tipping on an axle like, on the pier; that is the way it seemed to me.

Mr. HOLGATE.—That clearly represents your idea?

Mr. HALL.—Yes, sir.

Mr. HOLGATE.—Were you in any way generally familiar with the whole bridge? Your duties on the traveller, were they continuous, were you always working on the traveller?

Mr. HALL.—No, I was driving rivets for a while.

Mr. HOLGATE.—How long had you been working on the traveller prior to this accident?

Mr. HALL.—I should judge about a month.

Mr. HOLGATE.—In doing that you would have to traverse the bridge in the morning; how did you get to the traveller?

Mr. HALL.—To the traveller?

Mr. HOLGATE.—Yes, did you walk out to the traveller?

Mr. HALL.—Yes, I walked out and walked up the angles.

Mr. HOLGATE.—And then you would go back at dinner time?

Mr. HALL.—Back at dinner time.

Mr. HOLGATE.—And out at 1 o'clock?

Mr. HALL.—Out at 12.45.

Mr. HOLGATE.—And return to the shore at six?

Mr. HALL.—At six.

Mr. HOLGATE.—So when working on the traveller you went over that bridge four times a day?

Mr. HALL.—Yes.

Mr. HOLGATE.—Did you ever notice anything particular in the condition of the bridge on those trips, anything that called your attention especially to——

Mr. HALL.—No, not that I saw myself, but I heard some talk about what had been brought up about that bottom chord. There was quite a few the night before went down and looked up there and they said: That is kinking in from the heft of the wind.

Mr. HOLGATE.—Do you know what bottom chord they were talking about?

Mr. HALL.—On the Montreal side, I do not know what position it was in really.

Mr. HOLGATE.—And you know nothing of your own knowledge?

Mr. HALL.—No, I did not see it.

Mr. HOLGATE.—You did not see it?

Mr. HALL.—No, I was just taking the word of my room mate, Harry Briggs, who got lost.

Mr. HOLGATE.—Are any of those men to whom you refer at present working for the company, are they survivors?

Mr. HALL.—Why there is one with me over in the hospital in Levis; he is known as Alexander Beauvais.

Mr. HOLGATE.—Anybody else?

Mr. HALL.—No, I guess all the rest are dead.

Mr. HOLGATE.—So that whatever information you got was from Beauvais?

Mr. HALL.—Yes, he told me about his work, where he was working. He was riveting on the first point.

Mr. HOLGATE.—All I want to know is that is your source of information and your only source of information?

Mr. HALL.—Yes.

Mr. HOLGATE.—And you know nothing of it personally?

Mr. HALL.—No.

Mr. HOLGATE.—And is that the only point that was brought to your attention?

Mr. HALL.—Well, yes.

Prof. GALBRAITH.—Did you ever notice any unusual springing up and down on the bridge while you were on the traveller?

Mr. HALL.—The last half day, the last few hours, I might say, it was awful springy, and of course we had some iron lowered on the bridge which was laying on the deck of the bridge and they were using the boom from the traveller that I was on to hoist it up from the bridge and laid it on flat cars, and every time they dropped on the cars why it seemed as though it would spring down about a foot under you.

Prof. GALBRAITH.—How much of a drop was there from the fall to the flat car?

Mr. HALL.—Well, it would not be more than may be a foot or so.

Prof. GALBRAITH.—What kind of pieces were being loaded?

Mr. HALL.—Oh they were the sheave boxes.

Prof. GALBRAITH.—This was for the traveller?

Mr. HALL.—For the traveller.

Prof. GALBRAITH.—Was any part of the bridge being loaded by the traveller at that time?

Mr. HALL.—No, sir.

Prof. GALBRAITH.—How far up and down would you estimate the spring owing to this loading?

Mr. HALL.—Well, I could not mention exactly.

Prof. GALBRAITH.—I want to know whether it was an inch or a foot?

Mr. HALL.—No. It could not go down a foot because if it did we would not come up.

Prof. GALBRAITH.—I want your idea exactly.

Mr. HALL.—Well it would jar enough so you would notice it good and plain and you would feel afraid; you would feel the shock every time they dropped anything.

Prof. GALBRAITH.—Did you notice while you were on this traveller, any side motion, as well as the up and down motion?

Mr. HALL.—No.

Prof. GALBRAITH.—Do you know that the motion was up and down?

Mr. HALL.—Yes.

Prof. GALBRAITH.—You could tell that?

Mr. HALL.—Yes, that is the way it felt for us up there.

Prof. GALBRAITH.—This occurred how long before the accident?

Mr. HALL.—Oh this was about within an hour or two hours before the accident happened.

Prof. GALBRAITH.—Have you noticed that swinging or a similar swinging any time before that?

Mr. HALL.—No, sir, not as bad, hardly any at all.

Prof. GALBRAITH.—You always felt the traveller safe until the time you speak of, a short time before the acident?

Mr. HALL.—Yes, while it felt shaky—of course this was light iron, I do not think these little pieces were half a ton even.

Prof. GALBRAITH.—That you refer to?

Mr. HALL.—Yes, that were loaded on the cars.

Prof. GALBRAITH.—At the time?

Mr. HALL.—Yes, it was not half a ton heft, no, it was not a quarter of a ton you might say.

Prof. GALBRAITH.—You had work on the traveller when the cranes extended outwards towards the end of the bridge were on, and when heavy pieces of iron were being unloaded from the cars on to the bridge?

Mr. HALL.—Yes.

Prof. GALBRAITH.—And did you notice any motion of the traveller that felt unsafe up to that time?

Mr. HALL.—No, sir.

Mr. HOLGATE.—Do you recollect that the engine was out far on the bridge that same day during the morning or at any time with some carloads of material?

Mr. HALL.—No, not any further than the traveller.

Mr. HOLGATE.—It was up as far as the traveller?

Mr. HALL.—Up as far as the traveller, yes.

Mr. HOLGATE.—And had the engine ever been any further than that before?

Mr. HALL.—That is something I could not answer because I do not recollect.

Mr. HOLGATE.—Do you recollect what that engine was taking out there, how many cars it had with it?

Mr. HALL.—It generally had two cars.

Mr. HOLGATE.—On this occasion were they loaded?

Mr. HALL.—No, empty.

Mr. HOLGATE.—I am speaking now of the morning of the same day?

Mr. HALL.—Well, I did not notice whether they had any cars or engines out there in the forenoon, or the afternoon really, but as I say the engine was out as far as the traveller, but whether it went any further that day I do not know, that is I cannot recollect seeing it or noticing it.

Mr. HOLGATE.—When the engine was out there at any time during that day did you notice that vibration in the bridge up and down?

Mr. HALL.—No.

Mr. HOLGATE.—So that the only time you noitced it was a short time before?

Mr. HALL.—When I was loosening the lines on the traveller I was working on.

Mr. HOLGATE.—And at that time the engine was not on the bridge?

Mr. HALL.—That is, not in my memory, what I seen.

Mr. HOLGATE.—Well, now, who else is there that could give us information clearly on that point?

Mr. HALL.—Oscar Lebarge. He is laid up. He has got a fractured jaw and an injured leg.

Prof. GALBRAITH.—Did you notice the behaviour of the centre posts at any time during the fall?

Mr. HALL.—Everything seemed good and solid to me—no failure that I noticed.

Prof. GALBRAITH.—I mean during the accident.

Mr. HALL.—During the accident?

Prof. GALBRAITH.—You could not say?

Mr. HALL.—I could not say.

Prof. GALBRAITH.—You could not see the beginning of the fracture of the main posts?

Mr. HALL.—No, sir.

Witness discharged.

Mr. D. B. HALEY, sworn.

Mr. HOLGATE.—Are you an employee of the Phœnix Bridge Company?

Mr. HALEY.—Not at present; I was discharged. I was, though.

Mr. HOLGATE.—When did you enter their service in connection with the work at the Quebec bridge?

Mr. HALEY.—On June 18.

Mr. HOLGATE.—1907?

Mr. HALEY.—June 19. I came here on June 18, and went to work on June 19, 1907.

Mr. HOLGATE.—In what capacity were you working?

Mr. HALEY.—As an all-round bridge man.

Mr. HOLGATE.—When did you leave the service of the company?

Mr. HALEY.—I was discharged.

Mr. HOLGATE—When were you discharged?

Mr. HALEY.—After this accident.

Mr. HOLGATE.—That was when?

Mr. HALEY.—August 29.

Mr. HOLGATE.—You have not worked since?

Mr. HALEY.—No.

Mr. HOLGATE.—But you were in their employ on August 29?

Mr. HALEY.—Yes.

Mr. HOLGATE.—Where were you working on August 29?

Mr. HALEY.—On the top chord traveller, where I always worked.

Mr. HOLGATE.—Where was it at that time?

Mr. HALEY.—(Referring to plan marked Exhibit No. 26.) It was right up here. The jib was overhanging out here and I was on the extreme end of the jib.

Mr. HOLGATE.—Just indicate where you were.

Mr. HALEY.—It was the fourth panel. We were standing near the third panel and I was out over the fourth panel. The jib rests over this and I was out on the end of it.

Prof. GALBRAITH.—What did that panel rest on?

Mr. HALEY.—On the upper chord of panel No. 3.

Mr. HOLGATE.—When the accident happened what was being done on that traveller, and where were you?

Mr. HALEY.—I was on the extreme end of it. I had been doing some rigging out there. There was not much of anything being done, we were waiting for iron to come out, there was a little lull for half an hour and I was doing a little job that I had been waiting for a slack time to do.

Mr. HOLGATE.—You say that you had continuously worked on this traveller?

Mr. HALEY.—I was signal man and any time there was anything to do I was kept there busy. Then it was slack and I was out there doing a little job on the rigging.

Mr. HOLGATE.—Since the time that you went there on June 19, you worked continuously?

Mr. HALL.—Yes, sir.

Mr. HOLGATE.—Every day that the weather would permit?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—And always on that traveller?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—When the accident happened have you any clear recollection of what did happen?

Mr. HALEY.—Yes, sir, I have a very clear recollection of what did happen.

Mr. HOLGATE.—Just, shortly, in your own words, tell us what you saw.

Mr. HALEY.—I was on the extreme end of it and the first thing I knew I caught myself going through the air. I realized that the iron fell very much faster than I did and left me falling through the air. The next thing I remember I was deep in

water. In a short time I came up—I swam up—some planks came up around me, I got on the planks and was rescued by a boat on the other side of the river twenty minutes or so afterwards, or as soon as they could get over.

Mr. HOLGATE.—Had you a view of the structure behind you, as it was falling?

Mr. HALEY.—No sir, none whatever and heard no noise. I was in the water before the noise came.

Prof. GALBRAITH.—You were fully conscious during the whole of the time until you came to the top of the water?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—You hung on to this jib as you were falling?

Mr. HALEY.—I hung on to nothing. What I was sitting on fell away from me and I fell through space. The only thing I hung on to was the plank that I got hold of when I came up.

Prof. GALBRAITH.—Do you know whether the jib fell faster than you fell; or whether you passed it?

Mr. HALEY.—The jib fell faster than I did. I remember that all right.

Mr. HOLGATE.—From what you know was it the whole general structure or something of any local nature where you were working that fell? Did the whole structure fall as one or are you in a position to say anything at all about that?

Mr. HALEY.—The way it appeared to me was that it broke off and let that part go down and the way I accounted for not hearing any noise was that the anchor arm fell afterwards, after the balance had gone.

Prof. GALBRAITH.—What do you mean by saying that part falling off?

Mr. HALEY.—I mean the whole cantilever arm.

Mr. HOLGATE.—Did your duties take you to any other part of the bridge?

Mr. HALEY.—No, sir.

Mr. HOLGATE.—But you passed over the bridge, probably, four times a day?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—In passing over have you, at any time, noticed anything extraordinary?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—Was your attention called to it or did somebody draw it to your notice?

Mr. HALEY.—My attention was called to it by somebody, and then I went down and looked at it.

Mr. HOLGATE.—Who called your attention to it?

Mr. HALEY.—My partner, Mr. Cook, who is now dead.

Mr. HOLGATE.—When your attention was called to this particular thing you examined it?

Mr. HALEY.—Yes, sir. We decided that right when the whistle blew that night we would go down and look at it. That was on August 28.

Mr. HOLGATE.—Was there only one point or more than one point?

Mr. HALEY.—Our attention was called to one point and we examined several points and found several points defective, too.

Mr. HOLGATE.—Beginning with the point that Mr. Cook pointed out to you can you designate accurately what that was?

Mr. HALEY.—Yes.

Mr. HOLGATE.—Can you show it on this plan? (Referring to plan marked Exhibit No. 26.)

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—How do you know these parts—by their erection numbers?

Mr. HALEY.—I am not very well acquainted with the erection numbers. I had nothing to do with the erection numbers. I only did as I was told. I know the names of the different sections.

Mr. HOLGATE.—Just indicate on this plan. (The witness indicated the splice marked No. 9 on the Quebec side of the cantilever arm of the lower chord).

Mr. HOLGATE.—Is that it?

Mr. HALEY.—Yes, sir, that is what my attention was called to.

Mr. HOLGATE.—Did you examine it?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—What did you find?

Mr. HALEY.—I found that it was bulging out on both sides.

Mr. HOLGATE.—The splice was?

Mr. HALEY.—Near the splice and the splice itself as well.

Prof. GALBRAITH.—Which chord?

Mr. HALEY.—On the Quebec side.

Prof. GALBRAITH.—You say it was bulging out? Is that the splice? What was bulging out?

Mr. HALEY.—This chord.

Prof. GALBRAITH.—That is the chord of panel 8?

Mr. HALEY.—Yes.

Prof. KERRY.—What was bulging actually? What part of the splice?

Mr. HALEY.—All the webs and the chord. There were four webs and this chord, two outside ones and two centre ones and they were all giving way. The two outside ones were going out.

Prof. GALBRAITH.—From the centre of the bridge?

Mr. HALEY.—Yes, sir.

Prof. KERRY.—Then you say that all four webs were bending towards Quebec?

Mr. HALEY.—No, the inside web was bending towards Montreal and the outside web bending towards Quebec, showing that there was too much compression put on and it would not stand the strain and it was giving.

Prof. KERRY.—And the centre webs were comparatively slight, were they?

Mr. HALEY.—No, they were not. They showed the wobble.

Prof. KERRY.—The centre webs were twisted like that (indicating)?

Mr. HALEY.—Exactly.

Mr. HOLGATE.—I do not think that is what he said.

Prof. KERRY.—We understand that the web on the Quebec side was bent out towards Quebec?

Mr. HALEY.—That is what I said.

Prof. KERRY.—The web on the Montreal side was bent out towards Montreal?

Mr. HALEY.—Yes, sir.

Prof. KERRY.—And the two centre webs were bent into a very long S shape?

Mr. HALEY.—Yes, as close as you can get at it.

Prof. KERRY.—What did the lacing show?

Mr. HALEY.—It was bent down in one space and up in another space. Some of it showed a bend sideways and kinked.

Prof KERRY.—The lacing was bent in different ways?

Mr. HALEY.—Yes, sir, in between the rivets. Across from one web to the other one lacing would be bent down and the next bent up and several of these showed a bend.

Prof. GALBRAITH.—What distance along this chord No. 8 did you see the lacing in that shape?

Mr. HALEY.—At that particular point, about four feet.

Prof. GALBRAITH.—That would cover this whole panel of lacing—about one square of lacing?

Mr. HALEY.—Yes.

Prof. GALBRAITH.—You did not see any other squares of lacing which were bent?

Mr. HALEY.—Not at that point.

Mr. HOLGATE.—This examination was made at what hour and on what day?

Mr. HALEY.—A quarter past six on August 28.

Prof. GALBRAITH.—You are speaking of the lacing on chord 8?

Mr. HALEY.—Yes, sir.

Mr. GALBRAITH.—Next to the cover plate and the joint?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—Did you make an inspection of it afterwards? Did you see it again?

Mr. HALEY.—No, I never saw it any more.

Prof. KERRY.—When did Mr. Cook see it first?

Mr. HALEY.—Mr. Cook saw it the same time I did.

Prof. KERRY.—Did he mention it to you? He had seen it previously?

Mr. HALEY.—He had been told about it previously.

Prof. KERRY.—Who told him?

Mr. HALEY.—Mr. Britton.

Prof. KERRY.—Is he alive still?

Mr. DAVIDSON.—Yes, he is here.

Prof. KERRY.—You say that the webs of the chords were bent close to the cover plate on the 8th chord and you also say that there was a bend at the joint. What was there at the joint?

Mr. HALEY.—The splice showed that the webs had never fitted up close like they showed. They showed warped beside the cover plate where it had been riveted on.

Prof. KERRY.—It was buckling up, like?

Mr. HALEY.—Where they meet together they do not meet flush?

Prof. GALBRAITH.—They were open more in one part than in another?

Mr. HALEY.—At the bottom corner one stuck out ⅝ or a ¼ of an inch.

Prof. GALBRAITH.—Sideways?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—Were the side cover plates not opposite?

Mr. HALEY.—That is what I am speaking of.

Prof. KERRY.—That is to say that the two sections would be something like that? (indicating.)

Mr. HALEY.—Yes, they did not meet evenly.

Prof. KERRY.—How were the cover plates fastened at that time?

Mr. HALEY.—The splice was all riveted up.

Prof. KERRY.—And the webs of the two adjacent pieces were not in line?

Mr. HALEY.—No, sir.

Prof. KERRY.—Was the cover plate bent?

Mr. HALEY.—Yes, it showed a bend right at the splice.

Prof. KERRY.—It had been actually hammered in together in contact and then riveted?

Mr. HALEY.—Exactly; drawn in and jacked in until the metal was in contact and then riveted,

Prof. GALBRAITH.—Was there a similar appearance in the case of the inside splice or the cover plate on the other side of the girder?

Mr. HALEY.—It is the splice plates I refer to on both sides.

Prof. GALBRAITH.—How many splice plates are there in the whole chord?

Mr. HALEY.—Eight. There are four webs and two splice plates for each web.

Prof. GALBRAITH.—You are testifying now to Mr. Kerry about the condition of the outside splice plate? That is what your previous testimony has been in reference to?

Mr. HALEY.—The outside and inside, both.

Prof. GALBRAITH.—I am asking you about the inside. Were all of the splice plates—the eight splice plates you say were in that joint—deformed sideways?

Mr. HALEY.—I did not look at the inside ones. In order to do that you would have to get down and look up and there was no scaffold.

Prof. GALBRAITH.—They were covered so that you could not see them?

Mr. HALEY.—No, sir.

Prof. GALBRAITH.—You saw nothing on the inside splice plates?

Mr. HALEY.—At that time.

Prof. GALBRAITH.—You are clear on that?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—I understood you to say a little while ago that the inside splice plates were displaced. You withdraw that? You are not sure?

Mr. HALEY.—If you understand me right——

Prof. GALBRAITH.—We do not understand each other perhaps.

Mr. HALEY.—I am speaking of the inside web and the outside web. There are two centre webs. I did not look at them because you have to have a scaffold to look at them from underneath. There was no scaffold and consequently I did not look at them. But I had seen that splice. I had noticed it previously.

Prof. GALBRAITH.—And if there is anything taken down in the evidence referring to the splicing of the inside webs, you withdraw it? You say nothing about that?

Mr. HALEY.—Yes.

Prof. GALBRAITH.—That is what I want to get clear.

Prof. KERRY.—Going back to the fact that the webs and the two members on each side of the splice did not line have you any idea whether that was there when the member was put up? And if so, for how long?

Mr. HALEY.—On August 8 I was down there. I was not here when the member was put up. I walked down from that bottom chord right down to the shoe and I noticed that there was a great change between August 8 and August 28.

Prof. KERRY.—You did not notice anything wrong at all in that member or in that joint on August 8?

Mr. HALEY.—I say yes; decidedly so. I noticed a great difference.

Prof. KERRY.—But on August 8 did it look all right?

Mr. HALEY.—No, it did not.

Prof. KERRY.—What looked wrong on August 8?

Mr. HALEY.—The plates were lying off on a scaffold. They were about to be riveted up. They were trying to get it in position to rivet it and they had four jacks there and they were trying to get these webs together flush so that they could rivet it.

Prof. GALBRAITH.—That is flush sideways?

Mr. HALEY.—Yes. That was August 8, and I did not see it any more till August 28. It was all riveted up then.

Prof. KERRY.—Were all the inside ribs out of line?

Mr. HALEY.—Yes.

Prof. KERRY.—It was all uncovered when you were there?

Mr. HALEY.—Yes, sir.

Prof. KERRY.—Was each web on one side of a joint opposite each corresponding web on the other side of the joint?

Mr. HALEY.—No, they were not clear past, but they were projecting about half an inch.

Prof. KERRY.—Was each case the same way. Take the two webs on the Quebec side; we will say that one is projecting half an inch towards Quebec. Then, take the centre web; would that also be projecting half an inch towards Quebec?

Mr. HALEY.—Not necessarily. I noticed that. In one case two went one way and in the other case two were divided, one each way.

Prof. KERRY.—I think we might ask the witness to make a sketch showing how these did lie in the two cases. (Witness made a sketch which was filed and marked Exhibit 27.)

Prof. KERRY.—Jacks were being used to bend the cover plates in.

Mr. HALEY.—Jacks were being used right in between these webs to shove them together.

Prof. KERRY.—I notice that sections A, C and D of the 9th chord are shown in the sketch (Exhibit 27) as projecting towards Quebec and section B of the same chord is shown projecting towards Montreal. Is this correct?

Mr. HALEY.—That is correct?

Mr. HOLGATE.—Have you anything explaining that apparent discrepancy?

Mr. HALEY.—Too much weight being put on before the point was riveted.

Mr. GALBRAITH.—Is that your full answer to that question?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—What about the cover plate at that time?

Mr. HALEY.—It was not riveted—just bolted or partially bolted on the bottom.

Prof. GALBRAITH.—That cover plate was on chord No. 8?

Mr. HALEY.—Yes.

Prof. GALBRAITH.—Riveted?

Mr. HALEY.—No.

Mr. HOLGATE.—We are speaking of this on the 8th or 28th of August.

Mr. HALEY.—On the 8th.

Prof. GALBRAITH.—How did you measure these displacements you speak of?

Mr. HALEY.—With a rule.

Prof. KERRY.—These are actual measurements?

Mr. HALEY.—Yes, sir.

Prof. KERRY.—That was the only measurement you made, Mr. Haley?

Mr. HALEY.—The only measurement I made.

Prof. KERRY.—We have not yet examined the plans of the bridge. Were there any of the splice plates connected to the member when it arrived or were they all fastened to both members at the bridge?

Mr. HALEY.—I do not know how they arrived from the shops.

Prof. KERRY.—At the time of your inspection on August 8, were any of the joint plates riveted to the chord members?

Mr. HALEY.—No.

Prof. KERRY.—How many were in place and how were they fastened?

Mr. HALEY.—They were fastened by bolts and the splices placed inside and the ones on the outside as well. The splice was about two-thirds bolted up on the outside. Some holes had nothing in them at all.

Prof. KERRY.—And the inner splices?

Mr. HALEY.—I did not notice how many bolts were in them. It was dark up there.

Mr. HOLGATE.—Were there bolts in them at all?

Mr. HALEY.—Yes, there were some bolts up there.

Prof. KERRY.—Were the upper and lower cover plates in place?

Mr. HALEY.—The lower cover plate was lying on the scaffold and the upper one was in its place.

Mr. HOLGATE.—You had to see the joint from the scaffold?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—The upper cover plate was bolted?

Mr. HALEY.—I do not know how the upper plate was put on. I got right down underneath and laid down on my back and measured these points and looked up there.

Prof. GALBRAITH.—You measured from underneath?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—Why did you not do it from the upper side?

Mr. HALEY.—The cover plate was put on. I could not see anything.

Prof. GALBRAITH.—Bolted or riveted?

Mr. HALEY.—I do not remember. It must have been bolted.

Prof. GALBRAITH.—The lower cover plate was completely off?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—And the side splice plates were in position?

Mr. HALEY.—Yes, sir; that is, they were hanging loosely—not exactly loosely either, but they were not full of bolts. The riveters had been there and were in the act of tightening them up and trying to get them in place.

Prof. GALBRAITH.—Did you make a careful count of the number of these spliced ones?

Mr. HALEY.—No.

Prof. GALBRAITH.—I am not speaking of the bolts now. I am speaking of the plates themselves. Did you make a careful count of the number of splice plates on the sides of the rib?

Mr. HALEY.—No.

Prof. GALBRAITH.—Are you sure as to the number of them?

Mr. HALEY.—No, I am not sure whether there were two plates on the outside or one.

Prof. GALBRAITH.—Since that has that doubt entered your mind?

Mr. HALEY.—I never looked closely.

Prof. GALBRAITH.—You testified a few moments ago that there were eight splice plates.

Mr. HALEY.—There were 4 webs. I took it for granted that there would be 8 splice plates.

Prof. GALBRAITH.—But you had an opportunity of seeing them?

Mr. HALEY.—I know.

Prof. GALBRAITH.—You were testifying to what you had seen and you testified that there were 8 spliced plates?

Mr. HALEY.—Yes.

Prof. GALBRAITH.—Do you still testify to that effect?

Mr. HALEY.—I could not swear as to whether there were 8 spliced plates or not because I did not count them.

Mr. HOLGATE.—And yet you measured these variations with a rule?

Mr. HALEY.—Yes, sir; there were three of us and we noticed it in particular.

Prof. KERRY.—Will you mention the other two?

Mr. HALEY.—The other two are Mr. Joe Ward and Mr. George Cook.

Prof. KERRY.—Were they both in the accident?

Mr. HALEY.—Yes.

Mr. DAVIDSON.—No, Mr. Ward was drowned before.

Mr. HALEY.—Mr. Ward was drowned about two weeks before.

Mr. DAVIDSON.—They were both drowned?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—Are you sure about the direction of the displacement up or down the river that you have shown on this plan?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—Absolutely?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—You cannot remember about that upper cover plate. You say that it was in position; you cannot remember whether the whole of it or part of it was riveted?

Mr. HALEY.—I did not notice at all particularly. I jumped right down on the scaffold and looked at the bottom.

Mr. HOLGATE.—Was this variation that you have seen here the same all the way up the chord?

Mr. HALEY.—No, it was not so bad at the top. It was dark up at the top, and it seemed as if it ran out.

Mr. HOLGATE. If that variation existed on the top of the chord would it have been possible to have had the cover plate bolted up?

Mr. HALEY.—I do not think it would—not that much in.

Mr. HOLGATE.—How much variation in the abutting of these chord sections would be possible if the upper cover plate were bolted to both sections of the chord? How much variation would there be in the holes to permit of any slight variation?

Mr. HALEY.—The bottom could swing half an inch over and the top cover plate would hold.

Mr. HOLGATE.—How much variation on the top?

Mr. HALEY.—There could not be any.

Mr. HOLGATE.—Were the conditions such that they must have abutted properly on the top?

Mr. HALEY.—Pretty nearly so.

Mr. HOLGATE.—Then this variation you have marked on Exhibit 27 is the maximum divergence at the bottom?

Mr. HALEY.—Exactly.

Mr. HOLGATE.—Diminishing to nothing at the top?

Mr. HALEY.—It looked that way. It was dark up there and it looked to run out.

Mr HOLGATE.—Then you mean that there was a twist in one or other of these chord sections?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—Would you call that a wind?

Mr. HALEY.—Yes, a little wind in it. Instead of calling it a wind, it would seem more proper to say that it kicked to one side.

Mr. HOLGATE.—If it had done that would not that exist in the next joint of No. 9?

Mr. HALEY.—The next panel, you mean?

Mr. HOLGATE.—Yes?

Mr. HALEY.—In the splice down here (indicating)?

Mr. HOLGATE.—Yes?

Mr. HALEY.—I do not know that it is necessary for it—no. This is the panel point (indicating). I walked down the lower chord to the main pier and right up the other side, and my reasons for doing so were that I had never been there before. I simply went to see that big pin and big shoe, as I expected to quit—to leave the job.

Prof. KERRY.—The ribs of the chord were built of three pieces?

Mr. HALEY.—I do not know whether they were or not.

Prof. KERRY.—Were they tight together, or did you notice any bending in the rib?

Mr. HALEY.—They were tight together.

Prof. KERRY.—The rib itself was——?

Mr. HALEY.—Intact.

Prof. KERRY.—Intact?

Mr. HALEY.—I do not know whether there were three pieces or five pieces. You have to look very closely to tell how many pieces there are when they are tight together.

Mr. HOLGATE.—I was asking a little while ago when you discovered the joint illustrated on your sketch (Exhibit No. 27), did you examine the next joint in the chord in either direction?

Mr. HALEY.—No, sir; I walked straight down to the shoe. It is August 8 I refer to now.

Mr. HOLGATE.—Did it not occur to you that if one or other of these were out of place, in the shape in which you describe it, you might find something to explain it in the next joint?

Mr. HALEY.—All the explanation I wanted was the extreme load on the end of it and the point not riveted up.

Mr. HOLGATE.—As a matter of fact, you did not examine the other joints?

Mr. HALEY.—No, sir.

Mr. HOLGATE.—From where you were did you observe anything in either of these joints, or any other joint, or anything else, that in your mind was not correct?

Mr. HALEY.—Not on August 8.

Mr. HOLGATE.—Did you on August 28?

Mr. HALEY.—Yes.

Mr. HOLGATE.—From this point?

Mr. HALEY.—Yes.

Mr. HOLGATE.—That is panel point No. 9?

Prof. KERRY.—Now, we have looked into this distortion you saw on August 8, and you tell us you noticed several things. Will you tell us the others?

Mr. HALEY.—On August 28 I noticed several things.

Prof. KERRY.—You did not take particular notice of any other defects between August 8 and August 28?

Mr. HALEY.—No, sir.

Prof. KERRY.—No new ones developed?

Mr. HALEY.—No, sir.

Prof. KERRY.—What did you see on the 28th?

Mr. HALEY.—I saw this point as I described to you before, and I went right below it—this splice between chord 10 and chord 9. I saw the joints at panel point 9 and panel point 10 on the Quebec side of the cantilever arm, being the splice at the other end of chord 9 already referred to.

Prof. KERRY.—What condition were these joints in?

Mr. HALEY.—I stood up at the splice near panel point No. 9, and looking down at No. 10 you could see the bulge on both outside and inside.

Mr. HALEY.—On August 27, at 5.45 p.m., I went down to the joint near panel point 9 on the Quebec side of the cantilever arm and looked towards the main pier.

Prof. KERRY.—Now, go ahead and tell us what you saw.

Mr. HALEY.—I saw those bulges in this chord.

Mr. HOLGATE.—You saw bulges in the lower chord in panel 9, somewhere in panel 9 near panel 10.

Mr. HALEY.—Near the splice.

Prof. GALBRAITH.—About how long is that bulge?

Mr. HALEY.—That bulge there means about three feet and this one about two feet.

Mr. HOLGATE.—I have indicated the location of these bulges on the sketch marked '27—A.'

Prof. KERRY.—Will you mark the extent of that bulge out of line?

Mr. HALEY.—I stepped up here and took a look and it looked to me about an inch and a half.

Prof. GALBRAITH.—You had better put in the word 'apparently' because you did not measure it.

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—Where does it begin?

Mr. HALEY.—Just outside the splice.

Prof. KERRY.—It commenced just about the end of the spliced plate?

Mr. HALEY.—Yes.

Prof. KERRY.—I notice on the sketch, Mr. Haley, that only two of the ribs were bent, is that correct?

Mr. HALEY.—I just looked from the bed, I did not examine the centre ones.

Prof. KERRY.—You were standing on the lower chord at the time?

Mr. HALEY.—Yes, just over point 9.

Prof. KERRY.—Continue?

Mr. HALEY.—That is all I saw. On this chord directly opposite point 9 on the north side the same thing was visible.

Prof. GALBRAITH.—Panel 9?

Mr. HALEY.—Panel 9, yes, between points 8 and 9.

Prof. GALBRAITH.—You say that on the other side of the bridge directly opposite the panel point already spoken of, a similar thing was observed?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—Where were you standing when you observed this?

Mr. HALEY.—I walked up across the ladders over there and stood on top and it was very visible and I did not make any further examination.

Prof. KERRY.—You stood at panel point 9 on the Montreal side?

Mr. HALEY.—Yes, sir.

Prof. KERRY.—And were the bulges in the same direction?

Mr. HALEY.—The bulges I saw were just on the two outside, the same as this. I did not look on the inside. This splice was not riveted.

Prof. KERRY.—The splice on the Montreal side was not riveted?

Mr. HALEY.—The splice on the Montreal side was not riveted.

Prof. KERRY.—The plates were in place for riveting?

Mr. HALEY.—The plates were the way they had been left from the time it had been put up, the riveters had just got there and had not started in yet, just swung their scaffold.

Prof. KERRY.—Was there any displacement visible at this joint, were the webs out of line, or anything as in the other case?

Mr. HALEY.—Oh, yes, in connection with the webs, I did not look at these.

Prof KERRY.—The witness saw no displacement at the splice, he did not look for it.

Mr. HALEY.—But I saw the bulge, that was visible from the top in each side.

Prof GALBRAITH.—Outwards in both cases from the centre line of the chord?

Mr. HALEY.—Yes, sir.

Prof. KERRY.—On the 28th were all the spliced plates at panel point 9 on the Quebec side in place?

Mr. HALEY.—Yes, sir.

Prof. KERRY.—Splice and cover plates?

Mr. HALEY.—The cover plate on the bottom side, I do not know if it was there; I expect it was there, there was no scaffold under it and I did not get under it to look; I am not positive.

Prof. GALBRAITH.—You mean then that all the splice plates, the side plates and also the top cover plates were there, you do not know about the bottom cover plate?

Mr. HALEY.—No.

Prof. KERRY.—This is from outside observation without special examination?

Mr. HALEY.—Yes, sir.

Prof. KERRY.—You just looked at it, you did not go into it to see?

Mr. HALEY.—Only I put a mark on it, that is all.

Mr. HOLGATE.—On your visit of the 28th, is not your recollection clear with regard to the bottom plate being fastened to the chords?

Mr. HALEY.—On the 28th I had no way of seeing the bottom at all.

Mr. HOLGATE.—Now on your examination of the 6th it was absent?

Mr. HALEY.—There was a scaffold there then, and it lay right on the scaffold?

Mr. HOLGATE.—And its absence and the presence of the scaffold there enabled you to make this very close observation?

Mr. HALEY.—Yes, sir.

Prof. HOLGATE.—The absence of that plate was rather a notable thing, was it not?

Mr. HALEY.—It was indeed, yes.

Mr. HOLGATE. Then on your second visit, is it not reasonable to think that your attention would be called almost first of all to the bottom plate?

Mr. HALEY.—No, no.

Mr. HOLGATE.—For this reason, I mean, I am only mentioning what is in my mind; its absence enabled you to make these observations before.

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—Now, then, you must know whether that plate was on at the time of your second examination, or whether it was not on?

Mr. HALEY.—Oh, no, not necessarily. I told you I stepped on the top of the chord.

Mr. HOLGATE.—The scaffold was gone and the plate not lying there.

Mr. HALEY.—Understand that the plate is four feet in depth and there is no way

of getting under unless you get a line and get under there, and I did not make that examination. It was enough for me. I said: I will put a mark on that, and if it is any worse to-morrow, I am gone from here.

Mr. HOLGATE.—A mark on what?

Mr. HALEY.—I looked all along the line of rivets, and the first rivet out beyond the rest I put a chalk mark on it; at least Mr. Cook did, and the second rivet was just half way out. That is, the plate had bulged so it was just half way.

Prof. GALBRAITH.—Which plate?

Mr. HALEY.—The outside one of the chord, and he drew a line half way across and I said: To-morrow night I am going to have a look at that and if that is gone any further we will be able to tell by looking at these rivets.

Mr. STUART.—That is the Montreal side?

Mr. HALEY.—That is the Quebec side.

Mr. HOLGATE.—Was it impossible for you to have seen whether or not the plate was on on the 28th?

Mr. HALEY.—Quite so.

Mr. HOLGATE.—You could not have seen whether that plate was in or not?

Mr. HALEY.—Well, I could have, I suppose, if I had gone to some trouble.

Mr. HOLGATE.—But you did not.

Mr. HALEY.—I did not, no.

Mr. HOLGATE.—Do you know in any other way, whether that plate was or was not on?

Mr. HALEY.—No, sir.

Mr. HOLGATE.—You have already said that if the top plate were in position that the holes would draw the chord sections together at the top?

Mr. HALEY.—Yes, sir,

Mr. HOLGATE.—Now, if the bottom plate had been placed on and bolted or riveted, would the remaining portion of the chord be brought into its proper position?

Mr. HALEY.—It would if it met the hole, but if they reamed away about three-quarters of an inch it would not.

Mr. HOLGATE.—Then all the holes would have to be reamed so as to fit the position correctly?

Mr. HALEY.—Yes, sir,

Mr. HOLGATE.—Do you know whether that was done or not?

Mr. HALEY.—I am not prepared to swear whether that was reamed or not.

Mr. HOLGATE.—Did you hear anything about it?

Mr. HALEY.—I know the reamers were working all the time around there.

Mr. HOLGATE.—Then the plate must have been on?

Mr. HALEY.—I could not tell you whether the plate was on or not, the bottom plate on the 28th.

Mr. HOLGATE.—If the reamers were working on it——

Mr. HALEY.—Because my attention was called so forcibly to this.

Mr. HOLGATE.—If you believed the reamers were working on it, you must have believed the plate was on?

Mr. HALEY.—I thoroughly believe the plate was on, because the point was all riveted up.

Prof. KERRY.—You mean there was a force of riveters working on the bridge, but not at this particular point?

Mr. HALEY.—Not at this particular point. I never saw anyone working with a reamer at this point, but I know there were reamers working at different points where they were needed.

Mr. HOLGATE.—You cannot say who put that plate on?

Mr. HALEY.—No, sir, I cannot tell you only what I know.

Prof. GALBRAITH.—Referring now to the corresponding panel point on the other side of the bridge, you saw that when?

Mr. HALEY.—On August 28.

Prof. GALBRAITH.—At what hour?

Mr. HALEY.—At a quarter of six, the same hour.

Prof. GALBRAITH.—Who were with you?

Mr. HALEY.—Mr. George Cook, Tom Callihan and Harry Briggs.

Prof. GALBRAITH.—Did you visit that after you had completed your observation of the joint you have spoken of?

Mr. HALEY.—Yes, sir, right after.

Prof. GALBRAITH.—Right after?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—How many splices or cover plates were attached to the chord at that time?

Mr. HALEY.—I simply looked at the two outside plates of the chords, and they were both attached, but they were not full of bolts.

Prof. GALBRAITH.—Was the top cover plate in position?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—Was it riveted?

Mr. HALEY.—No, sir.

Prof. GALBRAITH.—It was bolted?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—Did you see the bottom cover plate?

Mr. HALEY.—No.

Prof. GALBRAITH.—Not even from the side of the bridge first examined?

Mr. HALEY.—No, sir.

Prof. GALBRAITH.—Where were you standing when you made the examination of this joint?

Mr. HALEY.—On the top of the bottom chord.

Prof. GALBRAITH.—Was there anything to interfere with your view in looking across to the corresponding joint on the other side of the bridge? In other words, could you see underneath in any degree or did you try?

Mr. HALEY.—I did not try.

Mr. HOLGATE.—Where you saw the bulge in the two outside ribs of the lower chord in panel 9 in the Quebec side of the bridge, did you notice the effect that that bulging might have had on the lacing?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—You might describe what you saw?

Mr. HALEY.—I have already described that. In some places it was down, and in other places it was bent up.

Mr. HOLGATE.—Was the bulge, as you have shown it on sketch 27-A, exactly in the two outside ribs?

Mr. HALEY.—Well as I could come to it.

Mr. HOLGATE.—The bulge was in the opposite direction in the two ribs?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—So that the space between the centres of those two ribs would be the original distance apart, plus the total bulge on each side.

Mr. HALEY.—Yes.

Mr. HOLGATE.—Then were the lacing angles still attached to the chord?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—Were any of the connections broken?

Mr. HALEY.—No, sir.

Mr. HOLGATE.—Now, you have said that some of the lacing angles were bent up and some down. How do you describe that?

The witness described the lacing by means of the plan.

Mr. HOLGATE.—From what you have described here it would appear that the only tendency would be to pull on these bars. I do not understand how any of them

could have been bent up; I speak now of the lacing angles. How do you account for any of them being bent up.

Mr. HALEY.—I will tell you, it is very simple to me. I did not describe any below here at all (indicating). I spoke of compression and when it shoves together, these things have naturally got to go some way or other.

Mr. HOLGATE.—Which, the lacing angles?

Mr. HALEY.—The lacing angles, yes.

Mr. HOLGATE.—Let us first of all confine ourselves to the bulge. Was there any change observable in the lacing bars at the bulge?

Mr. HALEY.—None that I could notice, but just behind the bulge.

Mr. HOLGATE.—Was there any observable distortion or bulge where you did notice the change in the shape of the angle lacing?

Mr. HALEY.—There was down in the centre of the chord. That is, I mean the centre of the outside web, the top and bottom edges of the outside web were separated by a very heavy angle, and this did not show so much as it did down in the centre; this bulge is down along in the centre.

Prof. GALBRAITH.—You are speaking now just of the outside rib?

Mr. HALEY.—Yes.

Prof. GALBRAITH.—And there are angles on both top and bottom of the outside rib?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—You put your eye along the outside line of these angles, did you?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—This is the joint between 10 and 9 on Exhibit 27-A?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—The bulge outwards on each side you said was 1½ inches apparently out of line?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE suggested an adjournment in order that a sketch might be made by Mr. McLure for the use of the Commissioners in examining Mr. Haley, in order to avoid confusion in his evidence between the two sketches which had been used in his examination.

The Commission took recess.

AFTERNOON SESSION—FIFTH DAY.

EDWARD A. HOARE, Chief Engineer, Quebec Bridge Company, recalled.

Mr. HOLGATE.—Mr. Hoare, we asked you for some further papers to be put in?

Mr. HOARE.—One was in answer to that question, as to the number of times I visited the bridge during erection. I have written out my answer, thought over it and written it out. It was an incomplete answer. (Reading):

In answer to question as to number of times I visited the bridge during erection, I find that I have not noted each trip, as at times when work was active my trips were often daily. I can also positively state that with the exception of the time required for visits to Phœnix Bridge Company's works at Phœnixville, and for other official purposes, connected with the Bridge Company's business, my visits were at least three times a week. Having telephone communication from the Quebec office and my residence it was my daily custom, with few exceptions, to call the bridge office to know what kind of work was in progress or going to be done that day, and if it was preparation work or moving the traveller, I generally remained in the office.

I can also positively state that since the commencement of any kind of work for the Quebec Bridge Company I have never taken any vacation and have always