

SESSIONAL PAPER No. 154

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 $1\frac{1}{2}$ 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 Phoenix Bridge Company's works at Phoenixville, 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

7-8 EDWARD VII., A. 1908

been within call and never off duty more than forty-eight hours at a time and then only once or twice a year.

You also asked me to file my professional record, to be more exact than the general information I gave you. This will take the place of my incomplete evidence; it is supplementary to my former evidence. I could not remember dates, I had to refer to some back records to get that statement. I submit this document:

PROFESSIONAL RECORD OF E. A. HOARE.

1866 to 1868 inclusive, in engineer's office, London, England, and on marine works connected with same.

1869 to end 1870, assistant engineer on Toronto, Grey and Bruce Railway.

1870 to 1872, resident engineer Great Northern Railway construction of Glencoe and Fort Erie loop line.

1873, after completion of loop line, appointed resident engineer on Wellington, Grey and Bruce branch lines between main line Great Western Railway and Lake Huron.

1873 to end of 1883. Appointed resident engineer by North Shore Railway Company on line between Quebec and Montreal, afterwards assistant chief engineer under commissioners appointed by provincial government of Quebec, to take over and complete the North Shore Railway between Quebec, Montreal and Ottawa, now a part of the Canadian Pacific Railway system.

1884 to 1889. Chief engineer and superintendent for H. I. Beemer, contractor on railway construction, terminals, work shops and water works.

From July 1889 to autumn of 1900. Chief engineer, Quebec and Lake St. John Railway and for about half that period at the same time chief engineer of Great Northern Railway between Rivière a Pierre Junction on Quebec and Lake St. John Railway and Hawkesbury, Ontario, the latter railway being controlled by the Quebec and Lake St. John Railway Company.

From last date to present time chief engineer Quebec Bridge and Railway Company.

Exclusive of the Quebec Bridge and Railway Company's works, the other work included about 27,000 feet of bridging, the majority being of steel on masonry piers and many deep water foundations.

Mr. HOLGATE.—Then there were certain reports of inspectors?

Mr. HOARE.—Yes, I would like to put on evidence a package of inspectors' reports that were sent to me by Mr. Edwards from Phoenixville, the chief inspector at Phoenixville.

(Three packages of papers produced, filed and marked as Exhibit No. 28.)

Mr. HOLGATE.—Then, Mr. Hoare, we want the diary of works.

Mr. HOARE.—The book I was showing you this morning, do you want that put on file?

Mr. HOLGATE.—I think we had better have that, yes. That dairy is what?

Mr. HOARE.—It is simply a daily record of erection. I might want to refer to that from time to time, could I get it?

Mr. HOLGATE.—Oh, it will always be available.

Mr. HOARE.—I have not a copy of it.

Mr. HOLGATE.—That was kept by—

Mr. HOARE.—It is the Quebec office record, I used to keep it in the office at Quebec.

Mr. HOLGATE.—And by whom was it written?

Mr. HOARE.—Mr. McLure used to write it up for me.

Mr. HOLGATE.—So that the diary is Mr. McLure's diary?

Mr. HOARE.—Taken from his field notes so that I could refer to anything we were discussing. I could turn that diary up in the office in Quebec and we could under-

SESSIONAL PAPER No. 154

stand each other. We used to talk a good deal over the 'phone about these matters. I had one record in the office and he had his field record and in discussing any particular matter we had identically the same records. That is a list of the tests which I will deposit (producing document). They are as follows :—

Reports of:—

1. Full sized eye-bar tests.
2. Material tested at Phoenixville.
3. Material tested at Carnegie's mill.
4. Physical and chemical tests, Carnegie's mill.
5. Reports on condition of work at shops.
6. Physical and chemical tests at Central works, Harrisburg.
7. Physical and chemical tests at Central works, Harrisburg.
8. Physical and chemical tests at Phoenixville.

The witness retired.

D. B. HALEY re-called.

Prof. GALBRAITH.—You recognize that sketch as No. 9 chord and this as No. 8 chord?

Mr. HALEY.—This is the pier this way, is it?

Prof. GALBRAITH.—Now with reference to the bulging of the lattice bars which you spoke of this morning, will you kindly point it out on that diagram? (Diagram filed and marked as Exhibit 27-B.)

Prof. GALBRAITH.—Now be very careful, this is the next.

The witness pointed to spots on the diagram which were marked by Prof. Galbraith.

Prof. GALBRAITH.—Those are the only three places you noticed a bulge? A, B and C. You noticed the bulges in the parts of the lacing marked by A, B and C on 27B?

Mr. HALEY.—These I paid particular attention to. There were other bulges there, but not so big as these.

Prof. GALBRAITH.—Did you observe any other bulging of the lacing? For instance, did you see anything on the bottom side of the chord?

Mr. HALEY.—No, I did not notice anything there; I did not look.

Prof. GALBRAITH.—Did you make any measurements of this bulging?

Mr. HALEY.—No, sir.

Prof. GALBRAITH.—Was the lacing curved horizontally, sideways, as well as up and down, either or both?

Mr. HALEY.—In some cases both and in some cases it was just sideways and not up at all.

Prof. GALBRAITH.—Each of these points was bulged down?

Mr. HALEY.—I could not tell you that.

Prof. GALBRAITH.—Which was bulged up?

Mr. HALEY.—It would take a very close inspection to remember all those little things. I distinctly saw that they were kinked and bulged out of shape.

Prof. GALBRAITH.—But you cannot specify each particular portion where any special bulging took place?

Mr. HALEY.—No, sir.

Prof. GALBRAITH.—Where were the bulges that you testified to this morning of the chord ribs in relation to this? Would you kindly mark them on the drawing? (Referring to Exhibit No. 27B.)

Prof. KERRY.—You show the bulge on the 8th chord? Was the bulge on the 8th chord?

Mr. HALEY.—It was on both of them.

7-8 EDWARD VII., A. 1908

Prof. KERRY.—Where were you standing?

Mr. HALEY.—I was standing at the panel point between 8 and 9.

Prof. KERRY.—Then the bulge that you saw was on panel 8 or panel 9? Was it the first piece from the pier?

Mr. HALEY.—It was the second piece.

Prof. KERRY.—That is panel 9 then? The sketch you showed was of panel 8.

Prof. GALBRAITH.—Were you standing on chord 8 or 9?

Mr. HALEY.—On chord 8.

Prof. KERRY.—You were on the third panel from the pier?

Mr. HALEY.—Yes, sir.

Prof. KERRY.—And the failure was under your feet?

Mr. HALEY.—Just ahead of me, two or three feet ahead of me looking towards the pier.

Prof. GALBRAITH.—You have already said you could not particularize as to the bulges, that you could not state which was up and which was down. Were there any side bends in the lacing?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—Can you specify the side bends?

Mr. HALEY.—I could not point out definitely as to each one. I could see they were on a line.

Prof. GALBRAITH.—Did you notice whether there was any disturbance in the next panel of lacing behind you?

Mr. HALEY.—No, sir, I did not notice that.

Prof. GALBRAITH.—This was the only place where you noticed a disturbance in the lacing in chord 8?

Mr. HALEY.—In chord 8—yes, sir.

Prof. GALBRAITH.—Going past the post, looking along chord 9 to the centre pier, did you observe any disturbance in the lacing.

Mr. HALEY.—No, sir, I did not look at the lacing at all.

Prof. GALBRAITH.—Did you look at the ribs?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—Did you notice any disturbance in the ribs?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—Would you kindly mark on the plan (Exhibit No. 27B) what you saw?

Mr. HALEY.—(Witness marked on plan and added): I saw both outside ribs warped in and out in approximately the two southern lacing panels in chord 9 which I have indicated on Exhibit No. 27B.

Prof. GALBRAITH.—You are speaking in the common way, you can call it either south or east?

Mr. HALEY.—You can call it either south or east.

Prof. GALBRAITH.—But we will call it for this purpose the south side.

Mr. HALEY.—All right.

Prof. GALBRAITH.—Can you particularize the shapes of the bulges on these two panels of lacing?

Mr. HALEY.—No, sir. All I can say is that they were something like an S.

Prof. GALBRAITH.—I am speaking of the lacings?

Mr. HALEY.—I did not notice these lacings.

Prof. GALBRAITH.—Can you particularize the deformation, bending, warping, or whatever you may call it, of the two ribs?

Mr. HALEY.—It was about an inch deviation in each. I stood upon chord 8 near this piece.

Prof. GALBRAITH.—You do not remember the number of bends in the length you have shown here?

Mr. HALEY.—No.

SESSIONAL PAPER No. 164

Prof. GALBRAITH.—Would there be two bends?

Mr. HALEY.—Yes, two or three.

Prof. GALBRAITH.—We are now discussing the joint between 9 and 10 and you have stated what you know about the bands in the outside ribs of chord 9 at that joint?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—The splice marked X on Exhibit No. 27A is the splice marked in the same manner on Exhibit 27B?

Mr. HALEY.—Yes.

Prof. GALBRAITH.—Are the two bulges marked on Exhibit 27A in the neighbourhood of the said splice the same bulges marked on Exhibit No. 27B, in the corresponding place? Do they represent the same bulges?

Mr. HALEY.—Yes.

Prof. GALBRAITH marks the joint referred to on Exhibit No. 27 as Y and also the corresponding joint on Exhibit No. 27B and continues: You say that the joint marked Y on Exhibit Nos. 27 and 27B represent the same joint?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—On Exhibit 27B I see no reference to any bulging of the ribs. Did these ribs bulge?

Mr. HALEY.—Yes.

Prof. GALBRAITH.—How did they bulge?

Mr. HALEY.—They bulged out sideways.

Prof. GALBRAITH.—To what extent?

Mr. HALEY.—To the extent I have marked here.

Prof. GALBRAITH.—What is the length of the bulges?

Mr. HALEY.—I never measured.

Prof. GALBRAITH.—Estimate?

Mr. HALEY.—Two or three feet—a little bit longer on the Quebec side.

Prof. GALBRAITH.—That is on this side?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—About the deflection—the springing?

Mr. HALEY.—I should say two inches.

Prof. GALBRAITH.—Did you measure it?

Mr. HALEY.—No, sir.

Prof. GALBRAITH.—You estimate the springing to be about two inches on the Quebec side?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—How much was the deflection on the Montreal side?

Mr. HALEY.—About an inch.

Prof. GALBRAITH.—Now we refer to splice X. Can you give, approximately, the length of the bended portion on each side of the chord?

Mr. HALEY.—No, sir.

Prof. GALBRAITH.—Can you give an estimate of the bended portion on each side of the chord?

Mr. HALEY.—I think it was about an inch. I estimated it.

Prof. GALBRAITH.—Was the length of the bended portions of the ribs on this splice about the length of two panels of lacing?

Mr. HALEY.—Yes, sir, to the best of my judgment.

Prof. GALBRAITH.—And there were bends on each side, how deep?

Mr. HALEY.—About an inch.

Prof. GALBRAITH.—On both sides?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—More than one on each side?

Mr. HALEY.—Yes, two or three of them.

Prof. GALBRAITH.—Shall I put down two or three?

Mr. HALEY.—Well, it is not definite, you know.

Prof. GALBRAITH.—That diagram is now correct, is it?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—At what time did you observe the bent ribs at splice X on Exhibit 27 B?

Mr. HALEY.—August 28.

Prof. GALBRAITH.—At what time did you observe the corresponding appearances at splice Y on the same exhibit?

Mr. HALEY.—August 28.

Mr. HOLGATE.—In what condition did you find the corresponding points on the Montreal side of the bridge?

Mr. HALEY.—I just noticed one point on the Montreal side on No. 8 chord.

Mr. HOLGATE.—Was that corresponding in position to point Y on 27 B?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—Directly opposite to it?

Mr. HALEY.—Yes.

Mr. HOLGATE.—On the western chord?

Mr. HALEY.—On the Montreal side chord.

Mr. HOLGATE.—Did it differ in any particular from what you noticed at point Y?

Mr. HALEY.—It was just about the same, but not so much.

Mr. HOLGATE.—How did you get at it? Were you on the chord?

Mr. HALEY.—I simply walked across on the bottom laterals.

Mr. HOLGATE.—Would you find out from very close inspection on the spot where the trouble was?

Mr. HALEY.—Yes.

Mr. HOLGATE.—You may describe what that was as you found it?

Mr. HALEY.—It was very much the same as on this side.

Mr. HOLGATE.—It was very much the same as on the Quebec side?

Mr. HALEY.—Yes, I noticed some lacings were out of place and I could notice the side waving.

Mr. HOLGATE.—The side of the chord?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—One side or two sides?

Mr. HALEY.—Both sides.

Mr. HOLGATE.—Was there very much bulging there?

Mr. HALEY.—Bulging signifies one bulge in one place, but at this place it was waving just like a snake, two or three deviations from the straight line that it should be.

Mr. DAVIDSON.—In and out?

Mr. HALEY.—Yes.

Mr. HOLGATE.—Did you make any measurements of that?

Mr. HALEY.—No.

Mr. HOLGATE.—Did you notice any defect that the change of shape had upon the lacing?

Mr. HALEY.—I noticed that the lacing was out of place.

Mr. HOLGATE.—In what way?

Mr. HALEY.—Kicked sideways and bent.

Mr. HOLGATE.—Was that visible both on the top chord and bottom chord?

Mr. HALEY.—I did not notice on the bottom of the chord; just on the top of the chord.

Mr. HOLGATE.—Were the lacing angles bent?

Mr. HALEY.—Yes.

Mr. HOLGATE.—Were the angles that passed across at right angles to the chord distorted or broken in any way?

Mr. HALEY.—No, they were not broken, but they showed that they had too much strain.

Mr. HOLGATE.—How would they show that?

Mr. HALEY.—By being warped a little bit. I walked just across one on the

SESSIONAL PAPER No. 154

diagonals but I just noticed these cross ones. They were a little bit warped at the top of the perpendicular angles.

Mr. HOLGATE.—Were any ribs connecting them to the chords broken?

Mr. HALEY.—No, sir, I did not notice any.

Mr. HOLGATE.—Is there anything else there that you notice? Is it fully described?

Mr. HALEY.—I have pretty fully described all I saw.

Mr. HOLGATE.—I mean about that particular point?

Mr. HALEY.—It is pretty fully described. It was not full of bolts.

Mr. HOLGATE.—That splice was not.

Mr. HALEY.—Yes. It was about two-thirds full of bolts and some of them were $\frac{5}{8}$ bolts.

Mr. HOLGATE.—That is the joint on the Montreal side?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—Between 8 and 9?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—What proportion of it was bolted?

Mr. HALEY.—About two-thirds.

Mr. HOLGATE.—Was it riveted at all?

Mr. HALEY.—No, sir.

Mr. HOLGATE.—What proportion of these bolts would be $\frac{3}{4}$ and what proportion $\frac{5}{8}$?

Mr. HALEY.—I could not say—a very small proportion, but I noticed some.

Mr. HOLGATE.—How could you tell a $\frac{3}{4}$ from a $\frac{5}{8}$ bolt?

Mr. HALEY.—It is very easy for me; I have been in the business nine years.

Mr. HOLGATE.—After nine years of experience you might have an idea of the proportion one to the other?

Mr. HALEY.—If I had noticed it closely enough. I could just see the bolts there and I noticed that.

Mr. HOLGATE.—I suppose that to some extent $\frac{5}{8}$ bolts were necessary on that work?

Mr. HALEY.—I expect they were when you could not get holes for big bolts.

Mr. HOLGATE.—Could you say that there were more $\frac{5}{8}$ bolts there than were necessary at that point?

Mr. HALEY.—I am not prepared to say that. It did not look to me as if $\frac{5}{8}$ bolts should have been used there at all.

Prof. GALBRAITH.—Was there any side displacement at that splice and the ends of the adjoining chords?

Mr. HALEY.—I did not look at that closely.

Prof. KERRY.—When you were talking about that splice this morning, Mr. Haley, you said that the web was out of line about $\frac{5}{8}$ of an inch?

Mr. HALEY.—Yes, sir.

Prof. KERRY.—Did they bring these webs back into line with a jack before they riveted them?

Mr. HALEY.—I could not swear to that.

Prof. KERRY.—You do not know whether they jacked them back into line?

Mr. HALEY.—They evidently helped them some, because I could see on August 28 on the splices the cover plate was drawn in for rivets and there was a bend in it right at this splice.

Prof. KERRY.—The cover plate was not flat?

Mr. HALEY.—No, showing that the splice had never been pulled into shape. That was on the bottom and I got down there and inspected it closely.

Prof. KERRY.—Was it like a regular crimp or a long bend?

Mr. HALEY.—It was a bend that was put in there with an 8-pound maul.

Prof. GALBRAITH.—Are you speaking now of a joint on the Quebec side of the bridge or a joint on the Montreal side of the bridge?

Mr. HALEY.—A joint on the Quebec side of the bridge.

7-8 EDWARD VII., A. 1908

Mr. HOLGATE.—Were there any other points that you wanted to draw our attention to, Mr. Haley, that you observed?

Mr. HALEY.—Not about this steel work. I have explained about all I know about it.

Mr. STUART.—Before you leave that would you mind getting exactly who accompanied him on the occasion of each of these visits?

Mr. HOLGATE.—Who accompanied you on the occasion of each of these visits?

Mr. HALEY.—On August 8th there was Mr. Joe Ward and Mr. George Cook.

Prof. GALBRAITH.—Are they alive now?

Mr. HALEY.—No sir, and on August 28th there were Mr. George Cook, Mr. Tom Callahan and Mr. Harry Briggs.

Prof. GALBRAITH.—Are the last two alive?

Mr. HALEY.—All three dead.

Prof. KERRY.—You noticed no other defect on the bridge?

Mr. HALEY.—No, sir.

Prof. KERRY.—That is all the defective work you know of?

Mr. HALEY.—All the defective work on the bridge; yes, sir.

Mr. HOLGATE.—And you paid no other visit but these two to these points?

Mr. HALEY.—No, sir.

Prof. GALBRAITH.—Do you identify this drawing as representing the west or Montreal chord that is referred to in your previous evidence?

Mr. HALEY.—Yes, sir. (Drawing put in, filed and marked Exhibit No. 27C.)

Prof. KERRY.—I did not follow you this morning. You said that you made a mark on the chord on the 28th and you were going to go back to see it on the 29th.

Mr. HALEY.—Yes, sir.

Prof. KERRY.—Tell me again how that mark was made and what the mark was.

Mr. HALEY.—I sighted the rivets right along the chord and I had Mr. Cook go down with a piece of soapstone and mark the first rivet I noticed that was out of line sticking up higher than the rest in the row.

Prof. KERRY.—What was the row of rivets holding together?

Mr. HALEY.—The outside web on the Quebec side of chord No. 8.

Prof. KERRY.—That is the outside vertical web?

Mr. HALEY.—Yes, sir.

Prof. KERRY.—One side of the chord?

Mr. HALEY.—Yes.

Prof. KERRY.—And you sighted along one of these?

Mr. HALEY.—Yes, and—

Prof. KERRY.—And he marked the first one that was out of line.

Mr. HALEY.—Out of line.

Prof. KERRY.—And then?

Mr. HALEY.—He went a little ways further and marked another. He went far enough to get one that was half way out. One was out half way—half of the head higher than the rest of the rivets—and he made a mark around this rivet, and we figured on coming around again on Thursday night to investigate after quitting time to see if any of these rivets had been shoved any further out. I was afraid of it myself. That is the reason I marked it.

Prof. KERRY.—What was shoving out?

Mr. HALEY.—The sides of chord No. 8.

Prof. KERRY.—They were shoving out and the tops of these rivets were along the top of the chord?

Mr. HALEY.—The chord was bulged. That portion (exhibiting a diagram) represents the whole depth of the chord and this is the row of rivets. As I looked along that I came to the first rivet I noticed that was out of line and I had him mark it.

Prof. KERRY.—It is riveted on the side?

Mr. HALEY.—Yes, sir; and a little way farther he got a rivet that was half way up and he marked it all around the rivet.

SESSIONAL PAPER No. 154

Prof. KERRY.—I do not follow yet which line of rivets that was.

Mr. HALEY.—The second row of rivets; a little below the angle.

Prof. KERRY.—So that it was bent up or out?

Mr. HALEY.—Bent out. Part of it was straight and then you would come to a bend and as you looked along the row you would see this sticking out. I was looking along horizontally.

Prof. GALBRAITH.—Could you see the neck of the rivet under the head?

Mr. HALEY.—No, I mean that this sheet (demonstrating with sheet of paper) was projected out and that this rivet (indicating) showed up more than the rest.

Mr. HOLGATE.—You would be standing on the bottom lateral?

Mr. HALEY.—No, sir, on my knees on the top of the bottom chord looking over the edge.

Mr. HOLGATE.—When you got this information what use did you make of it?

Mr. HALEY.—This information?

Mr. HOLGATE.—Yes, about these matters?

Mr. HALEY.—Why I simply made the remark that if I noticed any more to-morrow night, I was going, I was going from the job.

Mr. HOLGATE.—What I meant is, did you consider it important enough to state it to your foreman?

Mr. HALEY.—Oh, yes, I told it to several of them.

Mr. HOLGATE.—I mean your own foreman?

Mr. HALEY.—Yes, I rode from work in a carriage with Tom Aderholdt, Worley, and Arthur Meredith.

Mr. HOLGATE.—Didn't you see Mr. Yenser between this time and the time of the accident?

Mr. HALEY.—No, sir, I saw him down on the deck under me the next day when I was working but I didn't see him to talk to.

Mr. HOLGATE.—You did not mention it to Mr. Yenser?

Mr. HALEY.—Oh, no, those people only laughed at me. Yenser was scared to death, anyhow.

Prof. KERRY.—Was that positive knowledge Mr. Haley or just hearsay?

Mr. HALEY.—What?

Prof. KERRY.—The statement that you made about Mr. Yenser?

Mr. HALEY.—It is positive, I do not suppose he was scared to death, it did not kill him.

Prof. KERRY.—What ground have you for making that statement?

Mr. HALEY.—I have these grounds. I slid down from the traveller on a line in the morning to go to the toilet which was down on the lower chord very close to this defective chord and I saw the red stringers, that is the temporary floor stringers used to get the load out all standing in front of the office and I noticed after a while again that they went back to the yard again and I heard the report that Mr. Yenser would not place them, that his life was in danger as much as anybody else's. I did not hear that myself, that is second hand.

Mr. HOLGATE.—Who told you that?

Mr. HALEY.—Mr. Brittain, over there.

Mr. HOLGATE.—But you see it would look to me this way: that whereas you might place great importance on these matters now, that at that time you might not have placed the same importance on these things that you observed, and the fact of your going out to work and the other men going out to work rather shows that you did not consider these things of as great importance then as you might now. I thought that would be probable, a natural way of looking at it.

Mr. HALEY.—Well it fooled us, we did not think it would go so quick, that is all.

Mr. HOLGATE.—Your own idea was that you did not think them so serious as to keep you from working on the bridge?

Mr. HALEY.—I thought them very serious, but I thought surely I would have a chance to look at them the next night.

Mr. HOLGATE.—You are a man of experience in bridge building I take it. Now in the methods used there with regard to erection was ordinary care used?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—And the appliances that were used—

Mr. HALEY.—Were very good.

Mr. HOLGATE.—Were they very good?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—When you consider the exceptional character of the work you consider them very good?

Mr. HALEY.—With one or two exceptions. One exception in particular where they landed the bottom chord section with a channel that had I think six bolts, and I was always afraid of that. Of course I was not under it, I was on top of everything. That is the only thing that I did not like.

Mr. HOLGATE.—Did you see any of these operations?

Mr. HALEY.—Oh, yes.

Mr. HOLGATE.—And were they carried out successfully?

Mr. HALEY.—Oh, yes, there was never anything happened from it.

Mr. HOLGATE.—And had you confidence in Mr. Yenser?

Mr. HALEY.—Well, while I hadn't known him very long—but Mr. Yenser did not have much to say there.

Mr. HOLGATE.—Still I understand that he was the foreman in charge of that work?

Mr. HALEY.—Yes, sir.

Mr. HOLGATE.—I mean as foreman in charge of the work, did you think that he understood his work?

Mr. HALEY.—Yes, he knew his business. It was very evident he did when he didn't want to move that traveller.

Mr. HOLGATE.—As you understand it, was Mr. Yenser in supreme charge of that work?

Mr. HALEY.—Well he was not in supreme charge of the work. He had charge of hiring men and discharging them, but otherwise he was dictated to by three or four around there. His principal part of the work as I could understand it was to keep the men busy and use them to the best advantage, in the best places, &c.

Mr. HOLGATE.—Who were these then that you say could dictate to Mr. Yenser?

Mr. HALEY.—Mr. Birks, Mr. McLure and Mr. Kinloch, they all had their say; so had Mr. Milliken.

Mr. HOLGATE.—But it all came down then, did it not, to this, that Mr. Yenser did the work?

Mr. HALEY.—Oh, yes, he was in charge of the men.

Mr. HOLGATE.—The actual carrying out of the work that was done was by Mr. Yenser?

Mr. HALEY.—Issuing the orders; yes, sir.

Prof. GALBRAITH.—In saying what you have said are you giving simply your impression of the official organization of the work or are you simply giving an opinion that has no reference to the organization but simply to what you saw and felt and knew and heard?

Mr. HALEY.—I am giving my opinion as a man who has been on the job every day and saw how things went one day with another.

Mr. HOLGATE.—Should we understand from what you say that there was conflict of authority?

Mr. HALEY.—No, I do not believe that.

Mr. HOLGATE.—Or was it all in the way of discussion between Yenser and Birks and McLure from time to time?

Mr. HALEY.—Yes, there were discussions from time to time.

Mr. HOLGATE.—Well, is that not what you might expect on a work like that, that they would discuss these matters together?

SESSIONAL PAPER No. 154

Mr. HALEY.—Yes, of course.

Mr. HOLGATE.—Well, then, there was nothing out of the ordinary!

Mr. HALEY.—You asked me if Mr. Yenser was not in full charge? Yes, I simply said that he was after these people had their say so. Well, now, that is what I mean.

Mr. HOLGATE.—With regard to these matters that you noticed and which you have fully described to us, did you mention them to Mr. Kinloch or to Mr. McLure?

Mr. HALEY.—About this splice?

Mr. HOLGATE.—Yes, any of this?

Mr. HALEY.—They know more about it than I did.

Mr. HOLGATE.—Did you mention it to them?

Mr. HALEY.—No, I did not see them from the first time I noticed the defect until it was wrecked, I never saw them.

Prof. KERRY.—Turning again to the question of Mr. Yenser, I did not understand your statement very clearly, Mr. Haley, and to illustrate it could you tell us from your own observation any instances in which Mr. Yenser did anything against his own judgment on the advice of the gentlemen you have been referring to?

Mr. HALEY.—Well he moved out this traveller against his own judgment the last time.

Prof. KERRY.—Now, do you know that, or is that just hearsay?

Mr. HALEY.—I know that.

Prof. KERRY.—On what evidence?

Mr. HALEY.—Well, I heard him talking to Birks.

Prof. KERRY.—You overheard the conversation?

Mr. HALEY.—Yes, sir, Mr. Birks that is killed.

Prof. KERRY.—Can you relate that conversation with any distinctness.

Mr. HALEY.—Yes, sir, I can relate it just as it happened.

Prof. KERRY.—Well, go ahead.

Mr. HALEY.—I heard him say: 'Why in hell don't they let me take down this traveller?'

Prof. GALBRAITH.—That was Mr. Yenser?

Mr. HALEY.—This big traveller and get that God damn load off of there before they put up more steel on the end of it.

Prof. GALBRAITH.—He said this to Mr. Birks?

Mr. HALEY.—Yes.

Prof. GALBRAITH.—Did others besides you hear him?

Mr. HALEY.—Well, Mr. Cook must have heard, we were right together, we were on top of the traveller and they were on the top chord, only a distance of about 15 or 20 feet.

Prof. KERRY.—Was that the whole of the conversation?

Mr. HALEY.—That is about all I heard, they were talking away, the wind was blowing quite hard.

Mr. KERRY.—You did not hear Mr. Birks' reply?

Mr. HALEY.—Mr. Birks replied, but I did not hear what he said.

Mr. HOLGATE.—Whom do you suppose Mr. Yenser referred to by 'they?'

Mr. HALEY.—Well, I expect he referred to the Phoenix Bridge Company and the Quebec Bridge Company, his overseers, whoever they might be.

Prof. GALBRAITH.—Which traveller are you speaking of?

Mr. HALEY.—The big traveller, the 600 ton traveller.

Prof. GALBRAITH.—When did they begin taking down the big traveller?

Mr. HALEY.—Well, I could not give you the exact date, but I should think it was a month ago, anyhow.

Prof. GALBRAITH.—And was the progress apparently unnecessarily slow?

Mr. HALEY.—Well, it was very slow, but they had a small force of men and bad weather; they were very short of men.

Prof. GALBRAITH.—Was there any reason for that that you know of?

Mr. HALEY.—Yes, indeed, there is lots of reasons for that.

Prof. GALBRAITH.—Would you kindly describe what you thought were the reasons?

Mr. HALEY.—The principal reason for being short of men was that when they would go to the United States and ship men up here, if the men got dissatisfied with their job and quit, they would deduct the transportation out of their wages, which the men regarded as a plain public steal, and, of course, when they went back to the United States—they had to stand for it here, or else fight out all the money they had in law—and when they went back to the States the consequence was they told their brothers. That is why they were short of men.

Prof. GALBRAITH.—When was that first apparent on the work that they were short of men?

Mr. HALEY.—All this summer.

Prof. GALBRAITH.—Were there any strikes on the work?

Mr. HALEY.—There was one.

Prof. GALBRAITH.—At what time?

Mr. HALEY.—August the 8th.

Prof. GALBRAITH.—How long did it last?

Mr. HALEY.—Three days.

Prof. GALBRAITH.—Did all the men go back who were on strike?

Mr. HALEY.—No, sir, some of them had the good sense to go away and save their lives.

Prof. GALBRAITH.—Did any go back?

Mr. HALEY.—Oh, yes, quite a number went back.

Prof. KERRY.—What was the cause of the strike?

Mr. HALEY.—This same argument I have been telling you about deducting this fare, and they had a signed up agreement to pay the men at the rate of 50 cents per hour for every hour worked, signed by Mr. Milliken, the superintendent.

Prof. KERRY.—The question of the safety of the structure did not come up in any connection there?

Mr. HALEY.—No.

Prof. KERRY.—Now, what time in the morning did you hear that conversation between Mr. Yenser and Mr. Birks?

Mr. HALEY.—When they were moving out the traveller.

Prof. KERRY.—That was Wednesday morning?

Mr. HALEY.—Yes, sir.

Prof. KERRY.—About what hour?

Mr. HALEY.—I guess about nine o'clock.

Prof. KERRY.—It would be the 28th of August about 9 in the morning?

Mr. HALEY.—Yes.

Prof. GALBRAITH.—You say when moving out the traveller; I understood from the previous evidence that they were taking down the traveller?

Mr. HALEY.—There are two travellers.

Prof. GALBRAITH.—You are now speaking of the small traveller?

Mr. HALEY.—Yes.

Prof. GALBRAITH.—Moving forward to the next span?

Mr. HALEY.—Yes, sir.

Prof. GALBRAITH.—And did you ever discuss with Mr. Birks the defects in the structure, Mr. Haley?

Mr. HALEY.—Yes, sir.

Prof. KERRY.—What time was this?

Mr. HALEY.—Just about 15 minutes before Mr. Yenser came along.

Prof. KERRY.—That is on the Wednesday morning?

Mr. HALEY.—Yes.

Prof. KERRY.—Could you relate what occurred?

Mr. HALEY.—He was talking to another man, Mr. Durand, a man who is dead now. He says, it is all foolishness those fellows talking that way, if Haley hadn't gone down to look at that nobody would be a bit alarmed.

SESSIONAL PAPER No. 154

Prof. KERRY.—Who said this, Birks ?

Mr. HALEY.—We were sitting above his head and heard it and listened to what he said, and I said, it is perfectly safe, isn't it, Birks? and he looked up and smiled and answered, why, certainly it is ; you fellows are getting alarmed prematurely ; there is nothing to cause any alarm. We told him we did not think so ; we did not agree with him.

Prof. KERRY.—That was the end of the discussion ?

Mr. HOLGATE.—In the conversation that you overheard between Mr. Yenser and Mr. Birks, you could not say just now who you think Mr. Yenser referred to by using the word 'they' ? What I want to get at is who were Mr. Yenser's overseers, who would give him orders ?

Mr. HALEY.—Well, in this case Mr. Milliken was not here and Mr. Hoare had been on the job and I think they were orders from him. Of course I do not know who gave him his orders.

Prof. GALBRAITH.—When had Mr. Hoare been on the job ?

Mr. HALEY.—Mr. Hoare had been on the job I understood, he was on the job on Tuesday. I never saw him on the job, but there was a great deal of talk among the men.

Prof. KERRY.—Talk to what effect, Mr. Haley ?

Mr. HALEY.—About the bridge being unsafe and the fact that they sent those stringers back to the yard made a good deal of talk. Mr. Yenser refused to put them in place, saying his life was in danger as well as others.

Prof. KERRY.—Did you hear him say that ?

Mr. HALEY.—No.

Prof. KERRY.—Did you ever hear him say anything of that nature ?

Mr. HALEY.—No.

Mr. HOLGATE.—The whole object of this inquiry is to get as much real information as we can get.

Mr. HALEY.—All I have told you is true and I have not told anything I do not know.

Mr. HOLGATE.—Quite so. Is there anything else that you know in connection with the matter ?

Mr. HALEY.—No, I cannot say there is anything else I can tell you.

Prof. KERRY.—We want to get at information little or big, Mr. Haley, we want to get everything that was observed about the bridge. It might be that some things would be observed that would not be considered to have any bearing on the question, and yet on investigation may prove to have had something to do with it.

Mr. HALEY.—I could not give any light on anything like that, because I did not notice any.

Mr. HOLGATE.—From your intercourse with the various men on the work, whom do you know who can give us any information outside of the names that you have mentioned ?

Mr. HALEY.—I know Mr. Splicer can. I see you have J. J. Nance. Those who knew the most about it are killed. Mr. Britton and Mr. McCumber there—that is about all I recollect just now.

Mr. HOLGATE.—Are you aware of any discussions having taken place with regard to the delay in moving forward the little traveller? Were you present at this conversation ?

Mr. HALEY.—No, I have already stated all the conversations I have heard, but as to being aware, I was well aware it was a well known fact among the men.

Mr. HOLGATE.—You have the same general knowledge as the other men in connection with that matter.

Mr. HALEY.—I had a little more knowledge than some of them, that is, not the discussions, but I had a little more knowledge of what the discussions were about on account of inspecting this the night before ; some had not gone to that trouble.

Mr. HOLGATE.—What discussions ?

Mr. HALEY.—Just what I stated about Mr. Birks and Mr. Yenser. My position was up there, I wasn't around the part where the discussions were, the office.

Mr. HOLGATE.—Is that the only discussion you know of ?

Mr. HALEY.—Yes, sir, presently.

Mr. HOLGATE.—You do not know of any other discussions ?

Mr. HALEY.—I did not hear any. The discussions we had going home in the carriage with these other foremen and that I suppose does not count ; that is not on the subject.

Witness discharged.

DOMINIQUE McCUMBER sworn.

Prof. KERRY.—What was your job on the bridge ?

Mr. McCUMBER.—Erecting.

Prof. KERRY.—Were you working the day of the accident ?

Mr. McCUMBER.—Yes, sir.

Prof. KERRY.—What part ?

Mr. McCUMBER.—I worked till two o'clock in the afternoon.

Prof. KERRY.—You quit at two o'clock ?

Mr. McCUMBER.—Yes.

Prof. KERRY.—You did not see the accident ?

Mr. McCUMBER.—No.

Prof. KERRY.—Had you been over the bridge pretty much ?

Mr. McCUMBER.—Yes, every day I worked I was over there.

Prof. KERRY.—Did you see any parts of it that were in bad shape ?

Mr. McCUMBER.—Yes, one part.

Prof. KERRY.—Which was that ?

Mr. McCUMBER.—That is the sixth joint from the pier.

Prof. KERRY.—That is on the overhang ?

Mr. McCUMBER.—That is on the anchor arm, yes.

Prof. KERRY.—The sixth joint from which pier ?

Mr. McCUMBER.—From the main pier.

Prof. KERRY.—From the main pier ?

Mr. McCUMBER.—Yes.

Prof. KERRY.—What was the trouble with it ?

Mr. McCUMBER.—Well, of course, I did not know but those fellows that worked there told me that the joint was giving out, that is, a fellow by the name of Joe Mitchell, an Indian, who is dead, he is the one who told me. I looked around where the joint was and I could not see it. I did not pay much attention to it until they sent me down there to work reaming out some holes in the side webs.

Prof. KERRY.—That was which day ?

Mr. McCUMBER.—Tuesday, Tuesday morning.

Prof. KERRY.—To ream out some holes ?

Mr. McCUMBER.—Inside holes, inside the web ; yes.

Prof. KERRY.—Was that on the part that ran out over the water or the part running back on to the shore ?

Mr. McCUMBER.—Over the water.

Prof. KERRY.—The part running back over the water, the sixth joint on the pier ?

Mr. McCUMBER.—Yes, on the down stream side.

Prof. KERRY.—On the Quebec side ; you were reaming out some holes in the inside web ?

Mr. McCUMBER.—Yes, in the bottom chord.

Prof. GALBRAITH.—That is on the cantilever arm, the sixth point joint out ?

Mr. McCUMBER.—Yes, sir.

SESSIONAL PAPER No. 154

Prof. GALBRAITH.—Watch me count on the chart, centre post, 1, 2, 3, 4, 5, 6 ; is that the place ?

Mr. McCUMBER.—That is the place.

Prof. GALBRAITH.—Which side of the pin is the joint there ?

Mr. McCUMBER.—On the north side, on the river side, towards the traveller.

Prof. KERRY.—You were right by the floor beam, by the closet ?

Mr. McCUMBER.—Right by the floor beam, yes.

Prof. KERRY.—What did you see that was wrong ?

Mr. McCUMBER.—Well, the jacks was in there, they had some jacks in there, and I asked Tommy, Tommy was with me, I asked him what the jacks was in for ; he said the inside webs was turning.

Prof. KERRY.—And the jacks were put in to——

Mr. McCUMBER.—The jacks was in there, I do not know what they were put in for, but that is what he told me.

Prof. KERRY.—Put in there to push them back straight in ?

Mr. McCUMBER.—Yes.

Prof. KERRY.—Is that all you saw there ?

Mr. McCUMBER.—Yes, and the holes was supposed to be all inch holes and there was some $\frac{3}{4}$ bolts and $\frac{1}{2}$ to $\frac{3}{4}$ in that joint. The reason the riveters gave is that they said they had bad hose.

Prof. KERRY.—Was the joint bulged ; were all the bolts in ?

Mr. McCUMBER.—All the bolts were in, yes, except small bolts, $\frac{3}{4}$ bolts.

Prof. KERRY.—What made you quit at 2 o'clock ?

Mr. McCUMBER.—Well, I had a few words with the foreman and I quit.

Prof. KERRY.—You did not see any other bad points in the bridge ?

Mr. McCUMBER.—No, that is all I did see.

Prof. KERRY.—You did not see these other points that the men were talking about ?

Mr. McCUMBER.—No, I heard of them, but that is all. I paid no attention to look at that.

Prof. GALBRAITH.—Were all the splice plates in position ? I mean, were they all in position in the place where they ought to be, the side plates, the splice plates, you understand, were they all in the joint ?

Mr. McCUMBER.—Yes.

Prof. GALBRAITH.—Every one of them ?

Mr. McCUMBER.—All except the bottom plate.

Prof. GALBRAITH.—Where was the bottom plate lying ?

Mr. McCUMBER.—On the scaffold.

Prof. GALBRAITH.—How many plates were there, do you know, that were on ?

Mr. McCUMBER.—I do not know ; there was just that joint.

Prof. GALBRAITH.—I mean how many were there at that joint that were placed, that were ready to be bolted or riveted ?

Mr. McCUMBER.—How many ?

Prof. GALBRAITH.—Yes, how many plates ?

Mr. McCUMBER.—There was not any ready until we got the holes reamed.

Prof. GALBRAITH.—No, I do not mean that. I mean that were up there, put in position on the chord ; how many were on the chord, attached to it ? You say one was off ?

Mr. McCUMBER.—Yes, the bottom plate was off.

Prof. GALBRAITH.—How many were on ?

Mr. McCUMBER.—There was not any on the bottom side.

Prof. GALBRAITH.—No, but how many plates were on ?

Mr. McCUMBER.—On the side ?

Prof. GALBRAITH.—On the side plates, yes ?

Mr. McCUMBER.—Well there is on the outside and the inside too, on the outside the pillar and plate and on the inside there is the pillar and plate.

Prof. GALBRAITH.—On the outside there is a pillar and plate?

Mr. McCUMBER.—Yes.

Prof. GALBRAITH.—There were two plates and two pillars.

Mr. McCUMBER.—Yes.

Prof. GALBRAITH.—That is two plates?

Mr. McCUMBER.—Yes.

Prof. GALBRAITH.—Then, how about the inside pillars?

Mr. McCUMBER.—They were all on.

Prof. GALBRAITH.—And the top cover plate was on?

Mr. McCUMBER.—Oh yes, that was on.

Prof. GALBRAITH.—So that there was one off, lying on the scaffold?

Mr. McCUMBER.—Yes.

Prof. GALBRAITH.—The bottom cover plate?

Mr. McCUMBER.—Yes.

Prof. GALBRAITH.—Were there any rivets at all in those that were on?

Mr. McCUMBER.—Yes, the rest was all riveted except the joint, the inside and the outside and this bottom plate.

Prof. GALBRAITH.—The spliced plates were not riveted?

Mr. McCUMBER.—No, sir.

Prof. GALBRAITH.—Was the top cover plate riveted?

Mr. McCUMBER.—No, sir.

Prof. GALBRAITH.—How was it held?

Mr. McCUMBER.—The centre two rows were not riveted but the outside was.

Prof. GALBRAITH.—The two centre ribs were not riveted.

Mr. McCUMBER.—That is it.

Prof. GALBRAITH.—But the outside ribs, the spliced plates were riveted?

Mr. McCUMBER.—There are four holes in each plate; the outside were riveted, but these two centre rows were not.

Prof. KERRY.—Is there anything else you can think of that will help us to find out where the trouble was?

Mr. McCUMBER.—No, that is all I know.

Witness discharged.

Ed. BRITTON, sworn.

Mr. HOLGATE.—Are you an employee of the Phoenix Bridge Company?

Mr. BRITTON.—Yes, electrician?

Mr. HOLGATE.—You are an electrician?

Mr. BRITTON.—Yes, sir.

Mr. HOLGATE.—Where are you employed?

Mr. BRITTON.—All over the bridge, in all parts of the storage yards, and both sides of the river, and all around the Phoenix work at all.

Mr. HOLGATE.—On the 29th of August were you working?

Mr. BRITTON.—No, sir, I had left the 29th of August for Belair sub-station, the storage yard, that morning.

Mr. HOLGATE.—Then you were not near the bridge at the time of the accident?

Mr. BRITTON.—No, sir, I was not there.

Mr. HOLGATE.—What information by way of particulars connected with the structure have you got?

Mr. BRITTON.—The structure itself I have none, only from hearsay. I heard them talking and I mentioned to the boys on Wednesday morning they were going to move out the traveller. I told some of the boys about it, and they called me and I told of this private talk I heard.

Mr. HOLGATE.—What private talk?

Mr. BRITTON.—I heard them talking in the office, Yenser and Birks and McLure,

SESSIONAL PAPER No. 154

and that is the first time I heard of it, Tuesday morning the 27th, Yenser came out and told me they would not move the traveller; I am always there at the time they move the traveller, right behind the traveller, and when they told me they would not move I left the office. I heard them talking about the bottom chords being bad, and Yenser said he did not care to do it because his life was in danger.

Mr. HOLGATE.—What did he say about the bottom chord?

Mr. BRITTON.—He said there seemed to be a buckle, a start to buckle, or something like that.

Mr. HOLGATE.—You may have a general idea in your mind about what took place but I want to know what you heard?

Mr. BRITTON.—I heard him say about this chord.

Mr. HOLGATE.—What chord?

Mr. BRITTON.—The second and third chord, I think over the pier, on the down stream side, the Quebec side, the second and third chords from the pier.

Mr. HOLGATE.—You overheard a conversation bearing on this? You say that Mr. McLure was there at the time?

Mr. BRITTON.—Yes.

Mr. HOLGATE.—Mr. McLure would be able to tell us what actually took place?

Mr. BRITTON.—Yes, sir.

Mr. HOLGATE.—If you can give us the definite points that this conversation referred to it would be useful.

Mr. BRITTON.—I can show you, of course, what chords I heard them referring to.

Mr. HOLGATE.—How did they refer to them?

Mr. BRITTON.—The second and third chord on the Quebec side over the pier on the cantilever arm.

Mr. HOLGATE.—That is on the cantilever arm?

Mr. BRITTON.—Yes, of course I did not look at it, or anything like that, I only heard what they said.

Mr. HOLGATE.—Did you hear the whole conversation?

Mr. BRITTON.—Not all of it. I went out after I heard a certain amount of it.

Mr. HOLGATE.—You did not hear the conclusion of it?

Mr. BRITTON.—I heard Mr. Birks refer to Yenser about a chord being bent in the yard.

Prof. GALBRAITH.—Bent?

Mr. BRITTON.—Bent while in the storage yard.

Prof. GALBRAITH.—Lying bent in the storage yard that day?

Mr. BRITTON.—The way I understood it, yes, sir.

Prof. GALBRAITH.—He was not saying that one of the chords which had been placed in the bridge had been bent in the yard?

Mr. BRITTON.—He said there was one chord had been bent, probably it was that one.

Prof. GALBRAITH.—Is that what he said, then you misunderstood my previous question.

Mr. BRITTON.—That is what he said; he said it might have been this one they had in the storage yard that was bent. Then they went on to talk about it, and he told them he would go up on the chord, and if it did not look straight—

Mr. HOLGATE.—Are you recollecting this conversation as it took place?

Mr. BRITTON.—As it took place.

Mr. HOLGATE.—What was the upshot of this conversation?

Mr. BRITTON.—I cannot say what started it.

Mr. HOLGATE.—What was the end of it?

Mr. BRITTON.—Well, the last that I heard of it was that they were trying to tell Yenser that the chord might have been bent some before it was put in place. Yenser could not think that that would be possible because he said he had went over these chords different times. They went on talking and he said he did not care about moving

out the traveller again until they fully investigated. They kept on talking and I went outside. The next morning he told me they were not going to move the traveller, Wednesday morning. I went out on the traveller and told Cook and a couple of men asking them about it, if they heard it. I began to think it quite serious myself, after hearing them talk it over. I told these gentlemen and they seemed to go down that night and look at the chord I was alluding to.

Mr. HOLGATE.—This was what night?

Mr. BRITTON.—Wednesday night, it was Tuesday morning I heard the conversation.

Mr. HOLGATE.—Were you with them?

Mr. BRITTON.—No, sir, I did not go to see it at all.

Mr. HOLGATE.—How do you know they went down there?

Mr. BRITTON.—I just say they told me so—Mr. Haley—I could not say they went down for sure, only he told me. They told me they were going to go and look at it that day.

Mr. HOLGATE.—Of your own knowledge, have you information of or any knowledge of anything out of order?

Mr. BRITTON.—No, only what I heard them say.

Mr. HOLGATE.—And that arose first of all at this conversation you heard?

Mr. BRITTON.—Tuesday morning.

Mr. HOLGATE.—And you heard nothing before that?

Mr. BRITTON.—Nothing before that whatever.

Witness discharged.

THEODORE LACHAPELLE SWORN.

Mr. HOLGATE.—Are you in the employ of the Phoenix Bridge Company?

Mr. LACHAPELLE.—Yes.

Mr. HOLGATE.—In what capacity, what do you do?

Mr. LACHAPELLE.—I am a bridge worker, I do everything.

Mr. HOLGATE.—What are you, an erector?

Mr. LACHAPELLE.—Yes, an erector.

Mr. HOLGATE.—How long have you been there on this Quebec bridge?

Mr. LACHAPELLE.—Well, that is this summer I have been there for six or seven weeks; I worked there before.

Mr. HOLGATE.—Were you working on the 29th day of August?

Mr. LACHAPELLE.—The 29th day of August?

Mr. HOLGATE.—The day the accident happened to the bridge?

Mr. LACHAPELLE.—No, I worked there until nine o'clock in the morning and then came over here to Quebec.

Mr. HOLGATE.—Why did you leave?

Mr. LACHAPELLE.—Well, I left on account of wind and I did not feel like working that day and I left.

Mr. HOLGATE.—Was it on account of wind or—

Mr. LACHAPELLE.—I did not feel like working so I thought I would come over here.

Mr. HOLGATE.—So it was not on account of wind?

Mr. LACHAPELLE.—Oh, yes, I was working on the top traveller.

Mr. HOLGATE.—How fast was the wind going that day?

Mr. LACHAPELLE.—I did not run against it and see how fast it was going.

Mr. HOLGATE.—Was it faster than other days?

Mr. LACHAPELLE.—No, but a man feels like work one day and he does not another day.

Mr. HOLGATE.—Then you did not see the accident?

Mr. LACHAPELLE.—No, I was not there when the accident happened.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—Previously to the accident where were you working on the bridge?

Mr. LACHAPELLE.—Well, I was working on the big traveller.

Mr. HOLGATE.—And that was the last job you had?

Mr. LACHAPELLE.—Yes, taking down the big traveller.

Mr. HOLGATE.—Do you know from your own knowledge of anything defective or wrong existing in the structure?

Mr. LACHAPELLE.—No.

Mr. HOLGATE.—That you considered so?

Mr. LACHAPELLE.—Not that I know of. That bottom chord they talked about but I never went over to see, I never went over and looked at it, never anywheres near it. I worked on the bottom chord on this side between the two piers, but I did not work on the bottom chord on the outside pier.

Mr. HOLGATE.—Which bottom chord did you work on?

Mr. LACHAPELLE.—I worked on both of them, in the inside pier, between the two piers. Nothing I see was wrong and I worked around the pier, around the shoe there I worked there for about five or six days or more.

Mr. HOLGATE.—Could you say that as far as you saw the work was properly done?

Mr. LACHAPELLE.—Yes, as far as I could see, but of course you could not do it all in one day. If a little work was bad and you had some of them raising the iron and some others finishing up back of it fitting up and riveting and all that, the work was all right as far as I could find out, the part I seen.

Mr. HOLGATE.—And you traversed that bridge back and forward to the travellers several times a day?

Mr. LACHAPELLE.—Oh, yes, several times a day.

Mr. HOLGATE.—And of your own knowledge do I understand that you do not know of anything that was wrong?

Mr. LACHAPELLE.—No.

Mr. HOLGATE.—Have you worked about the shoe?

Mr. LACHAPELLE.—Yes.

Mr. HOLGATE.—What work were you doing there?

Mr. LACHAPELLE.—Well, I was reaming out holes and putting in bolts.

Mr. HOLGATE.—How long were you there?

Mr. LACHAPELLE.—Straightening up angles, where we had the chain around to raise up the iron and a flange would bend or anything, we would straighten that up to look better, that is all.

Mr. HOLGATE.—How long were you there?

Mr. LACHAPELLE.—About three or four days in that place.

Mr. HOLGATE.—Did you observe anything wrong at that particular place?

Mr. LACHAPELLE.—Not that I saw.

Mr. HOLGATE.—No broken plates or angles?

Mr. LACHAPELLE.—I saw no broken plates or angles. I saw some angles that were bent but we go to work and straighten them and get them back with a couple of mauls.

Mr. HOLGATE.—How long have you been a bridgeman?

Mr. LACHAPELLE.—For the last five years.

Mr. HOLGATE.—Constantly on bridge work?

Mr. LACHAPELLE.—Yes.

Mr. HOLGATE.—If you had been in that vicinity for three or four days is it probable that you would have seen if there was anything wrong there from your general observation?

Mr. LACHAPELLE.—I did not run around the shoe on purpose to look and see if anything was wrong. I was sent to a certain point at that time to clean up, cleaning out the holes and putting bolts in. Of course, I walked around there but I never took a special day to go and see if there was anything wrong. I never saw anything wrong there.

7-8 EDWARD VII., A. 1908

Mr. HOLGATE.—Have you heard it stated that there was a plate cracked there ?

Mr. LACHAPELLE.—I heard that there was a plate cracked there only after the bridge was down. I never heard it before.

Mr. HOLGATE.—Your opinion is, from your inspection, that probably someone has made a mistake about that ?

Mr. LACHAPELLE.—I don't know.

Prof. KERRY.—You saw that plate pretty often ?

Mr. LACHAPELLE.—Yes, I went over this plate pretty often. I was there when we put the shoe on two years ago and I was there last year and this year but I never saw any plate cracked there. I have been on this job three seasons and I never saw a plate cracked.

Mr. HOLGATE.—Are you quite clear about the plate I mean and to which I referred just now ?

Mr. LACHAPELLE.—No, I am not,—whether it was the plate around the shoe. I was around that shoe and I saw no plate cracked. If there was a plate cracked there I never saw it. It is probably another plate I have seen. There are a good many plates around there.

Mr. HOLGATE.—Were any of the plates shaped or crimped ?

Mr. LACHAPELLE.—No, there was a plate there that was cracked but it was made to be cracked.

Witness discharged.

Commission adjourned until 10 a.m. to-morrow (Saturday).

SIXTH DAY.

QUEBEC, Saturday, September 14, 1907.

The Commission resumed at 10 a.m.

Mr. PETER FRENCH, was sworn as interpreter.

DESIRE LEFEBVRE, sworn.

Mr. HOLGATE.—Are you employed by the Phenix Bridge Company ?

Mr. LEFEBVRE.—Yes, sir.

Mr. HOLGATE.—How long have you been with that company ?

Mr. LEFEBVRE.—About four years.

Mr. HOLGATE.—What portion of that time were you working on the Quebec bridge ?

Mr. LEFEBVRE.—I worked there during the whole four years every summer at the bridge.

Mr. HOLGATE.—What were your duties ?

Mr. LEFEBVRE.—I worked for one summer on the ground work with the bull gang, and for the last three summers I have been running the crane.

Mr. HOLGATE.—Where ?

Mr. LEFEBVRE.—In the storage yard.

Mr. HOLGATE.—Did your duties necessitate in any way your going on the bridge structure during its erection ?

Mr. LEFEBVRE.—No, sir.

Mr. HOLGATE.—In connection with your duties in the storage yard, what had you to do ?

Mr. LEFEBVRE.—In the storage yard I unloaded cars that came from the shop.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—What do you mean by the shop?

Mr. LEFEBVRE.—The iron sent from the shops from the Phoenix Bridge Company. I do not know where the shops were. I mean the iron sent from the shop of the Phoenix Bridge Company. I mean iron brought by train or out of the Phoenix Bridge Company's shops.

Mr. HOLGATE.—Were you foreman of the gang?

Mr. LEFEBVRE.—No.

Mr. HOLGATE.—What was the name of the foreman?

Mr. LEFEBVRE.—I do not know his first name. His name is Clark.

Mr. HOLGATE.—In handling all that material from the cars after it arrived from Phoenixville, could you say that it was all carefully handled?

Mr. LEFEBVRE.—I do not know much about it, but everything seemed correct.

Mr. HOLGATE.—Have you knowledge of any accident happening in the handling of that material in the storage yard?

Mr. LEFEBVRE.—No, if any accident happened I did not know it.

Mr. HOLGATE.—If any accident of that nature did happen who would be likely to know it?

Mr. LEFEBVRE.—I could not say. Mr. Clark would have information because he was the foreman there the whole time.

Mr. HOLGATE.—Have you heard from others that any accident of that nature did take place, like the breaking of a piece out of the tackle?

Mr. LEFEBVRE.—Yes, I did.

Mr. HOLGATE.—From whom did you hear that?

Mr. LEFEBVRE.—From Mr. Roberge.

Mr. STUART.—What is his Christian name?

Mr. LEFEBVRE.—Malcolm.

Mr. HOLGATE.—Were you ever on the bridge structure?

Mr. LEFEBVRE.—Yes, sir, I was there this spring on the track. I was there working about four days this spring.

Mr. HOLGATE.—Whereabouts on the bridge were you working?

Mr. LEFEBVRE.—On the end, in the middle and on the ground. I was not everywhere around on top but I was on the track.

Mr. HOLGATE.—Were you below the track?

Mr. LEFEBVRE.—No.

Mr. HOLGATE.—Were you there more than four days?

Mr. LEFEBVRE.—I worked on the beach the other part of the time outside of these four days. I worked for about eight days, four days on top and four days below the bridge.

Mr. HOLGATE.—During that time and any other time that you may have been on the bridge was anything particular drawn to your attention?

Mr. LEFEBVRE.—No.

Mr. HOLGATE.—Then you know nothing personally in regard to the structure?

Mr. LEFEBVRE.—I heard something.

Mr. HOLGATE.—Do you of your own knowledge.

Mr. LEFEBVRE.—No.

Mr. HOLGATE.—Have you any knowledge and what is the nature of it in regard to anything of a defective nature?

Mr. LEFEBVRE.—The only knowledge I have is what I have been told by people about it.

Mr. HOLGATE.—Who gave you that information?

Mr. LEFEBVRE.—I got it from an Indian who is dead.

Mr. HOLGATE.—From anybody else?

Mr. LEFEBVRE.—No.

Mr. HOLGATE.—What was the nature of the information you got?

Mr. LEFEBVRE.—I was told that there was a piece of iron that had been forced. That is the way the Indian told me.

Mr. HOLGATE.—What was the Indian's name?

Mr. LEFEBVRE.—Angus Blue. That is the name he went by; I am not sure that it is his right name.

Mr. HOLGATE.—He is one of those who lost his life?

Mr. LEFEBVRE.—Yes, sir, he got killed in the accident.

Mr. HOLGATE.—Was the information given you by him sufficient to enable you to understand exactly what was meant?

Mr. LEFEBVRE.—Yes.

Mr. HOLGATE.—Will you tell us exactly what he told you?

Mr. LEFEBVRE.—He told me that there was a large chord on the Quebec side which was strained.

Prof. GALBRAITH.—Does 'forced' mean that it was a little out of shape?

Mr. LEFEBVRE.—The Indian did not tell me exactly what he meant by the word.

Mr. HOLGATE.—Was it on the bridge he told you this?

Mr. LEFEBVRE.—No.

Mr. HOLGATE.—Did he mention it more than once?

Mr. LEFEBVRE.—No.

Mr. HOLGATE.—When was it that he told you this?

Mr. LEFEBVRE.—I cannot say precisely at what date, but about four weeks ago.

Mr. HOLGATE.—Anybody else mention this matter to you?

Mr. LEFEBVRE.—No.

Mr. HOLGATE.—Is that the only thing that you heard from any source?

Mr. LEFEBVRE.—Yes.

Mr. HOLGATE.—You said that it was a chord on the Quebec side. Was it an upper chord or a lower chord?

Mr. LEFEBVRE.—The lower chord.

Mr. HOLGATE.—Was it in the anchor arm or the cantilever arm?

Mr. LEFEBVRE.—He did not tell me.

Witness discharged.

E. L. EDWARDS sworn.

Mr. HOLGATE.—What is your official position?

Mr. EDWARDS.—Inspector of materials at mills and shops for the Quebec Bridge and Railway Company.

Mr. HOLGATE.—Are your duties entirely connected with the Quebec Bridge and Railway Company—confined to the inspection of work and material for the Quebec Bridge and Railway Company?

Mr. EDWARDS.—There was one occasion on which I did a little work while there was practically nothing being done for the Quebec bridge and Railway Company.

Mr. HOLGATE.—When were you appointed?

Mr. EDWARDS.—In May, 1904.

Mr. HOLGATE.—By whom were you appointed?

Mr. EDWARDS.—By Theodore Cooper with the consent of Mr. Hoare.

Mr. HOLGATE.—To whom were you responsible?

Mr. EDWARDS.—To both Mr. Cooper and Mr. Hoare.

Mr. HOLGATE.—From whom did you receive instructions?

Mr. EDWARDS.—From both.

Mr. HOLGATE.—By whom were you paid?

Mr. EDWARDS.—By the Quebec Bridge and Railway Company.

Mr. HOLGATE.—Have you written instructions relating to your appointment and defining your duties?

Mr. EDWARDS.—I have written instructions in regard to my appointment, but no written instructions in regard to my duties that I recollect now. They were given verbally.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—What is your understanding of your instructions?

Mr. EDWARDS.—My instructions were from Mr. Cooper, first that we should use unusual care, that this was a bridge of great magnitude and that we should do everything in our power to get the very best materials and workmanship, and the understanding was that if my services were not satisfactory they would be dispensed with.

Mr. HOLGATE.—Did Mr. Cooper or Mr. Hoare furnish you with a specification of the material and the workmanship required?

Mr. EDWARDS.—No, sir.

Mr. HOLGATE.—Then, what was the standard that you adopted in your inspection of the material and the workmanship?

Mr. EDWARDS.—The Quebec Bridge Company's specifications, Mr. Theodore Cooper's specifications of 1904, and also we made certain special tests outside of these that were not covered by any of these specifications.

Mr. HOLGATE.—Who furnished you with these specifications?

Mr. EDWARDS.—I secured them at the office of the Phoenix Bridge Company.

Mr. HOLGATE.—Were they approved by Mr. Cooper or Mr. Hoare?

Mr. EDWARDS.—No, sir.

Mr. HOLGATE.—Do we understand, Mr. Edwards, that the specifications that you worked under as to the standard of material and workmanship were those that you received from the Phoenix Bridge Company, the contractors only?

Mr. EDWARDS.—Also in case of doubt as to any material it was to be referred to Mr. Cooper's judgment, which I did on several occasions.

Mr. HOLGATE.—In those cases what course was followed?

Mr. EDWARDS.—Mr. Cooper told me how to proceed.

Mr. HOLGATE.—Did he prescribe special tests in those cases?

Mr. EDWARDS.—He did in some cases, but he told me that he would be guided by the circumstances in each case.

Mr. HOLGATE.—Were special tests made?

Mr. EDWARDS.—Special tests were made; yes, sir. Mr. Cooper incorporated some of them in an article written by Mr. Cooper and read before the American Society of Civil Engineers under the title of 'Some new facts about eye-bars.'

Mr. HOLGATE.—These special tests were made at your immediate instance?

Mr. EDWARDS.—At Mr. Cooper's instance.

Mr. HOLGATE.—Are these the tests you referred to just now as being made specially by the Phoenix Bridge Company?

Mr. EDWARDS.—There is additional information. These tests were made in part but there is also additional information which is not covered by my reports.

Mr. HOLGATE.—Where were these tests made?

Mr. EDWARDS.—Made at the works of the Phoenix Iron Company.

Mr. HOLGATE.—All of them?

Mr. EDWARDS.—Yes, sir.

Mr. HOLGATE.—These are the special tests? Were there any tests anywhere else of material?

Mr. EDWARDS.—Outside of the usual tests?

Mr. HOLGATE.—Yes.

Mr. EDWARDS.—No other tests were made that I recall.

Mr. HOLGATE.—Was all the testing done at the Phoenix Iron Company's works?

Mr. EDWARDS.—No, sir, the test of plates were made at the Central Iron and Steel Company, specimen tests of plates were made at the Carnegie Steel Company, and tests of sizes at the Bethlehem Steel Company.

Mr. HOLGATE.—Were you present at these tests?

Mr. EDWARDS.—No, at Harrisburg Mr. Keenan performed all these tests and the tests were performed on the Carnegie material by John N. Ostrom.

Mr. HOLGATE.—Was the result of these tests recorded?

Mr. EDWARDS.—The result of these tests was recorded.

Mr. HOLGATE.—Have you the records?

Mr. EDWARDS.—The records are here. They have been submitted.

Mr. HOLGATE.—Are they included in the reports that Mr. Hoare has put in in regard to the inspection?

Mr. EDWARDS.—Yes, sir.

Mr. HOLGATE.—You had a systematic form of reporting all tests and inspections?

Mr. EDWARDS.—Yes, sir, regular forms for reporting each class of test.

Mr. HOLGATE.—How often did you report?

Mr. EDWARDS.—I made a monthly report on the shop work and besides that about every month or two I would send in a batch of tests to Mr. Hoare covering the material which had been inspected in the meantime since the last report.

Mr. HOLGATE.—I think you said that you sent these reports also to Mr. Cooper?

Mr. EDWARDS.—The tests of full sized eye-bars were sent to both Mr. Cooper and Mr. Hoare and the specimen tests of material were sent to Mr. Hoare only. Mr. Cooper received these except in such cases as he asked for them. He asked for them on the eye-bars.

Mr. HOLGATE.—Was the inspection in regard to workmanship reported to Mr. Cooper and Mr. Hoare?

Mr. EDWARDS.—It was reported to Mr. Hoare in monthly reports and verbally to Mr. Cooper on the occasion of my visits to him. I saw him monthly.

Mr. HOLGATE.—There were no written reports to Mr. Cooper?

Mr. EDWARDS.—No, nothing of any account.

Mr. HOLGATE.—Was there anything of a very special nature that arose in regard to the material that was used?

Mr. EDWARDS.—Nothing of account—no, sir.

Mr. HOLGATE.—Who decided the form of the report, Mr. Edwards, that you sent in?

Mr. EDWARDS.—The form of the report was really gotten up by me, subject to Mr. Cooper, and I could not say whether he submitted it to Mr. Hoare or not, but I am inclined to think he did and it was returned to me with Mr. Cooper's approval.

Mr. HOLGATE.—Was the report form changed in any way during the progress of the work?

Mr. EDWARDS.—No, sir.

Mr. HOLGATE.—So then the reports will show a continuous uniform system of keeping records from the first starting of the work at the shop up to the present time?

Mr. EDWARDS.—Yes, sir.

Mr. HOLGATE.—In connection with the testing of materials, Mr. Edwards, what experience have you had?

Mr. EDWARDS.—I had, previous to my connection with this work, an experience of seventeen years.

Mr. HOLGATE.—You might just give us some details of that?

Mr. EDWARDS.—Well, for a year or a year and a half, I have forgotten the exact time, I was connected with the Pottsville Iron and Steel Company in their testing department and also in their mills in another capacity. After that, I went out with William R. Webster as inspector. I remained for two years there, after which I was connected with G. W. G. Ferris and Company for about the same time, with B. H. Garrett & Blair for four or five years and was manager for Robert W. Hunt & Co., in their Philadelphia district for six years.

Mr. HOLGATE.—Did that work embrace a quantity of material used in the construction of bridges?

Mr. EDWARDS.—For the most part bridges and building work.

Mr. HOLGATE.—Did that experience embrace the processes of manufacture of the material?

Mr. EDWARDS.—It did.

Mr. HOLGATE.—And of the testing of it?

Mr. EDWARDS.—Yes, sir.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—Did you represent in these cases the iron company or the purchasers ?

Mr. EDWARDS.—The purchasers with that one exception, that time I was with the Pottsville Iron and Steel Company.

Prof. GALBRAITH.—You have knowledge of the relation of the chemical analysis of the materials and products, and also of the later microscopical examination to the properties revealed in material.

Mr. EDWARDS.—I have a knowledge of the chemical properties; the microscopical we do not deal so much with.

Mr. HOLGATE.—In the course of your inspection of the material for this particular work, Mr. Edwards, what proportion, roughly speaking, were you obliged to reject ?

Mr. EDWARDS.—Very little.

Mr. HOLGATE.—I am speaking now only of the material ?

Mr. EDWARDS.—Of the material.

Mr. HOLGATE.—Not yet fabricated ?

Mr. EDWARDS.—Very little indeed, for the reason that the mills for the most part attempted to throw out the material before it came to us.

Mr. HOLGATE.—That is before they submitted the material to you for inspection, they made themselves reasonably sure that it would pass your inspection ?

Mr. EDWARDS.—Yes, sir, realizing the importance of the work. For instance the Central Iron and Steel Company showed me one time I was there, a huge pile of eye-bar material that they had rejected. I had not gone over it, it had never been submitted to our men at all. Anything they thought he would reject they did not put before him.

Mr. HOLGATE.—Well, what value do you place upon that action ?

Mr. EDWARDS.—Well, it simply saved them the labour of handling that material; they turned it into scrap before they handled it in their different departments.

Mr. HOLGATE.—Then of the material that was actually submitted to you for inspection, what percentage were you obliged to reject ?

Mr. EDWARDS.—Oh, I should say not over 2½ per cent of the material submitted was rejected.

Mr. HOLGATE.—Well, will the reports show the rejections ?

Mr. EDWARDS.—No, they will not; the reports will not show all the material rejected.

Mr. HOLGATE.—Do the reports note the rejection of material at all ?

Mr. EDWARDS.—Yes, sir.

Mr. HOLGATE.—Is there any information that you can give us with regard to material that is not contained in the reports ?

Mr. EDWARDS.—None whatever.

Mr. HOLGATE.—And the file of reports is complete ?

Mr. EDWARDS.—The reports are complete; yes, sir.

Prof. GALBRAITH.—You knew the exact nature of the material which was furnished to the shop; you know its history, where it was made and the process by which it was made and the necessary composition of the material ?

Mr. EDWARDS.—Yes, sir, we have complete records of all the material and by whom every piece was rolled.

Prof. GALBRAITH.—Did you ever examine in the rolling mill the cropping of the ingots ?

Mr. EDWARDS.—No, sir.

Mr. HOLGATE.—Now, with regard to the fabrication of the material, Mr. Edwards, have you a copy of the specifications you worked under ?

Mr. EDWARDS.—Have I that with me ?

Mr. HOLGATE.—Yes ?

Mr. EDWARDS.—No, sir, I have not.

Mr. HOLGATE.—You can furnish us with that?

Mr. EDWARDS.—Yes, sir.

Mr. HOLGATE.—Did you inspect the fabrication?

Mr. EDWARDS.—The fabrication was inspected, I had charge of that with Mr. Meeser as my assistant and Mr. McLure certain months of the year as assistant when he was not up here on erection.

Mr. HOLGATE.—Was that inspection a continuous one at the shop?

Mr. EDWARDS.—Yes, sir, it was.

Mr. HOLGATE.—And how was your inspection noted on the completed members? Was it marked on the completed members, is there a record on the member itself?

Mr. EDWARDS.—On the member itself there is a large 'Q' in yellow paint, and inside is stamped 'Q-B', showing that the material is accepted.

Prof. GALBRAITH.—That is, there were two 'Q's', a large 'Q' and inside a stamp 'Q-B.'

Mr. EDWARDS.—Yes.

Prof. GALBRAITH.—One painted on, the other stamped?

Mr. EDWARDS.—Yes, that is it. That was not done on the eye-bars, we never placed those stamps on there, they had enough marks on as it was.

Prof. GALBRAITH.—And how did you mark rejected members?

Mr. EDWARDS.—They were not marked at all.

Prof. GALBRAITH.—Were there any members rejected?

Mr. EDWARDS.—When I said they were not marked at all, I had reference to the piece that was rejected and sent back. Yes, there was, well not exactly rejected, but we refused to take some pieces and then they would be returned. In one case I remember a post that was crooked, that was returned, the rivets were all knocked out, the piece restraightened, and then brought before us again.

Prof. GALBRAITH.—Returned from where?

Mr. EDWARDS.—Returned from the finishing department back to the assembling department.

Prof. GALBRAITH.—That particular piece then was made right and again inspected?

Mr. EDWARDS.—Yes, sir, made right and again inspected and accepted.

Prof. GALBRAITH.—And shipped?

Mr. EDWARDS.—And shipped.

Prof. GALBRAITH.—Was any material returned to you from Quebec?

Mr. EDWARDS.—None whatever.

Prof. GALBRAITH.—Did you hear at any time any complaints from the Quebec end of material arriving that was not perfect?

Mr. EDWARDS.—The only one I recall now was with respect to painting, that was the greatest trouble we had from the field, they claimed there were spots that were not painted.

Prof. GALBRAITH.—Was there an instance of complaint arising from any structural feature?

Mr. EDWARDS.—On the anchor arm there was one complaint in regard to a truss floor beam that the holes did not come exactly right, that is the only one I remember on the whole anchor arm; and on the cantilever arm, when they went to put in the end posts, there were some plates there that did not exactly gee, and they had to chip off about half an inch there, after which they went into place. These are the only two things I recall now of any complaints in regard to workmanship.

Prof. KERRY.—What method had you to ensure that only inspected material was shipped?

Mr. EDWARDS.—The material at the mills was stamped as well as the finished material and besides that the inspector reported to me continually. There was nothing that had gone on the cars without he received copies of the invoice; he knew exactly what was shipped on each car, and if anything was put on there which was defective, which he had not passed, he would advise me.

SESSIONAL PAPER No. 154

Prof. KERRY.—That is to say each shipment was systematically checked!

Mr. EDWARDS.—Each shipment, and copies of these shipments were sent to me.

Prof. KERRY.—You knew from the invoice that the material had been inspected?

Mr. EDWARDS.—I knew that or I would not accept it, and there were the reports I later received from the inspector.

Mr. HOLGATE.—Will your reports show any details as to how the final inspection was made before putting your mark on it?

Mr. EDWARDS.—No, sir, the reports will not show that; the monthly reports will simply show what progress is made in the shop during the month and about what the state of affairs was in order to keep Mr. Hoare advised regarding what they were doing. They do not show anything in regard to the quality.

Prof. KERRY.—Nothing in regard to quality?

Mr. EDWARDS.—I mean as regards the shop inspection, the monthly reports from the shop I referred to.

Mr. HOLGATE.—Simply the fabrication reports?

Mr. EDWARDS.—Simply the fabrication reports.

Mr. HOLGATE.—They referred more to the progress of the work and what was being done in the way of shipping?

Mr. EDWARDS.—Yes, sir.

Prof. KERRY.—The monthly reports will show fully the quality of the material?

Mr. EDWARDS.—Fully, yes, sir.

Prof. GALBRAITH.—Did you test and report on the plate of which the bridge pieces were built up as well as the riveted up pieces?

Mr. EDWARDS.—Yes, sir, the reports of all plates have been submitted, the reports of tests on these plates.

Prof. GALBRAITH.—Did you check the templets as well as the completed work, Mr. Edwards?

Mr. EDWARDS.—No, sir, we did not check templets. We checked tapes and we rejected a number; we refused to allow them to be used before they were absolutely correct with the standard.

Prof. GALBRAITH.—That is, you rejected a number of tapes?

Mr. EDWARDS.—Yes, sir.

Prof. GALBRAITH.—Were these steel tapes?

Mr. EDWARDS.—Yes, sir, George Eddy's steel tapes.

Mr. HOLGATE.—Were the members tested by yourself for straightness and general condition before they were loaded on the cars?

Mr. EDWARDS.—Yes, sir, they were inspected by us for these conditions.

Mr. HOLGATE.—And what was the process after they left your hands?

Mr. EDWARDS.—After they left our hands they were put into the hands of the shipper and loaded on cars and they were usually given another inspection on the cars, a general inspection, not in detail.

Mr. HOLGATE.—A general inspection simply to ascertain that the loading had been done in a proper way?

Mr. EDWARDS.—Well, we did not inspect the loading probably as much as we did to see that they were properly painted and that there was nothing that had escaped us in the shop.

Mr. HOLGATE.—What can you say about the methods that were used in loading with reference to the safe carrying of the members?

Mr. EDWARDS.—Unusual precautions were taken in that way. Drawings had been furnished by the Phoenix Bridge Company to their shipper and he was supposed to follow those implicitly, and besides that the railway companies had not only their inspectors, but had men in higher authority there to watch the loading before they allowed the cars to leave the works.

Mr. HOLGATE.—Do I understand that the Phoenix Bridge Company had a plan showing how the members should be loaded on the cars?

Mr. EDWARDS.—For the larger and heavier members.

7-8 EDWARD VII., A. 1908

Prof. GALBRAITH.—You mean apparently that only pieces of a definite specified kind could be loaded on one car ?

Mr. EDWARDS.—Well, usually it would take more than one car, the pieces were so heavy.

Prof. GALBRAITH.—On one or more cars ?

Mr. EDWARDS.—On one or more cars, and where they were unusually heavy or long these special instructions were issued.

Mr. HOLGATE.—I think you told us, Mr. Edwards, that the specifications you worked under you received from the Phoenix Bridge Company, but did you not get some specifications from Mr. Hoare direct ?

Mr. EDWARDS.—I have no recollection of any.

Mr. HOLGATE.—But from time to time you received instructions from both Mr. Cooper and Mr. Hoare with regard to the standard of the inspection ?

Mr. EDWARDS.—Yes, sir, I did from both Mr. Cooper and Mr. Hoare.

Mr. HOLGATE.—And were they written or verbal ?

Mr. EDWARDS.—Verbal for the most part, I think.

Mr. HOLGATE.—And the result of the whole was carried out in the final inspection of the materials ?

Mr. EDWARDS.—Yes, sir.

Mr. HOLGATE.—Were these amended instructions received after the manufacture of the material was commenced ?

Mr. EDWARDS.—Yes, sir.

Mr. HOLGATE.—At what period then were any amended instructions given ?

Mr. EDWARDS.—Well, about—I do not recollect the exact time, but about six or seven months after we started on the work there was a change made in the specifications of the eye-bars.

Mr. HOLGATE.—Did it only affect eye-bars ?

Mr. EDWARDS.—I think it did.

Mr. HOLGATE.—Have you notes of what these changes were ?

Mr. EDWARDS.—You mean have I written instructions with regard to them ? I know exactly what they were; instead of having a low limit of 60,000 pounds per square inch the low limit was changed to 62,000 pounds.

Mr. HOLGATE.—I understand these instructions were verbal ?

Mr. EDWARDS.—I think they were.

Mr. HOLGATE.—Were these reports all signed by you, Mr. Edwards ?

Mr. EDWARDS.—I think Mr. Meeser's name is on some of them, although I made them all up.

Mr. HOLGATE.—Then Mr. Meeser did sign some ?

Mr. EDWARDS.—He did not sign the reports that were sent to Mr. Hoare, he signed the reports that were sent to me, and then I would recopy them and send them on.

Prof. GALBRAITH.—With your signature ?

Mr. EDWARDS.—With my signature, and in some cases in the early part of the work, I think I left his signature; I put his signature to them; his signature is on some although they were written by me.

Mr. HOLGATE.—That is to say, they were actually signed by him or did you write his name ?

Mr. EDWARDS.—I wrote his name.

Mr. HOLGATE.—And wrote 'signed.'

Mr. EDWARDS.—I think my initials are to them.

Witness retired.

SESSIONAL PAPER No. 154

IRVIN W. MEESER, sworn.

Mr. HOLGATE.—What are you?

Mr. MEESER.—Inspector for the Quebec Bridge and Railway Company.

Mr. HOLGATE.—At Phoenixville?

Mr. MEESER.—Phoenixville.

Mr. HOLGATE.—And your duties comprise?

Mr. MEESER.—Comprise seeing that the work is made like the drawings, that the workmanship is all right, that the rivets are tight, that the whole thing is made as per drawings.

Mr. HOLGATE.—Who appointed you?

Mr. MEESER.—Mr. Edwards.

Mr. HOLGATE.—And to whom do you report?

Mr. MEESER.—Mr. Edwards.

Mr. HOLGATE.—Were your duties confined to the fabrication?

Mr. MEESER.—Yes, sir.

Mr. HOLGATE.—And what generally were your methods of checking?

Mr. MEESER.—Well, in using our tape line, our long measurements, we had a tape line that had been examined by the master tape used by the shop, all tapes were regulated by that, and we had an appliance put on the line at the foot mark, and we used a 4-foot steel scale to set it by, and that was held on by a man, one of the assistants in the bridge company's employ, and the chief inspector and myself would read it. On the other end we had an appliance made with a scales on and we always pulled a certain number of pounds, which was carried out from one end to another in all departments; we all pulled 10 pounds, and he would read it while I would pull it, and I would read it while he would pull it, and after we both read it, we would both go up and tell one another what we made it. We never told each other until we both made measurements. If it was necessary in measuring, he could call any number of men to hold it in line, he had that permission.

Mr. HOLGATE.—Were errors discovered?

Mr. MEESER.—Yes, sir.

Mr. HOLGATE.—How were they corrected?

Mr. MEESER.—They were corrected in some cases by the pieces that were connected to them being made to suit that member.

Mr. HOLGATE.—The member then would not be altered itself, but the joining members would be corrected?

Mr. MEESER.—In some cases it was, in some cases not.

Mr. HOLGATE.—The drawings that were furnished to you, were they found to work out in the fabrication?

Mr. MEESER.—Yes, sir.

Mr. HOLGATE.—Did matters arise in the shop where the drawings erred?

Mr. MEESER.—I cannot recollect that there was any.

Mr. HOLGATE.—What we want to know is whether the drawings that were furnished to the shop, and which you inspected by, were correct drawings for the purpose?

Mr. MEESER.—Yes, sir.

Mr. HOLGATE.—Well considered?

Mr. MEESER.—Well considered.

Mr. HOLGATE.—During the fabrication of the material, were the appliances of the Phoenix Bridge Company's shop ample for the handling of all the parts?

Mr. MEESER.—I think the best.

Mr. HOLGATE.—The best that you know of?

Mr. MEESER.—That I have ever seen, yes, sir.

Mr. HOLGATE.—Are you generally familiar with plans of that nature?

Mr. MEESER.—I had been travelling from one plant to the other before I went with these people.

7-8 EDWARD VII., A. 1908

Mr. HOLGATE.—Then in the using of these appliances what care was used?

Mr. MEESER.—Well, all care was taken that nothing could be hurt in any way, shape or form. When they put the chains around they made all kinds of supports between the irons so they could not bend or buckle, and I think all the way through every care was exercised so that the pieces would not be injured in any way.

Mr. HOLGATE.—Was there any injury to any piece that took place in the shops?

Mr. MEESER.—There was one.

Mr. HOLGATE.—One? Have you any recollection of that?

Mr. MEESER.—I do.

Mr. HOLGATE.—Can you specify?

Mr. MEESER.—Well, they were carrying a chord across the yard and it fell, the chain broke, or if the chain did not break the teeth failed and it fell down.

Mr. HOLGATE.—Have you a record to show what part that was?

Mr. MEESER.—It was chord 10 of 622 on the north side, now in the Belair yard.

Mr. HOLGATE.—Now in the Belair yard?

Mr. MEESER.—Yes, sir.

Mr. HOLGATE.—Was it damaged to any extent?

Mr. MEESER.—It was bent, there was nothing broken about it, it was bent.

Mr. HOLGATE.—And what did you do when that occurred?

Mr. MEESER.—I called Mr. Edwards; he came up and looked at it, and took it up I think with his superior.

Prof. GALBRAITH.—What does that No. 622 mean?

Mr. MEESER.—622, it is the order. That is the way we have, all even numbers are on one side and all the odd numbers on the opposite side. 621 is in the side now that has fallen, the cantilever arm; No. 622 will be on the opposite side of the river. That is the Bridge Company's order, and that is the way we could tell.

Mr. GALBRAITH.—What was done with regard to that chord piece itself, Mr. Meeser?

Mr. MEESER.—It was straightened.

Prof. GALBRAITH.—And afterwards inspected by you?

Mr. MEESER.—Yes, sir.

Prof. GALBRAITH.—And found satisfactory?

Mr. MEESER.—Yes, sir.

Mr. GALBRAITH.—Did you immediately supervise the shipping or loading?

Mr. MEESER.—Not until it was thoroughly inspected by all parties concerned.

Prof. GALBRAITH.—But the actual loading on the cars, would you see the material after it was loaded on the cars?

Mr. MEESER.—Not in all cases, but I tried to make it a point to do so whenever I possibly could.

Prof. GALBRAITH.—Mr. Edwards has told us about the system used in connection with the loading of cars?

Mr. MEESER.—Yes, sir.

Prof. GALBRAITH.—Can you give us any further explanation of that?

Mr. MEESER.—On each piece of any size there was a drawing made giving full instructions to the chief shipper how it was to be loaded. With smaller members he used his own judgment.

Prof. GALBRAITH.—And what can you say as to the carrying out of those directions?

Mr. MEESER.—I think they were lived up to to the letter. The railway companies had their inspectors on the ground all the time, the cars were thoroughly gone over and if any question came up between the Bridge Company's representatives or the chief shipper and the inspectors, they sent for their chief inspectors, who were very often on the ground to make matters satisfactory to both parties before a car would leave the plant.

Prof. GALBRAITH.—Now with regard to the process of manufacture in the shop,

SESSIONAL PAPER No. 154

generally speaking, how was the work done? Did you have any difficulty in forcing your ideas of the specifications, in having the matter carried out?

Mr. MEESER.—I had not.

Prof. GALBRAITH.—With regard to the assembling and riveting how did you find the work complying with your wishes?

Mr. MEESER.—Good.

Prof. GALBRAITH.—Sufficiently good to warrant your accepting it when it was completed?

Mr. MEESER.—Yes, sir, extreme care was taken on this.

Prof. GALBRAITH.—In what way?

Mr. MEESER.—Every way, all the way through, in all parts, all departments. They had all received special instructions to make this, I might say a master job. Outside inspectors had come there and said they had received better results since our own job was started on their own work.

Prof. GALBRAITH.—And these reports that Mr. Edwards refers to, you had knowledge of so far as the fabrication is concerned?

Mr. MEESER.—The reports I had nothing to do with.

Prof. GALBRAITH.—Was there any flanging or hot work, blacksmith work necessary in any part of the fabrication?

Mr. MEESER.—In some, yes, sir.

Prof. GALBRAITH.—What care was taken with respect to plates on which that work was done, after the flanging or other operation, with respect to cooling I mean?

Mr. MEESER.—They were let lie right down on the ground after they were finished, not on the ground but on beams that were there. They were let lie there until perfectly cool; we would not allow them to make them too hot.

Prof. GALBRAITH.—Care was taken about the temperature to which they were heated?

Mr. MEESER.—Yes, sir.

Prof. GALBRAITH.—What about winter work? Were any precautions taken to prevent them from being cooled too suddenly in the winter? Were any pieces thrown down into the snow?

Mr. MEESER.—Not that I know of; it is all under the roof where this is done.

Prof. GALBRAITH.—Or were they exposed to rain or wet while cooling.

Mr. MEESER.—No, it is all under roof.

The witness retired.

HORACE M. CLARK, sworn.

Mr. HOLGATE.—Mr. Clark, are you an employee of the Phoenix Bridge company?

Mr. CLARK.—Yes, sir.

Mr. HOLGATE.—Are you connected with the work of the Quebec bridge?

Mr. CLARK.—Yes, sir.

Mr. HOLGATE.—In what capacity?

Mr. CLARK.—Foreman in charge of the storage yard.

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

Mr. CLARK.—Since October 26, 1904.

Mr. HOLGATE.—Your duties confined you to the storage yard?

Mr. CLARK.—Yes, sir.

Mr. HOLGATE.—Now, with regard to your duties, what do they cover?

Mr. CLARK.—They cover the unloading, the reception of the metal, the unloading, checking and storing it away and sending it to the bridge.

Mr. HOLGATE.—That is reloading.

Mr. CLARK.—Yes, sir, reloading and sending it to the bridge as it was required for daily erection.

154—vol. ii—104

7-8 EDWARD VII., A. 1908

Mr. HOLGATE.—And in doing that you would have to handle all these parts twice?

Mr. CLARK.—Yes, sir.

Mr. HOLGATE.—What were your facilities for handling?

Mr. CLARK.—We had two electric cranes of 75 tons capacity each.

Mr. HOLGATE.—What was the weight of your heaviest piece handled?

Mr. CLARK.—The heaviest piece handled was about 98 tons, No. 10 chord section in the cantilever arm.

Mr. HOLGATE.—When you speak of checking, do that refer to checking quantities or dimensions.

Mr. CLARK.—It refers to taking the amount of material that comes in on the different cars to check them to see that they check with the invoice from the shipper?

Mr. HOLGATE.—It refers in no way to checking the dimensions of the parts?

Mr. CLARK.—No, sir, it just refers to the marks, the shipping marks and marks in connection with erection.

Mr. HOLGATE.—In handling the heavy parts were you always able to do it successfully or had you any trouble?

Mr. CLARK.—Well, we never had any trouble, except with one chord section that we had a misfortune with.

Mr. HOLGATE.—What happened?

Mr. CLARK.—It was chord section 9 L anchor arm. One of the hooks broke, a connecting link on a hook broke and the chord section dropped on to the ground, striking a plate.

Prof. GALBRAITH.—At one end?

Mr. CLARK.—At one end, yes, sir. The splice plates were on the chord, that is the web splice plates were on the chord, and they struck a plate that we used in the yard, and the leverage on the plates broke two of the angles on the bottom of that rib.

Prof. GALBRAITH.—Struck edgewise or sideways?

Mr. CLARK.—Directly on the top side of the chord.

Prof. GALBRAITH.—Edgewise of the splice plates.

Mr. CLARK.—Edgewise, yes.

Mr. HOLGATE.—And was it one end of this piece that fell or the whole piece?

Mr. CLARK.—Both ends. One end fell on a pile of eye-bars and the other one fell 18 inches or 2 feet more.

Mr. HOLGATE.—How far did it fall?

Mr. CLARK.—Possibly 5 feet.

Prof. GALBRAITH.—How many falls were on the chord?

Mr. CLARK.—There were two cranes.

Prof. GALBRAITH.—And both broke?

Mr. CLARK.—No, one broke and that loosened the other one.

Prof. GALBRAITH.—So you let the whole chord fall?

Mr. CLARK.—Yes, sir, practically the whole chord.

Prof. GALBRAITH.—It struck one end first and struck sideways the rest.

Mr. CLARK.—Yes, sir.

Prof. GALBRAITH.—The other end did not strike the ground directly?

Mr. CLARK.—No, sir, the other end did not strike more than 20 inches.

Prof. GALBRAITH.—In handling this material had you any specific instructions?

Mr. CLARK.—Yes, sir.

Prof. GALBRAITH.—As to how to handle it?

Mr. CLARK.—Yes, sir.

Prof. GALBRAITH.—In what form were those instructions given to you?

Mr. CLARK.—For some of the principal members, all the chord sections, there are 60 ton hooks designed for the handling of them, and we have the two cranes and use them to handle them, that is a 60 ton hook on each end of the chord, thus giving us all the scope we needed.

SESSIONAL PAPER No. 154

Prof. GALBRAITH.—That is what you did?

Mr. CLARK.—Yes, sir.

Prof. GALBRAITH.—But were you instructed to do that?

Mr. CLARK.—Oh yes, we had two cranes. The hooks could not have been used at that time, only on two cranes.

Prof. GALBRAITH.—Were there specific instructions given you with regard to the handling of that material from the car?

Mr. CLARK.—Not all of them, the lighter members, of course there would not be anything given for that but the heavier members there was.

Prof. GALBRAITH.—Where did you get those instructions from?

Mr. CLARK.—We got the instructions from the blue prints and from the general plans. We have all the blue prints at the storage yard that we had at the bridge so far as the erection and handling of the metal is concerned.

Prof. GALBRAITH.—These were the instructions that you refer to as blue prints followed?

Mr. CLARK.—Yes, sir.

Prof. GALBRAITH.—And in carrying out that work did you find these instructions ample for the handling of these parts?

Mr. CLARK.—Yes, sir.

Prof. GALBRAITH.—Is it usual on your work to receive instructions of that nature?

Mr. CLARK.—Well, not on smaller work we do not receive it, but on a work of this kind it is something unusual, and the instructions have been given and we have positive orders not to do anything only just what we get instructions to do, especially on a heavy member.

Prof. GALBRAITH.—Then you handle those members in the yard in accordance with the instructions you receive on blue prints that were furnished to you by whom?

Mr. CLARK.—The Phoenix Bridge Company.

Prof. GALBRAITH.—By whom at the Phoenix Bridge Company.

Mr. CLARK.—All blue prints and instructions come direct to the general foreman, and are turned over to the different foremen under him.

Prof. GALBRAITH.—Who was your immediate foreman on the work?

Mr. CLARK.—Mr. Yenser.

Prof. GALBRAITH.—With regard to this particular chord that you refer to, was it the only case of damage done to a member in the course of handling?

Mr. CLARK.—Yes, sir.

Prof. GALBRAITH.—When this happened what was done in the way of rectifying the matter?

Mr. CLARK.—It was repaired in the following spring, I think about May or June, I could not tell exactly. I could tell it was according to the Phoenix Bridge Company's tool order No. 200.

Prof. GALBRAITH.—Did you have to do with repairs?

Mr. CLARK.—It was under my supervision, yes, sir.

Prof. GALBRAITH.—And the repairs were done in the yard?

Mr. CLARK.—Yes, sir.

Prof. GALBRAITH.—Would you give us the date of that accident?

Mr. CLARK.—I cannot give you exactly. There is a record I presume in the Phoenix Bridge Company's office, but it was in April, I am almost positive.

Prof. GALBRAITH.—In what year?

Mr. CLARK.—1905.

Prof. GALBRAITH.—And the repairs were made the next spring?

Mr. CLARK.—Just a minute, 1905, the repairs were made that same spring.

Prof. GALBRAITH.—How long after the accident was the repair made, and when?

Mr. CLARK.—It was in the same year, two months and a half later. Of course, these repairs covered quite a few days. I could not give the exact date when the repairs were made

Mr. HOLGATE.—The repairs were made, though ?

Mr. CLARKE.—Yes, sir.

Mr. HOLGATE.—Will you describe just what you did, shortly ?

Mr. CLARK.—The angles that were broken were cut off.

Mr. HOLGATE.—Which angles—the flange angles ?

Mr. CLARK.—The main angles in the chord section. I cannot give the exact locality now. The sheets will give that.

Mr. HOLGATE.—On the outside rib are the details of the work described on the tool order ?

Mr. CLARK.—Yes, sir.

Mr. HOLGATE.—Will that describe it fully ?

Mr. CLARK.—Yes.

Mr. HOLGATE.—Can we get a copy of that ?

Mr. CLARK.—They are at the Bridge Company's office, I think.

Mr. HOLGATE.—You may, as nearly as you can recollect it now, give a description of it.

Mr. CLARK.—As near as I can recall it there were two angles broken and they were broken on the bottom of the chords. I cannot just recall whether they were outside or inside angles. I know one of them was an inside angle but the exact distance from the chord splice I cannot give without the tool order. But the chords were cut off and the splice made with perfect joints clipped and filed to the satisfaction of the engineer.

Mr. HOLGATE.—Who was the inspector ?

Mr. CLARK.—Mr. Kinloch. The work was finished and the chord sections sent to the bridge at the proper time when it was required in the structure. Further, the work is there to show for itself. That entire end of the chord section is intact and can be seen at this time.

Prof. GALBRAITH.—That was the end of chord 9 joined to 10 ?

Mr. CLARK.—On the west side of the anchor arm.

Mr. HOLGATE.—What inspection was given to your work by the Quebec Bridge Company ?

Mr. CLARK.—My work was usually inspected before it was erected. The inspectors usually got on the cars at the bridge and inspected the work that I had done—either Mr. McLure or Mr. Kinloch. They would make frequent visits to the yard and look over the work generally.

Mr. HOLGATE.—Who, besides Mr. Kinloch, did inspect chord A 9L after the repairs ?

Mr. CLARK.—I would not be sure whether Mr. Kinloch had Mr. Hoare with him or not, but it seems to me that Mr. Hoare came to the yard one day to look over the repairs. I would not be positive.

Mr. HOLGATE.—But nobody else that you recollect ?

Mr. CLARK.—No, sir.

Mr. HOLGATE.—Do you recollect Mr. McLure inspecting it ?

Mr. CLARK.—No, I do not.

Mr. HOLGATE.—Do you recollect Mr. Hudson being there ?

Mr. CLARK.—Yes, sir.

Mr. HOLGATE.—Did he see it ?

Mr. CLARK.—Yes, and Mr. Szlapka was with him at the same time.

Mr. HOLGATE.—I understand that that was after it had been repaired ?

Mr. CLARK.—No, sir, before.

Mr. HOLGATE.—Did Mr. Hudson see it afterwards ?

Mr. CLARK.—No, sir, I do not think so. I would not be sure whether Mr. Hudson saw it afterwards or not.

Mr. STUART.—I understand Mr. Hudson was there during the repair.

Mr. HOLGATE.—Was Mr. Hudson there during the repair ?

SESSIONAL PAPER No. 154

Mr. CLARK.—I could not say as to that positively whether he was or not. The chord was looked over very carefully by Mr. Hudson and Mr. Szlapka before the repairs were made to it and looked over by different people at different times. I cannot recall who all were there.

Mr. HOLGATE.—Was your method of handling this chord different from that of handling similar chords?

Mr. CLARK.—No, sir.

Mr. HOLGATE.—Was there a chain used in connection with the handling of this chord?

Mr. CLARK.—No, sir.

Mr. HOLGATE.—In making the repair of the chord to what extent had you to use heat?

Mr. CLARK.—There was a Wells light put on the bend, on the angle almost opposite to where the repairs were made and that particular bend was taken out. The angle was bent in almost opposite the point of repair and that bend was taken out. We put a Wells light on it and we tried to get it warm enough to bend it back, but failing we did away with the heat and straightened it out with a ram.

Mr. HOLGATE.—By whose instructions were the details of these repairs carried out?

Mr. CLARK.—I think that the notes for the repairs were taken by Mr. Szlapka and Mr. Hudson. The two orders for the repairs, I think, you will find were given by Mr. Scheidel.

Mr. HOLGATE.—Will that order completely specify the method to be used in making these repairs?

Mr. CLARK.—Yes, sir; it does not tell you how to do the work, but it specifies the repairs.

Mr. HOLGATE.—Does it specify that the parts had to be heated?

Mr. CLARK.—No, sir. The reason that I abandoned heating was that we could not heat it with the Wells light. That was my own idea, and we could not get heat enough on it to straighten it with the Wells light, and so I abandoned that and straightened it with a ram.

Mr. HOLGATE.—Apart from using the Wells light, heat was not used?

Mr. CLARK.—No, sir.

Mr. HOLGATE.—And you found the Wells light would not give sufficient heat to be of much use to you?

Mr. CLARK.—It would not give you enough heat.

Prof. GALBRAITH.—It was practically a cold bend?

Mr. HOLGATE.—What was the rule in regard to forwarding parts from the storage yard to the bridge?

Mr. CLARK.—Entirely laid out on our erection blue prints.

Mr. HOLGATE.—Upon whose instructions would you forward material to the bridge?

Mr. CLARK.—We had instructions to go by. I would know daily what was built up at the bridge and what would be required in rotation from the erection blue prints. We had a diagram to go by of the sections of the whole bridge and as for the minor details, little connections and pieces like that I would have to get these out myself.

Mr. HOLGATE.—When these parts were wanted at the bridge, would you be advised by Mr. Yenser?

Mr. CLARK.—If the order of erection would be changed from that print?

Mr. HOLGATE.—I mean that if he were ready for these parts, would he send you word that these parts were required?

Mr. CLARK.—No, we had to work a good deal ahead of them sometimes to have them ready, and they would go out sometimes before they were ready.

Mr. HOLGATE.—Who inspected these parts before they were forwarded to the bridge?

Mr. CLARK.—Nobody but myself.

7-8 EDWARD VII., A. 1903

Mr. HOLGATE.—Was there no inspection made in the storage yard by the Quebec Bridge Company?

Mr. CLARK.—Only in a general way, not a daily inspection, but the inspectors would look over the various members as they came up to the bridge.

Prof. GALBRAITH.—They inspected them at the bridge and not at the yard?

Mr. CLARK.—Yes, sir.

Mr. HOLGATE.—Did you consider it necessary to have the Quebec Bridge Company's inspection before you forwarded the various parts to the bridge?

Mr. CLARK.—No, sir.

Mr. HOLGATE.—How did you keep track of the members as you shipped them to the bridge?

Mr. CLARK.—I checked them off from the erection diagram.

Mr. HOLGATE.—On the diagram itself?

Mr. CLARK.—Yes, sir.

Mr. HOLGATE.—Would that give the date when they were forwarded?

Mr. CLARK.—No, sir.

Mr. HOLGATE.—It would merely state that they had been sent?

Mr. CLARK.—That is all.

Mr. HOLGATE.—When you refer to an occasional inspection on the part of the Quebec Bridge Company in the yard, what individuals do you refer to?

Mr. CLARK.—Mr. McLure and Mr. Kinloch and occasionally a visit from Mr. Hoare, not as an inspector, but as taking a general observation.

Mr. HOLGATE.—Were there any occasions when they refused to permit the material to go from the yard to the bridge?

Mr. CLARK.—Not to my knowledge.

Mr. HOLGATE.—In the usual course this chord that you referred to was forwarded to the bridge?

Mr. CLARK.—The same as any other chord.

Mr. HOLGATE.—Have you any means of ascertaining, Mr. Clark, what of the material that you forwarded to the bridge had not been erected in the bridge at the time of the accident on the 29th of August?

Mr. CLARK.—There were only two members. There were two members I had just sent up that were not erected.

Mr. HOLGATE.—Which members were they?

Mr. CLARK.—Two sections of eye-bars—diagonal bars 20 in the suspended span.

Mr. HOLGATE.—Then I understand that all other material that had left the yard at that time had been erected in the structure and that only these chord bars had been forwarded and remained unerected and not yet placed in the structure?

Mr. CLARK.—Yes, sir. As I understand it, one set of bars had already been run to the front and the engine was going to the front with the last section.

Mr. HOLGATE.—What material yet remains in the yard?

Mr. CLARK.—The balance of the suspended span for the south half.

Mr. HOLGATE.—Have you any record, Mr. Clark, of material having gone to the bridge and having been returned to the storage yard?

Mr. CLARK.—Yes, sir.

Mr. HOLGATE.—What have you reference to?

Mr. CLARK.—I have reference to U.S., V. 4. I think that is it. It was wrong side up.

Mr. HOLGATE.—In regard to this piece, you sent it, you say, wrong end on?

Mr. CLARK.—No, it was wrong side up. It was for the right side and I had it turned over to the left side. I had it turned wrong side up for the inner chord. It was just a matter of bringing it back and turning a five or six ton piece over; we turned it over on the same car, and it was not more than five minutes' work.

Mr. HOLGATE.—Are there any other cases of material being returned?

Mr. CLARK.—Not to my knowledge.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—What became of the eye-bars that were run forward? They were not erected?

Mr. CLARK.—In the river, I guess.

Mr. HOLGATE.—Then, as I understand it, these eye-bars would be the only material on the bridge as far as you know that had not been erected in the structure?

Mr. CLARK.—These two sections of eye-bars.

Mr. HOLGATE.—You have no recollection of anything being run back off the bridge before the accident happened?

Mr. CLARK.—No, sir.

Mr. HOLGATE.—You would have known if it had taken place?

Mr. CLARK.—There would not be anything to come back. The two chord sections were sent up and were in place and were being connected and there was nothing to send up between the chord sections and these eye-bars.

Mr. HOLGATE.—Is there any point, Mr. Stuart, you would like to mention?

Mr. STUART.—I have nothing.

Mr. DAVIDSON.—I understand that Mr. Clark is now speaking of the 29th, but Mr. Haley stated that these stringer pieces were sent back on the 28th.

Mr. HOLGATE.—Mr. Clark has stated that to his knowledge no material was sent back except this one piece of the post that was returned.

Mr. DAVIDSON.—Mr. Haley did not say they were sent back to the storage yard. They were sent back off the bridge—I do not know where to. Mr. Clark probably would not know this.

Mr. HOLGATE.—Have you any knowledge in regard to the return from the bridge of material that was intended for this erection or material which was connected with the apparatus for erection on the 28th of August?

Mr. CLARK.—Yes, there was one of the erection spans, that is the working span, sent back and put in on the side track until next day. I frequently would load these spans a day ahead. I frequently loaded various members a day ahead and sent them up; they would not be ready for them, and they would return them and put them on the side track until they were ready for them. I think it was the day before that I had loaded the erection span and sent it up, and Mr. Yenser had the crew return it and it was thrown on the side track until next day.

Mr. HOLGATE.—Had that been done before?

Mr. CLARK.—Possibly it had; I could not say positively. We used to have a side track there up in the cut, but not this year, that they probably would throw things in to hold them temporarily until they could take care of them on the bridge. In my work I worked as much as a month ahead on some of the members to prepare them and frequently a member would be run up before they were ready for it and it would be thrown in on the side track until such time as they could take care of it.

Mr. HOLGATE.—When these erection girders were returned from the bridge would they then be under your care?

Mr. CLARK.—Well, no; they just lie on the side track subject to the orders at the front.

Mr. HOLGATE.—Have you any knowledge as to why they were returned?

Mr. CLARK.—No, sir; no more than that they were not ready for them.

Prof. GALBRAITH.—Have you a record of everything returned to the side track?

Mr. CLARK.—No, sir.

Prof. GALBRAITH.—Have you any means of knowing what is in the side track officially without simply paying a chance visit?

Mr. CLARK.—Not from day to day. I do not keep any record.

Mr. HOLGATE.—How far is the storage yard from the side track?

Mr. CLARK.—About half a mile.

Mr. HOLGATE.—Your duties keep you at the storage yard constantly?

Mr. CLARK.—Yes, sir.

Mr. HOLGATE.—Have you any duties which would take you to the siding where these cars are thrown in?

7-8 EDWARD VII., A. 1908

Mr. CLARK.—No, they are opposite the storage yard, possibly 300 or 400 feet away.

Mr. HOLGATE.—So that you would see the cars when they were returned?

Prof. GALBRAITH.—Do I understand that this side track that you speak of is one track and the siding is another track near the storage yard?

Mr. HOLGATE.—I think that what Mr. Clark means is that the siding where these cars were thrown in is 300 or 400 feet from the storage yard.

Mr. CLARK.—Probably 300 or 400 feet. It used to be the main line and it was used for storage purposes.

Mr. HOLGATE.—What do you mean by half a mile?

Mr. CLARK.—The storage yard is half a mile from the bridge.

Prof. GALBRAITH.—And this siding is somewhat less?

Mr. CLARK.—Yes, about 300 feet.

Mr. HOLGATE.—Did you see Mr. Yenser on the 28th?

Mr. CLARK.—Yes, I saw Mr. Yenser every day.

Mr. HOLGATE.—Did Mr. Yenser refer in any way to the return of these cars?

Mr. CLARK.—No, sir.

Mr. HOLGATE.—Have you any knowledge as to why he returned them?

Mr. CLARK.—I asked the brakeman why he brought them back and he said they were not ready for them.

Mr. HOLGATE.—Who is the brakeman?

Mr. CLARK.—Homer Fontaine.

Mr. DAVIDSON.—Before you pass to another point, I would like you to ask this witness if it is not within his knowledge that there was a good deal of commotion amongst the men about these cars being sent back and a good deal of unrest—a good deal of feeling about them?

Mr. HOLGATE.—Did you hear comments made by any one in regard to the returning of the cars with the erection span on them?

Mr. CLARK.—Not until this time.

Mr. HOLGATE.—Until when?

Mr. CLARK.—Until the gentleman speaks of it now.

Mr. HOLGATE.—I would not refer to Mr. Davidson's conversation. You did not hear it.

Mr. CLARK.—All right.

Mr. HOLGATE.—Did you hear any comments?

Mr. CLARK.—No, sir, I never heard until this day why these girders came back.

Mr. HOLGATE.—None of the men commented on the matter to you?

Mr. CLARK.—No, sir; in my position I do not come into contact with them but very little; for this reason, that the men who boarded with me were, two of them, engineers, and one of them an apprentice, and I know that they did not mention anything in the house in relation to these girders going back. Most of the men lived in Liverpool, and I did not come into contact with any of them, and I never have, up to this time, heard anything as to why these girders went back. I never knew they were in question.

Mr. HOLGATE.—The only thing you can tell us is that the brakeman told you the reason they were sent back was that they were not ready for them at the front?

Mr. CLARK.—Yes, Mr. Yenser told him to take them back, they were not ready for them.

Mr. DAVIDSON.—Is that brakeman alive?

Mr. CLARK.—No, sir.

Mr. HOLGATE.—Had you heard anything up to the 29th of August in regard to defects which were supposed to have existed in that structure?

Mr. CLARK.—Yes, sir.

Mr. HOLGATE.—What was the nature of the information you had?

Mr. CLARK.—The information I got in a general way was that No. 9 chords were buckling.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—A-9?

Mr. CLARK.—A-9, yes.

Mr. HOLGATE.—When did you hear that?

Mr. CLARK.—I could not say exactly. It might have been a day or two before the accident.

Prof. GALBRAITH.—Anything about the cantilever arm?

Mr. CLARK.—No, sir.

Mr. HOLGATE.—Who told you that, Mr. Clark?

Mr. CLARK.—I cannot recall who told me, but I questioned Mr. Birks on the day of the accident, possibly 15 or 20 minutes before the accident, and I asked him if there was any truth in what I heard. He said there was a bend in chord 9-L and to my recollection I think he said about an inch and five-eighths. And he also said: In spite of the fact that you and Mr. Kinloch may think that chord was entirely straight before it left the yard, it is my belief that the chord was in its present condition or nearly so when it went into the bridge.

Prof. GALBRAITH.—How long is it since that chord went into the bridge?

Mr. CLARK.—I could not give the exact date.

Prof. GALBRAITH.—Approximately?

Mr. CLARK.—It was 1905.

Mr. HOLGATE.—When Mr. Birks made that statement that it was in the same condition when it left the yard, what did you say?

Mr. CLARK.—I told him that he had a right to his own opinion and I had a right to mine, that from what I saw and from what others had seen I would retain my own opinion about the case. After that he got on the car and went to the bridge.

Mr. HOLGATE.—You checked that chord before it left the yard?

Mr. CLARK.—In a general way, yes.

Mr. HOLGATE.—Who else inspected it?

Mr. CLARK.—Mr. Kinloch.

Mr. HOLGATE.—Then, according to Mr. Birks' assertion at the time, there would have been a bend visible in the chord at the yard of an inch and five-eighths, you state?

Mr. CLARK.—That is what he told me about what the bend was, as nearly as I can recall. I could not recall the exact distance he did give.

Mr. HOLGATE.—Were there any other points that you ever heard reference made to, Mr. Clark?

Mr. CLARK.—No, sir.

Prof. GALBRAITH.—Did you see the fall of the bridge?

Mr. CLARK.—Nor, sir, I was at the yard at the time.

Prof. GALBRAITH.—Mr. Birks had just left you for the bridge?

Mr. CLARK.—Yes, about 15 minutes.

Prof. GALBRAITH.—Before the accident?

Mr. CLARK.—Yes.

Mr. HOLGATE.—In what condition did that chord leave the yard?

Mr. CLARK.—I have already answered that in a general way; from the observations I made of it, the chord was practically quite as good a chord as any other chord that ever left the yard.

Prof. GALBRAITH.—You had reason to make special observations in regard to that chord as it was the chord, I understand, which you were repairing in the yard?

Mr. CLARK.—Yes, sir.

Mr. HOLGATE.—Did you put a line on the chord?

Mr. CLARK.—No, sir. I do not think Mr. Birks saw the chord in the yard. I am not positive. I am not sure as to what time Mr. Birks came on the work.

Mr. HOLGATE.—Mr. Birks would see it going out on the bridge?

Mr. CLARK.—If he were here at that time. I cannot recall whether Mr. Birks was the engineer in charge at that time or not.

Mr. HOLGATE.—Would Mr. Birks have been there at that time, Mr. Deans?

Mr. DEANS.—When he first mentioned it I thought he was but it is possible that

7-8 EDWARD VII., A. 1908

our Mr. Hudson, our first assistant engineer, who was in the place occupied by Mr. Birks, may have seen the chord. He may have seen the chord and he superintended all the repairs of the chord. He was Mr. Szlapka's principal assistant.

Prof. GALBRAITH.—Do you remember whether he was here when the chord was placed in position?

Mr. DEANS.—It was either Mr. Hudson or Mr. Birks, because we always had an engineer on the ground. I think possibly it was Mr. Hudson.

Mr. CLARK.—I think Mr. Hudson was here when that chord was placed. I do not say exactly, but I think Mr. Hudson was here when that chord was placed.

Mr. HOLGATE.—Then Mr. Birks would have no personal knowledge?

Mr. STUART.—Except such as he would get from subsequent inspections after it was placed and what he said would be quite compatible with that, that there had been no change after it had been erected or since it had been in the bridge.

Prof. GALBRAITH.—If you had seen a deflection of an inch and five-eighths in the chord do you think you would have noticed it and been sure of it?

Mr. CLARK.—I think I would. An inch and five-eighths is quite a bit.

Witnessed discharged.

Commission adjourned to meet at ten a.m. Monday, September 16.

SEVENTH DAY.

QUEBEC, Monday, September 16, 1907.

The Commission resumed at ten a.m.

J. J. NANCE, sworn.

Mr. HOLGATE.—Were you an employee of the Phoenix Bridge Company on August 29th?

Mr. NANCE.—Yes, sir.

Mr. HOLGATE.—When did you commence work with the Phoenix Bridge Company in connection with the Quebec bridge work?

Mr. NANCE.—Two years ago last July past.

Mr. HOLGATE.—What was your position?

Mr. NANCE.—I was running the engine.

Mr. HOLGATE.—Were you running the engine all the time from the time you entered the service?

Mr. NANCE.—Yes. This summer, for a while, I was running lines.

Mr. HOLGATE.—What kind of lines?

Mr. NANCE.—Lines we were doing work with, hoisting and the like of that.

Mr. HOLGATE.—Working the tackle?

Mr. NANCE.—Yes.

Mr. HOLGATE.—You say you were running the engine. What engine?

Mr. NANCE.—One of the electric hoisting engines on the top of the little traveller.

Mr. HOLGATE.—You were engaged in doing that work on August 29?

Mr. NANCE.—Yes.

Mr. HOLGATE.—Were you there when the accident happened to the bridge?

Mr. NANCE.—Yes, sir.

Mr. HOLGATE.—You might tell us just what you observed at that time?

Mr. NANCE.—The only thing I knew was she went down so quick you did not have time to think of but very little. I went down from the top.

SESSIONAL PAPER No. 154

Prof. GALBRAITH.—You were near Mr. Haley?

Mr. NANCE.—Yes, sir.

Mr. HOLGATE.—Where was Mr. Haley?

Mr. NANCE.—Mr. Haley was out just on the fore jib giving signals to us on the engines we were on.

Prof. GALBRAITH.—Which way were you looking—straight to the north shore?

Mr. NANCE.—We faced that way.

Prof. GALBRAITH.—When the bridge began to go down?

Mr. NANCE.—Yes, sir.

Mr. HOLGATE.—You can really give no information as to what happened because you were in no position perhaps to observe at the time?

Mr. NANCE.—No, sir, I did not know anything about it. I knew very little after she started and the next second she was in the water and I was down in the water with it. I went to the bottom with the engine.

Prof. GALBRAITH.—Holding on?

Mr. NANCE.—Yes, to the controller handle.

Prof. GALBRAITH.—Were you struck by the wreck?

Mr. NANCE.—Yes, I have different injuries on me, in fact a muscle has pulled loose and a couple of ribs in the side—that is the worst, so the doctor told me.

Mr. HOLGATE.—Were you generally familiar with the whole bridge?

Mr. NANCE.—No sir. I have worked at anything I was put at, but I was never put at anything only the engines and on the lines. That is about all the work I ever did on the bridge. Probably half a day, or something like that, it would be raining, or something, and the engines were not running and I would be fitting up or working in the gang or anything that might be ready to do.

Mr. HOLGATE.—In your passing to and from the work, did you ever make any, what you would call, inspection, or was your attention called to anything in particular?

Mr. NANCE.—Yes, sir; on the day before we were going off the bridge after we came down from the work, from the top. We were walking off the bridge and many of our men on top there that day had been discussing quite a little in regard to a bent chord.

Mr. HOLGATE.—Who called your attention to it?

Mr. NANCE.—Mr. Cook was the first man. After we came down they went down on the chord.

Mr. HOLGATE.—They did?

Mr. NANCE.—Yes.

Mr. HOLGATE.—Who?

Mr. NANCE.—Mr. Cook and Mr. Haley, and I went on over the top of it. I did not go down on the chord, but they did.

Mr. HOLGATE.—What day was that?

Mr. NANCE.—On the 27th of August.

Prof. GALBRAITH.—That was two days before, then?

Mr. NANCE.—Yes.

Mr. STUART.—Did he say in the morning or the evening?

Mr. NANCE.—It was in the evening.

Mr. HOLGATE.—From your own knowledge you can tell us nothing about that detail?

Mr. NANCE.—No, sir, I do not remember very much of it, and I went down so quick.

Mr. HOLGATE.—I do not mean that; I mean in reference to this particular thing that Mr. Cook spoke to you about.

Mr. NANCE.—No, sir, I did not go down on that chord. All I heard them say was that they had heard the engineers say that it was bent.

Mr. HOLGATE.—Do you know which chord they referred to?

7-8 EDWARD VII., A. 1908

Mr. NANCE.—I think it was in around the third or fourth section from the big pier. That would make it about No. 9.

Mr. HOLGATE.—Outwards towards the river ?

Mr. NANCE.—Out near the water.

Mr. HOLGATE.—Was that in the anchor arm.

Mr. NANCE.—In the cantilever arm.

Mr. HOLGATE.—What impression did that information have on you at the time ?

Mr. NANCE.—I do not know; I was not in a position to know very much about it, but there were some of them who seemed to be interested. I was a little scared but I did not want to be the first man to walk off. I wanted to stay as long as the rest of them stayed.

Mr. HOLGATE.—Were you ever on the lower chord yourself ?

Mr. NANCE.—Yes, sir.

Mr. HOLGATE.—In any part of the bridge ?

Mr. NANCE.—Yes, sir.

Mr. HOLGATE.—What particular part ?

Mr. NANCE.—It was down on the pier in the first section, straight out over the water from the anchor.

Mr. HOLGATE.—At the anchor arm ?

Mr. NANCE.—Yes.

Mr. HOLGATE.—Which particular section have you reference to ?

Mr. NANCE.—I remember being on the upstream one. I went down to get a plank we wanted on the deck.

Mr. HOLGATE.—When was that ?

Mr. NANCE.—Last summer.

Mr. HOLGATE.—The summer of 1906 ?

Mr. NANCE.—Yes.

Mr. HOLGATE.—Why do you recall that particular incident ?

Mr. NANCE.—I was running the engine on the upstream side and we lost a couple of planks. One went overboard and one landed on the chord below and I went down to pull it up.

Mr. HOLGATE.—You did not go there for the purpose of looking at anything in particular in connection with the bridge ?

Mr. NANCE.—No, sir; I went there to put the hook on the plank and draw it up.

Mr. HOLGATE.—Did you observe anything peculiar with the bridge ?

Mr. NANCE.—No, sir.

Prof. GALBRAITH.—You are speaking now of a chord between the main pier and the shore ?

Mr. NANCE.—No, sir.

Mr. HOLGATE.—That is what I understand.

Mr. NANCE.—This was on the anchor arm, the first piece.

Prof. GALBRAITH.—Between the main pier and the shore ?

Mr. NANCE.—No, it is out over the water past the pier.

Prof. GALBRAITH.—It is past the pier towards the north shore ?

Mr. NANCE.—Yes.

Prof. GALBRAITH.—Then it is on the cantilever arm ?

Mr. NANCE.—Yes. Did you understand me to say that it was on the anchor ?

Mr. HOLGATE.—Yes.

Mr. NANCE.—It is just past the pier on the cantilever arm.

Mr. HOLGATE.—But, at any rate, you observed nothing at that time out of order ?

Mr. NANCE.—No, sir.

Mr. HOLGATE.—Did you observe anything at any other time out of order ?

Mr. NANCE.—No, sir.

Mr. HOLGATE.—Were you in a position to have noted these things if they had been there ?

Mr. NANCE.—Well, really, no sir, I was not, because where we were working you

SESSIONAL PAPER No. 154

were supposed to be at your work at seven o'clock, and it generally took about ten minutes to climb up there and the gang that worked up there never stopped any place down below to be sitting around.

Mr. HOLGATE.—In regard to the apparatus for hoisting, was it what you would call good reliable tackle ?

Mr. NANCE.—Yes, sir, the one I was running was as good as I ever saw.

Mr. HOLGATE.—You would say that it was suitable for the work that was being done ?

Mr. NANCE.—Yes, sir, it was.

Mr. HOLGATE.—And that it satisfactorily performed the work you wanted it to do ?

Mr. NANCE.—Yes, easy.

Mr. HOLGATE.—Who were your foremen ?

Mr. NANCE.—Our general foreman was Mr. Yenser. There was a foreman under him, Mr. Worley. Mr. Worley was generally on the work at all times with us.

Mr. HOLGATE.—Did you consider your foremen understood their work ?

Mr. NANCE.—Yes, sir, I believe they did.

Mr. HOLGATE.—You refer now to Mr. Worley and also to Mr. Yenser ?

Mr. NANCE.—Yes, I think both of them understood it and especially that work that they had been on two or three years; I think it could not have been better.

Mr. HOLGATE.—Although the work was, to a certain extent a hazardous work, you had confidence in your foremen ?

Mr. NANCE.—Yes, sir.

Mr. HOLGATE.—And in the tackle ?

Mr. NANCE.—Yes.

Mr. HOLGATE.—And in their methods of doing the work ?

Mr. NANCE.—Yes. I never saw as good methods of doing everything as I saw there.

Mr. HOLGATE.—I dare say, Mr. Nance, that you heard a good many statements since this accident happened in regard to certain defects that are said to have been observed ?

Mr. NANCE.—Oh, yes, lots of them.

Mr. HOLGATE.—Have any of the men that have observed these things spoken to you about them ?

Mr. NANCE.—Nobody but Mr. Cook, the time I told you about.

Mr. HOLGATE.—Since the accident has anybody ?

Mr. NANCE.—No, I do not think they have.

Mr. HOLGATE.—Do you know of any man who, you think, would be able to give us any information from his own knowledge ?

Mr. NANCE.—No, sir, I do not know of a man that could help you in that respect, because I guess it was a surprise to them as well as it was to me.

Mr. HOLGATE.—I do not refer so much to the accident itself but to the condition of the bridge prior to the accident.

Mr. NANCE.—I do not know of any man.

Mr. HOLGATE.—On the day of this accident you were on the forward traveller. Did you notice anything peculiar at all ?

Mr. NANCE.—No, sir, I did not.

Mr. HOLGATE.—Nothing peculiar in the action of the bridge different from any other day ?

Mr. NANCE.—No, sir, I could not see any difference at all.

Mr. HOLGATE.—No unusual vibration or springing action ?

Mr. NANCE.—No, sir.

Mr. HOLGATE.—It was just the same as it had been ?

Mr. NANCE.—It was just the same right up to the moment she went down.

Mr. HOLGATE.—Was there at any time any such motion felt by you ?

Mr. NANCE.—No, sir.

Witness discharged.

John E. SPLICER, sworn.

Mr. HOLGATE.—Are you an employee of the Phoenix Bridge Co., Mr. Splicer?

Mr. SPLICER.—Yes, sir.

Mr. HOLGATE.—When did you begin working at the Quebec Bridge with the Phoenix Bridge Company?

Mr. SPLICER.—I started last September, working.

Mr. HOLGATE.—September, 1907?

Mr. SPLICER.—1906.

Mr. HOLGATE.—Then you have been working there nearly a year?

Mr. SPLICER.—Yes, sir.

Mr. HOLGATE.—What part of the work were you on?

Mr. SPLICER.—Most of it, I guess.

Mr. HOLGATE.—You might tell us what you were doing from September, 1906?

Mr. SPLICER.—Well, I worked on the false work when I first went there, and afterwards I went into a riveting gang, and then I went on a raising gang, and then I went up on the traveller.

Mr. HOLGATE.—Which traveller?

Mr. SPLICER.—The big traveller.

Mr. HOLGATE.—On August 29, where were you working?

Mr. SPLICER.—I was not working at all.

Mr. HOLGATE.—What is the nearest date to August 29 you were working?

Mr. SPLICER.—The day before.

Mr. HOLGATE.—Then you worked on the 28th?

Mr. SPLICER.—The 28th.

Mr. HOLGATE.—On the 28th were you working on the big traveller?

Mr. SPLICER.—Yes, sir.

Mr. HOLGATE.—What were they doing with the big traveller?

Mr. SPLICER.—I was taking pins out of them sheaves up there, that is alongside the traveller there, taking the pins out, and one thing and another, taking the girders down, we were taking it down.

Mr. HOLGATE.—That is what has been described as taking down the big traveller?

Mr. SPLICER.—Taking down the big traveller.

Mr. HOLGATE.—What was the cause of your absence on the 29th?

Mr. SPLICER.—I do not know, I felt nervous, I guess.

Mr. HOLGATE.—Had you been constantly at work prior to that time?

Mr. SPLICER.—Yes, sir.

Mr. HOLGATE.—Had you felt nervous before?

Mr. SPLICER.—No, not till about a week before.

Mr. HOLGATE.—What was the cause of your nervousness?

Mr. SPLICER.—Well, I do not know, I do not know the cause of it at all, it just came into me that way.

Mr. HOLGATE.—And was that the cause of your taking a holiday on the 29th.

Mr. SPLICER.—Yes, sir.

Mr. HOLGATE.—Did you intend to go back to work?

Mr. SPLICER.—Yes, I intended to go back to work noon; I was lying off in the morning and intended to go back noon, but it got later.

Mr. HOLGATE.—You just laid off in the morning?

Mr. SPLICER.—Just laid off in the morning; I was going to Quebec, but I didn't go to work in the afternoon, it was too windy, and I went to Quebec in the afternoon.

Mr. HOLGATE.—What was the cause of your uneasiness or nervousness?

Mr. SPLICER.—It was the chord.

Mr. HOLGATE.—No, with regard to your lying off that morning?

Mr. SPLICER.—In the morning? I was talking about the chord the night before, the whole bunch of us.

Mr. HOLGATE.—Then you decided, though, to go to work in the afternoon?

SESSIONAL PAPER No. 154

Mr. SPICER.—Yes, sir, I decided.

Mr. HOLGATE.—And you did not go to work because the wind was blowing too hard?

Mr. SPLICER.—The wind was blowing too hard.

Mr. HOLGATE.—Was it an unusual wind?

Mr. SPICER.—No, we generally get that every now and then. Of course I had been working up on the traveller on windy days, it is not very comfortable.

Mr. HOLGATE.—The real reason then for your not returning to work was the wind?

Mr. SPICER.—The wind, yes, sir.

Mr. HOLGATE.—And not anything else?

Mr. SPLICER.—No, sir.

Mr. HOLGATE.—And your cause for the nervousness in lying off for wind that morning was the chord, you say?

Mr. SPLICER.—Yes, sir.

Mr. HOLGATE.—You might explain just what you mean?

Mr. SPLICER.—The bent chord there; we were talking about it the night before.

Mr. HOLGATE.—Who?

Mr. SPLICER.—About seven or eight of us, they were all Indians working down there.

Mr. HOLGATE.—Who are these men, do you remember?

Mr. SPLICER.—There was Solomon Angus, Joe Mitchell, Mitchell Adams, and four of them, there is John Jocko, and they all boarded in the same place, Joseph Dion, Lewis Dibeau.

Mr. HOLGATE.—Are any of these men living?

Mr. SPLICER.—No, sir, none of them.

Mr. HOLGATE.—What list is that you are referring to?

Mr. SPLICER.—Only the names of the Indian boys, that is all.

Mr. HOLGATE.—When was that made?

Mr. SPLICER.—I made that out myself, just the boys that were killed, all the Indian boys.

Mr. HOLGATE.—And none of these men are available? Do you know if any of these men saw what they spoke to you about?

Mr. SPLICER.—The way they talked that night, they said they did. They said there was a place in that chord, I do not know whereabouts, where it was bent, and they were trying to jack it together, and they could not jack the plates together and riveted it up the way it was, that is the way they were saying the night before. My mother heard them, too.

Mr. HOLGATE.—When did this conversation take place?

Mr. SPLICER.—The 28th, the night before the accident.

Mr. HOLGATE.—Did you see this chord yourself?

Mr. SPLICER.—No, I did not go down at the chord, I worked out on the side, and just had a glance at it, that is all.

Mr. HOLGATE.—Was that on the evening of the 28th?

Mr. SPLICER.—No, it was on Tuesday I had a glance at it.

Mr. HOLGATE.—That is before you had this conversation?

Mr. SPLICER.—Oh, yes, that is before we had this conversation.

Mr. HOLGATE.—What took you there?

Mr. SPLICER.—Well, they were talking about it.

Mr. HOLGATE.—They talked about it before the 28th; who was with you at that time?

Mr. SPLICER.—Who was with me, I do not know his name; he showed me it. Do you know him, Haley, that Nova Scotia fellow, the fellow from Nova Scotia?

Mr. HALEY.—Jim Rowen.

7-8 EDWARD VII., A. 1908

Mr. SPLICER.—Jim Bowen.

Mr. HOLGATE.—Is he living?

Mr. SPLICER.—Yes, sir.

Mr. HOLGATE.—Do you know where he is now?

Mr. SPLICER.—He has gone home, I understand, back to New Brunswick.

Mr. HOLGATE.—What did you see?

Mr. SPLICER.—I just saw the bend, that is all, just a glance at it.

Mr. HOLGATE.—Just the——

Mr. SPLICER.—Chord bent, that is all.

Mr. HOLGATE.—Do you remember what chord it was?

Mr. SPLICER.—No, sir, it was on this side of the pier, that is all I know.

Mr. HOLGATE.—That is on the river side of the pier?

Mr. SPLICER.—On this side, towards the north side there.

Mr. HOLGATE.—It was north of the cantilever pier?

Mr. SPLICER.—The cantilever arm.

Mr. HOLGATE.—It was in the cantilever arm?

Mr. SPLICER.—Yes.

Mr. HOLGATE.—On the Quebec or Montreal side?

Mr. SPLICER.—The Quebec side.

Mr. HOLGATE.—How many panels did it out from the pier?

Mr. SPLICER.—I could not say, but four, I think.

Mr. HOLGATE.—What do you remember about the chord itself?

Mr. SPLICER.—Nothing at all, that is all I know, I just had a glance at it and went by. I was talking about it on my way to——

Mr. HOLGATE.—Did you call the attention of any other person to that?

Mr. SPLICER.—No, sir.

Mr. HOLGATE.—If you had considered it of sufficient importance, you would have called the attention of your foreman to it, or some person.

Mr. SPLICER.—Well, I thought it was safe myself. I do not know much about that iron. I thought it was safe, it never bothered me any.

Mr. HOLGATE.—So far as your judgment went then there was nothing that you saw that caused you alarm?

Mr. SPLICER.—No, sir.

Mr. HOLGATE.—Had you a feeling of confidence or otherwise in the foremen who were over you in this bridge erection; did you think that they were competent men?

Mr. SPLICER.—Yes, sir, good men.

Mr. HOLGATE.—To whom do you refer now?

Mr. SPLICER.—All of them, I should think; I found them all good men.

Mr. HOLGATE.—And with regard to the appliances that were used in the handling were they safe?

Mr. SPLICER.—Yes, sir.

Mr. HOLGATE.—Do you recollect any occasion where failure took place in the tackle in the handling of the material?

Mr. SPLICER.—No, sir.

Mr. HOLGATE.—Not any occasion during the year that you were there?

Mr. SPLICER.—No, sir.

Mr. HOLGATE.—Did you observe at any time any unusual vibration, either sideways or up and down?

Mr. SPLICER.—No, sir.

Mr. HOLGATE.—And you say that on several occasions you have had high winds?

Mr. SPLICER.—Yes, sir.

Mr. HOLGATE.—Had you any feeling of insecurity?

Mr. SPLICER.—No, sir.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—And even after you learned all of the conditions that were described with regard to the chord, you thought it was safe?

Mr. SPLICER.—I thought it was safe, sir.

Witness discharged.

PERCY WILSON, sworn.

Mr. HOLGATE.—Are you an employee of the Phoenix Bridge Company?

Mr. WILSON.—Yes, sir.

Mr. HOLGATE.—How long have you been with them.

Mr. WILSON.—This is the second summer.

Mr. HOLGATE.—Where were you engaged at work?

Mr. WILSON.—In the storage yard. This last four weeks I was on the bridge.

Mr. HOLGATE.—In the storage yard up to four weeks ago?

Mr. WILSON.—Three or four weeks, I am not sure.

Mr. HOLGATE.—That is you were working on the bridge three or four weeks?

Mr. WILSON.—Yes, sir.

Mr. HOLGATE.—In what capacity were you working in the storage yard?

Mr. WILSON.—Oh, just as a common labourer.

Mr. HOLGATE.—Who was your foreman?

Mr. WILSON.—A man by the name of Clark.

Mr. HOLGATE.—Then when you went on the bridge what were your duties?

Mr. WILSON.—I was just serving the riveters.

Mr. HOLGATE.—All the time?

Mr. WILSON.—Yes, sir.

Mr. HOLGATE.—Who was your foreman there?

Mr. WILSON.—It was a tall man by the name of Slim. I guess his name was Meredith, I am not sure.

Mr. HOLGATE.—Did Meredith survive the accident of the 29th?

Mr. WILSON.—Yes, sir, he was working on the 29th.

Mr. HOLGATE.—Did he survive that accident?

Mr. WILSON.—No, sir, he is gone.

Mr. HOLGATE.—Where were you working on the 29th August?

Mr. WILSON.—On the bridge, sir.

Mr. HOLGATE.—At what point?

Mr. WILSON.—When the bridge went I was just going ashore for rivets, and I turned around, I saw the bridge going.

Mr. HOLGATE.—What part of the bridge were you on?

Mr. WILSON.—On the span that is left, the shore span.

Mr. HOLGATE.—You were on the bridge?

Mr. WILSON.—No, sir, I was not on the part that went.

Mr. HOLGATE.—Did you see Huot?

Mr. WILSON.—Yes, sir.

Mr. HOLGATE.—Where was he?

Mr. WILSON.—We ran away, the three of us, Ouimet—

Mr. HOLGATE.—Huot and yourself and Ouimet ran off together?

Mr. WILSON.—Yes, sir.

Mr. HOLGATE.—Just prior to that where had you come from on the bridge?

Mr. WILSON.—I was just coming from outside the anchor pier.

Mr. HOLGATE.—Where was the riveting gang working at this time?

Mr. WILSON.—Oh, there were about eight gangs of riveters then; they were working all along.

Mr. HOLGATE.—Were you serving one gang or more?

Mr. WILSON.—One.

Mr. HOLGATE.—Where was it working at the time of the accident?

Mr. WILSON.—About 300 feet outside the pier.

Prof. GALBRAITH.—The anchor pier?

Mr. WILSON.—Yes, sir.

Mr. HOLGATE.—Which side of the bridge, the Quebec or Montreal side.

Mr. WILSON.—The Montreal side.

Mr. HOLGATE.—Do you remember what part of the structure they were working on?

Mr. WILSON.—All on the bottom chord.

Prof. GALBRAITH.—Was that the fifth or sixth span?

Mr. WILSON.—I could not say exactly, but it was about 300 feet outside the pier.

Prof. GALBRAITH.—How do you count the 300 feet, how do you estimate it, by the number of chords or how?

Mr. WILSON.—No sir, I could not say what number of chords they were out.

Prof. GALBRAITH.—You do not know whether it was the fifth or sixth chord or the ninth.

Mr. WILSON.—No, sir, I do not; it was the distance outside the pier.

Prof. GALBRAITH.—It was not the ninth chord?

Mr. WILSON.—No, sir.

Prof. GALBRAITH.—Are you sure it was not?

Mr. WILSON.—Well, the ninth chord they were talking about was inside the pier, I guess.

Prof. GALBRAITH.—Inside the centre pier?

Mr. WILSON.—Yes, sir.

Prof. GALBRAITH.—You were on the anchor arm inside the centre pier?

Mr. WILSON.—No, it is about 300 feet outside the pier.

Prof. GALBRAITH.—Outside the main pier?

Mr. WILSON.—Yes, sir.

Mr. HOLGATE.—On the cantilever arm?

Mr. WILSON.—Outside.

Mr. HOLGATE.—You were serving the men with rivets; were you serving the riveters with the hot rivets?

Mr. WILSON.—No, sir.

Mr. HOLGATE.—Then were you distributing the cold rivets amongst the various riveting gangs, is that it?

Mr. WILSON.—That is it.

Mr. HOLGATE.—Who were in the gang that Meredith was handling?

Mr. WILSON.—Well, he handled the whole of them.

Mr. HOLGATE.—He handled all the gangs?

Mr. WILSON.—Yes, sir.

Mr. HOLGATE.—Where were the other riveting gangs located that day?

Mr. WILSON.—There was a gang on the pier.

Mr. HOLGATE.—On the cantilever pier?

Mr. WILSON.—Yes, sir, and two gangs inside the pier and the rest were outside the pier.

Mr. HOLGATE.—Two gangs inside the pier towards the—

Mr. WILSON.—The shore, one on each side.

Mr. HOLGATE.—One on each side of the bridge?

Mr. WILSON.—Of the bridge.

Mr. HOLGATE.—And where were the others?

Mr. WILSON.—Outside the pier.

Mr. HOLGATE.—That made how many gangs altogether?

Mr. WILSON.—There were some riveting that morning, I think there were seven or eight, there were generally nine.

Mr. HOLGATE.—One was on the pier, two were on the land side of the pier and the other gangs on the cantilever arm.

Mr. WILSON.—Yes, sir, outside the bridge.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—Now, we will begin with those working on the anchor arm; you say there two gangs there, one on each side?

Mr. WILSON.—One on each side.

Mr. HOLGATE.—Do you know at what joint they were working?

Mr. WILSON.—No, sir.

Mr. HOLGATE.—Can you locate them in any way?

Mr. WILSON.—I do not think so.

Mr. HOLGATE.—Were they working on floor beams or chords?

Mr. WILSON.—On chords, both of them on chords.

Mr. HOLGATE.—They were both working on chords but you do not know which chord?

Mr. WILSON.—I could not say, sir.

Mr. HOLGATE.—Then the gang that was working on the pier, what were they doing?

Mr. WILSON.—Well, they seemed to me to be riveting the shoe on the pier.

Mr. HOLGATE.—On which side of the bridge, the Montreal or Quebec side?

Mr. WILSON.—The Quebec side.

Mr. HOLGATE.—Can you locate the gangs on the cantilever arm?

Mr. WILSON.—No, sir, I could not.

Mr. HOLGATE.—Were there others doing the same kind of work as you?

Mr. WILSON.—There were two that afternoon.

Mr. HOLGATE.—Two distributing rivets to all these gangs?

Mr. WILSON.—Yes, sir.

Mr. HOLGATE.—Who was the other?

Mr. WILSON.—He worked only the day before, three days he was there, I do not know who he was; he said he came from Montreal, two of them came together.

Mr. HOLGATE.—Where is he now?

Mr. WILSON.—He is down, he is dead, I did not see him; he was a Canadian.

Mr. HOLGATE.—You say there were three, was there another one?

Mr. WILSON.—Well, he was serving the rivets in the forenoon and he put him painting in the afternoon.

Mr. HOLGATE.—Where is he now?

Mr. WILSON.—He is dead, too.

Mr. HOLGATE.—Now, these riveting gangs working on the cantilever arm, were they working on the floor beams, riveting?

Mr. WILSON.—They were working on the bottom chords.

Mr. HOLGATE.—Were they all working on bottom chord work?

Mr. WILSON.—Only those two inside the piers, and then there was a gang on the pier.

Mr. HOLGATE.—I was referring to those on the cantilever arm?

Mr. WILSON.—Yes, sir.

Mr. HOLGATE.—They were working where?

Mr. WILSON.—On the bottom chord.

Mr. HOLGATE.—All on bottom chord work?

Mr. WILSON.—Yes, sir.

Mr. HOLGATE.—Do you remember who they were in that gang that was working on the pier?

Mr. WILSON.—No, sir, they were Indians.

Mr. HOLGATE.—Do you know if any of them are now alive?

Mr. WILSON.—I do not think so.

Mr. HOLGATE.—Which way were you going when the accident happened to the bridge?

Mr. WILSON.—I was going ashore, toward the shore.

Mr. HOLGATE.—And you were, I think you said, on the approach span?

Mr. WILSON.—Yes, sir.

7-8 EDWARD VII., A. 1908

Mr. HOLGATE.—What did you first notice?

Mr. WILSON.—Well, I heard a noise and I turned around and I saw it going from the pier like a flash of lightning.

Mr. HOLGATE.—Which pier?

Mr. WILSON.—From the far pier, I mean the pier that is in the cantilever arm.

Mr. HOLGATE.—Just in your own words tell us what you noticed at that time?

Mr. WILSON.—All I noticed was when I turned around and seen the bridge going. It took about five or six seconds and then all I seen was floating timber on the river and a mass of steel was between the two piers.

Mr. HOLGATE.—What did you do after that?

Mr. WILSON.—I turned around and ran down below a stairs there, the steps. I had a brother working on the traveller, and I had another brother working under the bridge, and I thought I would see him down below, and when I got down there I did not see him; they were gone, both of them.

Mr. HOLGATE.—When you were going backwards and forwards on the bridge, serving the gangs with rivets for about a month did you observe anything out of order or was your attention called to anything apparently out of order?

Mr. WILSON.—No, sir, I never did.

Mr. HOLGATE.—Did anybody ever speak to you?

Mr. WILSON.—Yes, I heard lots about it but I never minded them, I thought it would never—

Mr. HOLGATE.—Do you remember what that information was?

Mr. WILSON.—I heard them speaking about a cracked bottom chord, I never seen it myself.

Mr. HOLGATE.—Was that what they said, a cracked bottom chord?

Mr. WILSON.—Yes, sir.

Mr. HOLGATE.—Do you remember who said that to you?

Mr. WILSON.—Well, my brother often spoke of it.

Mr. HOLGATE.—Was there anybody else?

Mr. WILSON.—Oh, yes.

Mr. HOLGATE.—Is there anybody that is living now that you heard use that expression?

Mr. WILSON.—Yes, there was a young painter by the name of Donat Nadeau.

Mr. HOLGATE.—Was he lost?

Mr. WILSON.—No, sir.

Mr. HOLGATE.—Where is he?

Mr. WILSON.—At St. Romuald.

Mr. HOLGATE.—Did he give you any description of it?

Mr. WILSON.—No, sir, he did not.

Mr. HOLGATE.—Do you remember when he told you about it?

Mr. WILSON.—Yes, sir.

Mr. HOLGATE.—When?

Mr. WILSON.—Oh, it was the day before, he spoke to me about it.

Mr. HOLGATE.—The day before—

Mr. WILSON.—The accident.

Mr. HOLGATE.—Did he give you to understand he had seen it?

Mr. WILSON.—No, I forget if he did say if he had seen it or not, but I know they spoke about it.

Mr. HOLGATE.—You did not see it?

Mr. WILSON.—No, sir.

Mr. HOLGATE.—Do you remember if Nadeau specified which chord he referred to?

Mr. WILSON.—No, sir, he said it was near the pier, near the caisson.

Mr. DAVIDSON.—Did he tell you what was the matter?

Mr. WILSON.—He said it was cracked.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—Did you understand from what he said whether it was on the cantilever or the anchor arm?

Mr. WILSON.—I think it was on the cantilever arm, I did not pay much attention to it, because I did not believe it.

Witness discharged.

AIME GINGRAS, sworn. (Testimony given in French).

Prof. GALBRAITH.—You are employed by the Phoenix Bridge Company?

Mr. GINGRAS.—Yes, sir.

Prof. GALBRAITH.—Were you working the day of the accident?

Mr. GINGRAS.—Yes, sir.

Prof. GALBRAITH.—What had you to do there?

Mr. GINGRAS.—I was carrying water to the office.

Prof. GALBRAITH.—Where were you at the time of the accident?

Mr. GINGRAS.—I was right near the office.

Prof. GALBRAITH.—What did you see?

Mr. GINGRAS.—I saw the bridge fall.

Prof. GALBRAITH.—Will you describe its appearance as it fell?

Mr. GINGRAS.—I know nothing about that; it fell with a crash.

Prof. GALBRAITH.—Did you watch it during the whole time of the fall?

Mr. GINGRAS.—No.

Prof. GALBRAITH.—If your duties did you go daily from one part of the bridge to the other?

Mr. GINGRAS.—Yes, going messages.

Prof. GALBRAITH.—Did you ever hear anything said about the bridge being dangerous.

Mr. GINGRAS.—I had heard that the bridge was going to fall.

Prof. GALBRAITH.—Do you know the names of the men who told you that?

Mr. GINGRAS.—No, I do not know them.

Prof. GALBRAITH.—Do you know the men even although you do not know their names?

Mr. GINGRAS.—I do not think I know them.

Prof. GALBRAITH.—How long have you been working on the bridge?

Mr. GINGRAS.—Two years.

Prof. GALBRAITH.—And yet you would not recognize any man who spoke about the bridge being dangerous?

Mr. GINGRAS.—I do not know that at all.

Prof. GALBRAITH.—Not by sight?

Mr. GINGRAS.—I did not look at them for any length of time, I just was passing near them when they said that.

Prof. GALBRAITH.—When did you hear that?

Mr. GINGRAS.—The morning of the accident, I thought they were only joking.

Prof. GALBRAITH.—Was anything on the bridge pointed out to you as being dangerous?

Mr. GINGRAS.—No.

Prof. GALBRAITH.—Did you see anything yourself?

Mr. GINGRAS.—No.

Witness discharged.

The Commission took recess.

7-8 EDWARD VII., A. 1908

AFTERNOON SESSION—SEVENTH DAY.

Commission resumed at two o'clock.

RAOUL LAFRANCE, sworn.

Mr. HOLGATE.—Were you an employee of the Phoenix Bridge Company?

Mr. LAFRANCE.—Yes, sir.

Mr. HOLGATE.—When did you enter their employment?

Mr. LAFRANCE.—At the beginning of July.

Mr. HOLGATE.—Were you employed with them constantly?

Mr. LAFRANCE.—I had left off work for about ten days before the bridge fell. I, as a rule, worked with the electrician, Mr. Britton.

Mr. HOLGATE.—What else did you do?

Mr. LAFRANCE.—I carried rivets, and painting, and all kinds of work.

Mr. HOLGATE.—Who was your foreman?

Mr. LAFRANCE.—I do not remember his name. They used to call him Benny.

Mr. HOLGATE.—How long were you painting?

Mr. LAFRANCE.—I did not work the whole time at the painting. I painted only when I had nothing else to do.

Mr. HOLGATE.—Who was your foreman when you were painting?

Mr. LAFRANCE.—My cousin, who was the head of the gang—Alexandre Ouimet.

Mr. HOLGATE.—Is he here?

Mr. LAFRANCE.—No, he is gone.

Mr. HOLGATE.—Where?

Mr. LAFRANCE.—I do not know where he has gone to. He has left for Ontario.

Mr. HOLGATE.—When did he leave?

Mr. LAFRANCE.—Saturday afternoon.

Mr. HOLGATE.—Did he tell you where he was going?

Mr. LAFRANCE.—I do not know. I know he took the C. P. R. train and left for Ontario. He has gone to the shanties there. He gave me the name of the place, but I do not remember.

Mr. HOLGATE.—Who knows?

Mr. LAFRANCE.—I do not know.

Mr. HOLGATE.—And you do not know where he is to be found now?

Mr. LAFRANCE.—No.

Mr. HOLGATE.—Did your work carry you about the different parts of the bridge?

Mr. LAFRANCE.—Yes, I went everywhere—it was immaterial to me—anywhere at all,—I was ready to go.

Mr. HOLGATE.—In going about the bridge, did you notice anything at all out of the ordinary?

Mr. LAFRANCE.—The only thing I noticed was a crack on the pile.

Mr. HOLGATE.—Was that a crack in the pier?

Mr. LAFRANCE.—No, it was above the shoe on the plate.

Mr. HOLGATE.—How wide was that crack?

Mr. LAFRANCE.—About 18 or 20 inches long.

Mr. HOLGATE.—How wide was the crack?

Mr. LAFRANCE.—It was open about as thick as a little finger.

Mr. HOLGATE.—Did you examine the crack yourself?

Mr. LAFRANCE.—Yes, I looked at it. I did not go up on top to look at it though I saw it.

Mr. HOLGATE.—Where were you when you saw it?

Mr. LAFRANCE.—On the pier. I was cleaning the pier. My cousin, Mr. Ouimet, drew my attention to it.

Mr. HOLGATE.—How far would that be that you were from the crack when you noticed it?

SESSICNAL PAPER No. 154

Mr. LAFRANCE.—Between 6 and 8 feet from it. I was cleaning the pier and Ouimet brought me to look at it.

Mr. HOLGATE.—Did you see it more than once?

Mr. LAFRANCE.—I looked at it three or four days.

Mr. HOLGATE.—The same day?

Mr. LAFRANCE.—I was three days on the pier and I looked at it every day. I was cleaning the pier, gathering the bolts and everything that was there.

Mr. HOLGATE.—Did that crack go out to the edge of the plate?

Mr. LAFRANCE.—No.

Mr. HOLGATE.—Did it go down as if it were torn from the edge of the plate?

Mr. LAFRANCE.—The plate was square, and—

Mr. HOLGATE.—There is a piece of paper (handing witness a sheet of white paper) just tear it the way you say the crack. (Witness tore the paper.) Was it in that position, upright?

Mr. LAFRANCE.—The crack was on the lower part of the Quebec side of a pier on the Montreal side.

Mr. HOLGATE.—Then the crack did extend out to the edge of the plate?

Mr. LAFRANCE.—It did not extend as far as the middle, but it was about 18 or 20 inches in length. The plate was 6 or 8 feet square. That is what it seemed to me.

Mr. HOLGATE.—You were three days on the pier, so that probably you had the whole matter very clearly in your head?

Mr. LAFRANCE.—Yes.

Mr. HOLGATE.—And you probably would recognize a photograph of that place?

Mr. LAFRANCE.—Yes.

Mr. HOLGATE.—Look at this photograph and tell us if that shows that plate? (Witness was shown a photograph.)

Mr. LAFRANCE.—Is that a photograph of the pier on the Montreal side or the Quebec side?

Mr. HOLGATE.—They are both alike, I understand.

Mr. LAFRANCE.—The plate was on the other side.

Mr. STUART.—There is one there shown which corresponds, I think.

Mr. HOLGATE.—The two sides are exactly alike.

Mr. LAFRANCE.—To give you the directions it would be better if I had the pier on the Montreal side.

Mr. HOLGATE.—This is not the identical plate shown in the photograph but is the plate on the Quebec side corresponding with the one on the Montreal side which you have been describing.

Mr. LAFRANCE.—The plate the crack was in cannot be seen on that photograph. It was on the inside of that.

Mr. HOLGATE.—Was the plate lying flat?

Mr. LAFRANCE.—No, vertical.

Mr. HOLGATE.—This photograph shows the whole arrangement at the shoe?

Mr. LAFRANCE.—Yes. (Photograph put in and marked Exhibit No. 29.)

Mr. HOLGATE.—Is that plate marked X on exhibit No. 29, the plate you mean?

Mr. LAFRANCE.—No, it is a plate that was above that one and at the back of it on the Montreal side.

Mr. STUART.—Does he say the crack is on the Montreal side?

Mr. LAFRANCE.—On the Quebec side of a Montreal side plate.

Mr. HOLGATE.—Did you notice particularly the plate marked X?

Mr. LAFRANCE.—Yes.

Mr. HOLGATE.—Do you remember that plate?

Mr. LAFRANCE.—Yes.

Mr. HOLGATE.—Was that plate cracked? *

Mr. LAFRANCE.—No. If there was any crack I did not see it, and I was cleaning that plate.

7-8 EDWARD VII., A. 1908

Mr. DAVIDSON.—Of course, I have no doubt the commissioners recognize how difficult it is for any one, much less a boy like this, to recognize from a photograph—I know it would be extremely difficult for me, entirely unacquainted with bridge work and structures like that—the exact point that was referred to.

Mr. HOLGATE.—He has recognized this particular plate and he is positive there was no crack in it.

Mr. DAVIDSON.—That is not a photograph of the plate he saw at all.

Mr. HOLGATE.—But he says he cleaned this plate and there is no crack in it.

Prof. GALBRAITH.—Is it the corresponding plate on the other side?

Mr. LAFRANCE.—I worked on and cleaned every one of them.

Mr. DAVIDSON.—Ask him what he means when he says: 'La plaque en question etait dans cette position.' Does he mean straight up and down or slanting?

Mr. LAFRANCE.—Slightly inclined.

Mr. DAVIDSON.—Do you see in that photograph the plate in which you saw the crack?

Mr. LAFRANCE.—No.

Mr. HOLGATE.—Do you know the part of the bridge called the shoe?

Mr. LAFRANCE.—Yes, that is the lower part that was on the pier.

Mr. DAVIDSON.—Is that right, Mr. Kinloch?

Mr. KINLOCH.—No.

Mr. LAFRANCE.—I do not know much about it.

Mr. DAVIDSON.—When you stood on the pier looking at the plate was it above your head or in front of you?

Mr. LAFRANCE.—It was above my head.

Mr. HOLGATE.—Was there anything above your head? You were standing on the pier?

Mr. LAFRANCE.—I was standing on the pier.

Mr. HOLGATE.—Naturally, it would be above his head.

(NOTE.—Witness was shown the photograph reversed against the light in order to bring the corresponding parts shown as appearing on the Quebec side and was then enabled to identify the plate that he refers to by an ink mark on the back of the photograph.)

Mr. HOLGATE.—The mark that appears on the back of this photograph, exhibit No. 29, then, is your own mark identifying the plate you refer to?

Mr. LAFRANCE.—Yes, that is what I saw.

Mr. HOLGATE.—You think you would recognize that plate again?

Mr. LAFRANCE.—Yes, sir.

Mr. HOLGATE.—What was the last time that you observed this plate?

Mr. LAFRANCE.—About two or three weeks before the accident.

Mr. HOLGATE.—How many times since that time did you see it?

Mr. LAFRANCE.—I looked at it three or four times.

Mr. HOLGATE.—What was the last time you saw it?

Mr. LAFRANCE.—I do not exactly remember—about two or three weeks before the accident.

Mr. HOLGATE.—Did you notice anything else in connection with the bridge that was out of order?

Mr. LAFRANCE.—No.

Mr. HOLGATE.—We want you—we order you to go on the ground to-morrow, and in company with Mr. Kinloch and Mr. McLure, endeavour to find that plate.

Mr. LAFRANCE.—Yes.

Mr. HOLGATE.—We want you to stay until you find that plate or make sure of something and appear here on Friday morning and resume your evidence.

Mr. LAFRANCE.—Yes.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—You are still under subpoena and it is compulsory for you to be here.

Mr. LAFRANCE.—Yes.

Witness retired.

DONAT NADEAU, sworn.

Prof. KERRY.—Have you been working for the Phoenix Bridge Company?

Mr. NADEAU.—Yes, sir.

Prof. KERRY.—For how long?

Mr. NADEAU.—About a month.

Prof. KERRY.—In what position?

Mr. NADEAU.—As a painter.

Prof. KERRY.—At what part of the bridge?

Mr. NADEAU.—At every part of the bridge where there was painting to be done.

Prof. KERRY.—Were you working on the 29th August?

Mr. NADEAU.—I worked till a quarter to three in the afternoon.

Prof. KERRY.—Why did you stop?

Mr. NADEAU.—On account of wind.

Prof. KERRY.—Were you there when the bridge fell?

Mr. NADEAU.—No, I was down home.

Prof. KERRY.—Did you see any part of the bridge out of order?

Mr. NADEAU.—No.

Prof. KERRY.—It was all safe and sound?

Mr. NADEAU.—I never noticed anything wrong or broken.

Prof. KERRY.—Did you hear anyone say that anything was wrong?

Mr. NADEAU.—Yes.

Prof. KERRY.—Who told you?

Mr. NADEAU.—Some of my work mates—the fellows working with me.

Prof. KERRY.—You do not know who?

Mr. NADEAU.—Yes, Joe Biron.

Prof. KERRY.—And the others?

Mr. NADEAU.—I do not remember any others who spoke to me about it.

Prof. KERRY.—Is Joe Biron alive?

Mr. NADEAU.—No, he was killed.

Prof. KERRY.—What did he say?

Mr. NADEAU.—The night before the day that the bridge fell I, Joe Biron and others working on the bridge were talking about the bridge and they agreed that there was something wrong.

Mr. STUART.—That is not what he said, is it?

Mr. NADEAU.—They were speaking about the work concerning the bridge and Biron said there was something broken in the bridge—a plate cracked.

Prof. KERRY.—In what place?

Mr. NADEAU.—Biron said that it was near the pier.

Prof. KERRY.—You do not know the exact place?

Mr. NADEAU.—No.

Prof. KERRY.—Was it on the pier or on one of the chords?

Mr. NADEAU.—I could not say.

Prof. KERRY.—You have never seen anything yourself?

Mr. NADEAU.—No, never.

Prof. KERRY.—Do you know that Biron saw it?

Mr. NADEAU.—I could not say.

Mr. HOLGATE.—Do you know anything of your own knowledge?

Mr. NADEAU.—No.

7-8 EDWARD VII., A. 1908

Prof. GALBRAITH.—You said that you did not work after three o'clock on account of the wind?

Mr. NADEAU.—Yes.

Prof. GALBRAITH.—Was there more wind than usual that afternoon?

Mr. NADEAU.—No.

Prof. GALBRAITH.—You had often worked on the bridge when the wind was as strong?

Mr. NADEAU.—Yes.

Witness discharged.

Mr. A. B. MILLIKEN, recalled.

Prof. KERRY.—You had full charge of the erection of the bridge?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—What was the last date that you were at the structure previous to its fall?

Mr. MILLIKEN.—The morning of August 26th.

Prof. KERRY.—That would be the Tuesday of the week?

Mr. MILLIKEN.—Monday.

Prof. KERRY.—The bridge fell on Thursday?

Mr. MILLIKEN.—It fell on Thursday the 29th.

Prof. KERRY.—For how many days at that time had you been in the vicinity of the structure?

Mr. MILLIKEN.—From August 6th to August 26th.

Prof. KERRY.—You were there continuously between those dates?

Mr. MILLIKEN.—Yes, sir; that is I had been out to Belair.

Prof. KERRY.—But you were at Quebec?

Mr. MILLIKEN.—In the vicinity of the work.

Prof. KERRY.—In touch with the work?

Mr. MILLIKEN.—Yes.

Prof. KERRY.—Will you tell us what definite information you have about defects?

Mr. MILLIKEN.—I have not any definite information about defects.

Prof. KERRY.—Were no reports of those bulges brought to you at all?

Mr. MILLIKEN.—Yes, sir; I left for Phoenixville on the morning of August 26, I reached Phoenixville on the evening of August 28, and on the morning of Aug. 29, after I had gone down to the office at Phoenixville, there was a letter there from Mr. Yenser dated August 27, from Liverpool at the bridge. In that letter he indicated that a chord section was slightly bent and wanted to know whether he should continue to work on the suspended span or simply work on the removal of the main traveller and asked a reply from our office by wire. He was called up on long distance telephone, and I talked with him about a quarter of ten on the morning of August 29, and referring to his letter of August 27 I asked him whether he had stopped the erection or whether he was proceeding with it. His reply to me over 'phone was that he was going ahead and that everything was all right. I said: Have you moved the forward traveller? He said: Yes, moved it yesterday morning. And he further said that he had one of the temporary track girder spans in place and was about to swing the second one into place. I said: Is Mr. Birks there? He said: Yes. I said: Mr. Deans wants to speak to him. That was about all that was said between Mr. Yenser and myself. Then Mr. Deans talked with Mr. Birks following my conversation with Mr. Yenser.

Prof. KERRY.—That is to say that Mr. Yenser wrote drawing the attention of the office on the 27th and asking for specific instructions?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—And then proceeded to advance the traveller without waiting for a reply to that letter?

SESSIONAL PAPER No. 154

Mr. MILLIKEN.—Yes, sir. He asked a reply by wire, and instead of wiring we called him by 'phone, long distance 'phone.

Prof. KERRY.—At what time would it have been reasonable for him to have had a reply by wire to that letter ?

Mr. MILLIKEN.—At that time there was considerable trouble in transmission of telegrams. It was very uncertain, in fact they accepted all telegrams subject to delay on account of having trouble with the operators.

Prof. KERRY.—The letter would have reached Phoenixville at what time ?

Mr. MILLIKEN.—I think the letter reached Phoenixville about 9.15 in the morning. That is the usual time for our Quebec mail to reach Phoenixville, on the second delivery in the morning.

Prof. KERRY.—It takes about 36 hours for mail to be delivered ?

Mr. MILLIKEN.—Yes, sir, a letter mailed here—we have all our mail posted in the evening, coming down from work; that mail will reach Phoenixville or should day after to-morrow morning on the second delivery about 9 o'clock or 9.15 o'clock.

Prof. KERRY.—So that Mr. Yenser wrote a letter asking for specific instructions and then proceeded without waiting for a reply 24 hours before he could have reasonably expected in any case to have got a reply ?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—Did he indicate to you in your conversation that he took that step on the advice of anyone ?

Mr. MILLIKEN.—No, sir, he said that he considered everything all right and was going ahead and I then asked him these questions, where the forward traveller was, and he said he moved it yesterday morning and then he followed in saying that he had the first temporary track girder span placed and was about to place the second span of temporary track girders.

Prof. KERRY.—But he did not indicate that he had discussed the matter with anyone in the interval ?

Mr. MILLIKEN.—I do not know whether he had; it was reasonably certain he had discussed it with Mr. Birks, particularly with Mr. Birks he might have discussed it with.

Prof. KERRY.—You have no information ?

Mr. MILLIKEN.—No, sir.

Prof. KERRY.—One way or the other on that point ?

Mr. MILLIKEN.—No, sir.

Prof. KERRY.—Then he proceeded without getting instructions practically, even after the telephone conversation with you ?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—In that conversation he indicated to you that he no longer required instructions on the point he had written about ?

Mr. MILLIKEN.—He said everything was all right and he was going ahead.

Prof. KERRY.—Previous to that date of your leaving Quebec, your attention had not been drawn to those chords in any way ?

Mr. MILLIKEN.—Not a single time; no, sir.

Prof. KERRY.—Nor to any other structural defect ?

Mr. MILLIKEN.—No, sir, not by anyone. I usually saw Mr. Yenser and all of his assistants, as many of the other bridge men as I came in contact—when I left. I did that morning, the morning of August 26. I left in my usual way and there was not a word indicating that there was even a suspicion of anything being wrong with any part of the bridge or material.

Prof. KERRY.—Now, we had some evidence to the effect that the ribs of the different chords would be found not to line up correctly when the bottom cover plate was removed. Was that an unusual occurrence ?

Mr. MILLIKEN.—Nothing at all unusual. It has been often done. Where the ribs of a chord join, the surfaces were not exactly one with the other, and they

would either be wedged into their proper position or jacks would be used to push them in.

Prof. KERRY.—But it was a more or less frequent occurrence to find that when the joint was uncovered?

Mr. MILLIKEN.—Yes, sir, in placing the chords it often occurs that one chord does not come in perfect contact with the edges, you know, and then they will be put in position afterwards, and especially with such heavy members.

Prof. KERRY.—You mean that is customary practice outside the Quebec construction?

Mr. MILLIKEN.—Yes, sir, we have that often.

Prof. KERRY.—Would it be possible to erect those members without that procedure?

Mr. MILLIKEN.—I do not think it would, especially in the Quebec chords, where they are on such an inclination. When you lay them on the camber blocking, and if the camber blocking was not true to the chord in placing it, it might shift slightly, a very little bit, and that would throw it out of square with its adjoining section.

Prof. KERRY.—Would not the bolting up of the bottom cover plate bring that almost correct?

Mr. MILLIKEN.—It might and it might not.

Prof. KERRY.—If you got full sized bolts in it would.

Mr. MILLIKEN.—Full sized bolts, the full size of the hole might do it.

Prof. KERRY.—How soon after the placing of the chord were these members usually straightened up?

Mr. MILLIKEN.—Well, the chords of this bridge they were placed according to the diagram furnished by our engineers at Phoenixville and the joints of all of them were expected to be opened and they were. That is the chord was set higher than its permanent position in the bridge after it was swung clear of its false work, and in doing that it might occur that we could not get these ribs exactly to bear one with the other on its side surfaces, and when that occurred the only thing to do was to push it into its proper position or to pull it there.

Prof. KERRY.—As I understand it, when the chord number was set in place then the upper and lower cover plates went on, did they not?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—Now, how much of a play would that allow in the side sections of the chords?

Mr. MILLIKEN.—Well, in some cases we had to use a very small bolt in a $\frac{1}{2}$ hole. The joint was that much distorted and open that we could not put in—I think there were $\frac{1}{4}$ bolts used in some of the holes.

Prof. KERRY.—That would allow for a play of about $\frac{1}{8}$ of an inch, would it not?

Mr. MILLIKEN.—Yes, sir, there was no play there, the bolt went in tight; it was on account of the joint having been opened at the top and in contact at the bottom.

Prof. KERRY.—But in addition to being opened, the joint would be out of line, would it not?

Mr. MILLIKEN.—It might be slightly out of line, yes, sir.

Prof. KERRY.—Normally it would be held in line by the cover plate on top.

Mr. MILLIKEN.—The cover plate on top and its side connection plates.

Prof. KERRY.—You had no exceptional difficulties in any of these joints?

Mr. MILLIKEN.—No, sir.

Prof. KERRY.—How long did the anchor span remain on the false work?

Mr. MILLIKEN.—It remained on the false work about the middle of 1906.

Prof. KERRY.—About July, 1906?

Mr. MILLIKEN.—August.

Prof. KERRY.—Was the cantilever arm well under way at that time?

Mr. MILLIKEN.—Yes, sir.

SESSIONAL PAPER No. 154

Prof. KERRY.—How far would it be out before the removal of the false work commenced?

Mr. MILLIKEN.—The anchor arm commenced to work itself free of the false work under it and was practically free of it in the last of August of last year, and we had about eight or nine panels erected.

Prof. GALBRAITH.—Eight or nine panels?

Mr. MILLIKEN.—Eight panels of the cantilever arm.

Prof. GALBRAITH.—About the last of August?

Mr. MILLIKEN.—I cannot say that definitely; our progress reports will show that exactly.

Prof. KERRY.—Up to that date, were any of the joints riveted up, the main chord joints?

Mr. MILLIKEN.—August of 1906?

Prof. KERRY.—Up to the time that you got free of the false work?

Mr. MILLIKEN.—I think not.

Prof. KERRY.—They were all bulged?

Mr. MILLIKEN.—All bulged, yes, sir.

Prof. KERRY.—And had they come fairly well into position?

Mr. MILLIKEN.—Fairly well, yes, sir. In fact I did not examine the joints myself, Mr. Kinloch can answer that. He examined them all.

Prof. KERRY.—You waited for Mr. Kinloch's report?

Mr. MILLIKEN.—I talked with Mr. Yenser and Mr. Kinloch about it and asked how the joints were going and they would report. I talked to Mr. Kinloch about it, just in a general way.

Prof. KERRY.—And the joints would not be riveted up until they were satisfied they were bearing properly.

Mr. MILLIKEN.—We never riveted any of the joints until Mr. Kinloch and Mr. McLure were satisfied that the joint was in proper position to rivet.

Prof. KERRY.—In the lining process of the different members, that process took place just previous to riveting?

Mr. MILLIKEN.—The lining, I am not sure that I understand.

Prof. KERRY.—When you were lining out ribs of the chords which were not true?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—You had that done generally just previous to the riveting?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—That would not be bothered with up to that time?

Mr. MILLIKEN.—No, sir, I am not sure of that, it might have been lined up before.

Prof. KERRY.—Well, the definite instructions from Phoenixville, which are all a matter of record, will they cover such things as the removal of the false work?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—The instructions as to removing that at a certain date?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—So that the method would have been to report the condition to Phoenixville and then for Phoenixville to send instructions that a certain step should be taken?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—So that practically everything bearing on what was done, is in the erection instructions?

Mr. MILLIKEN.—In the erection instructions, yes, sir.

Prof. KERRY.—Would you consider, Mr. Milliken, that every step of that erection could be correctly traced out through those instructions?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—Will you arrange to have a set of these filed, for the use of the Commission, please?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—Have you them with you?

Mr. MILLIKEN.—No, not all of them.

Prof. KERRY.—We understand, Mr. Milliken, that the official papers of the bridge company bearing directly upon the erection consist of the erection instructions and the daily reports of Mr. Yenser.

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—Those two series cover all the records that are regularly kept?

Mr. MILLIKEN.—In connection with the erection, yes, sir.

Prof. KERRY.—Is there a full file of the correspondence between the Phoenix Bridge Company and Mr. Yenser?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—Here at present?

Mr. MILLIKEN.—Well, no, I thought you simply asked for the correspondence from Phoenixville after August 1 up to the time of the accident.

Mr. HOGGATE.—Were copies of the letters that Mr. Yenser wrote to Phoenixville kept in the office letter book at the Quebec bridge?

Mr. MILLIKEN.—Yes, sir.

Mr. HOGGATE.—Is that letter book there?

Mr. MILLIKEN.—Yes, sir.

Mr. HOGGATE.—I suppose all these communications will be to Mr. Yenser and not to Mr. Birks?

Mr. MILLIKEN.—In the first place to Mr. Yenser.

Mr. HOGGATE.—Will there be any to Mr. Birks.

Mr. MILLIKEN.—There has been some correspondence with Mr. Birks.

Mr. HOGGATE.—Anything of that nature between the office and Mr. Birks we would like to have just to go through it and see if there is anything that will bear on the information we are seeking?

Mr. MILLIKEN.—Mr. Birks' correspondence. I gave him authority to use my name in correspondence to Phoenixville, or his own.

After some discussion a book of plans was produced by Mr. Milliken, filed and marked as Exhibit 30. A book was produced by Mr. Milliken, filed and marked as Exhibit 31.

Prof. KERRY.—Would you indicate to us, Mr. Milliken, as nearly as you can, what material would have been on the bridge at the time of the accident, either actual bridge members which were not placed—?

Mr. MILLIKEN.—What material would have been on the bridge?

Prof. KERRY.—Yes?

Mr. MILLIKEN.—I do not quite understand.

Prof. GALBRAITH.—What material was on the bridge?

Mr. HOGGATE.—Not erected?

Prof. KERRY.—Or not necessarily for erection, it may have been just erection material?

Mr. MILLIKEN.—Of the permanent structure?

Prof. KERRY.—In addition to the permanent structure, not erected?

Mr. MILLIKEN.—Nothing except our working platform, consisting of planks and the necessary attachments for handling, and plates in position, the permanent members of the suspended span.

Prof. KERRY.—There was this small traveller, which we understand was on the third panel?

Mr. MILLIKEN.—The small traveller was in position on the third panel erected of the suspended span. The large traveller covered the ninth panel of the cantilever arm with its upper overhang and the lower front or end of it removed.

Prof. KERRY.—Removed off the bridge, is it?

Mr. MILLIKEN.—Removed off the bridge, yes, sir; together with all of the wooden shaze beams and a great deal of other rigging from the top of the main traveller.

SESSIONAL PAPER No. 154

Prof. KERRY.—So that practically there was no loose material on the bridge at all?

Mr. MILLIKEN.—No loose material, no, sir, other than what was necessary for the actual work to be done.

Prof. KERRY.—No main truss members sent in advance of erection? I understand your method was that a member went down on the cars and went straight from the cars into the structure?

Mr. MILLIKEN.—Well, the main truss members that were required to be put into position were usually held back until they were wanted right in the front or at the point of erection. They might be held south of the office on the track, or they might be held on the south bridge span, or they might be set up on the anchor arm. We did that on account of the danger of something dropping in the removal of the traveller on the locomotive or material. It was hardly ever moved to the front of the bridge until it was wanted to place the attachments on it, to place it in position.

Prof. KERRY.—And actually there was no such material forward at the time of the accident except what was just going to be put up?

Mr. MILLIKEN.—From the investigation I made in my judgment there was none.

Prof. KERRY.—And all the loose material from the traveller, with small exceptions, had been lowered to the ground?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—And there was no track material of any kind?

Mr. MILLIKEN.—No, sir.

Prof. KERRY.—Will you arrange to have prepared and filed with the Commission a diagram of the bridge showing the exact load that was on it?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—At the moment of the accident?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—That will include, of course, the weight itself of the actual members erected and the weights and positions of all the erection material that was at that time on the structure?

Mr. MILLIKEN.—Yes, sir.

Prof. GALBRAITH.—Could you from memory, Mr. Milliken, state the main members of the anchor arm which were not completely riveted up at the time of the accident? I have a plan here showing the progress, the state of progress on August the 29th, and I can assist your memory by this plan.

(Plan produced, filed and marked Exhibit No. 32.)

Mr. MILLIKEN.—When I left there I think there were two joints on the west chord of the anchor arm and two on the east chord of the anchor arm.

Prof. GALBRAITH.—This plan would not quite indicate that. Looking over the anchor span this progress diagram seems to show that chords 5 were still unriveted, chords 6 and 7 completed, riveted up, and the remaining panels to the centre pier not riveted. The question I wished to ask was what the special reason was for not finishing up the chords 5. They seem to have been left behind unfinished; the chords beyond them, the panels beyond them were completely finished. Was there any reason?

Mr. MILLIKEN.—No reason, unless the joint was not in proper contact, no reason because we should have had that riveted, we had plenty of riveters, and they were working out on the cantilever arm, and we were anxious to complete the riveting on the cantilever arm as rapidly as possible, because we wanted to go ahead and paint it and wanted all the riveting done before commencing painting.

Prof. GALBRAITH.—You know of no reason for that not being done?

Mr. MILLIKEN.—No, sir.

Prof. GALBRAITH.—Will a similar answer apply to the main panels containing the bottom chords 9 and 10 in the anchor arm?

Mr. MILLIKEN.—Yes, sir.

7-8 EDWARD VII., A. 1908

Prof. GALBRAITH.—The same reason or explanation will apply!

Mr. MILLIKEN.—No, sir.

Prof. GALBRAITH.—You know of no reason why those should not have been fully riveted up at the time of the accident?

Mr. MILLIKEN.—No reason except that.

Prof. GALBRAITH.—Can you tell from inspection now whether this is a correct progress diagram for the 29th of August (Exhibit 32)? The red lines indicate metal erected, the black lines indicate metal erected and riveted complete. It is perhaps difficult to do it in five minutes.

Mr. MILLIKEN.—It is correct.

Prof. GALBRAITH.—This plan, then, you say represents truly the condition of the work on the 29th of August?

Mr. MILLIKEN.—Yes, sir, except that not being riveted (indicating). I do not know if that is absolutely correct—the riveting as indicated there.

Prof. GALBRAITH.—Well, will you go over this; take this plan and show where it is wrong?

Mr. MILLIKEN.—I say I do not know of my own knowledge.

Mr. HOLGATE.—If you could furnish us with a statement showing the precise condition of the field riveting on each joint as existing on the 29th of August?

Mr. MILLIKEN.—We shall have to depend on Mr. Kinloch and Mr. McLure for that. Our foreman of riveters was Mr. Meredith.

Mr. HOLGATE.—A statement agreed on between Mr. Kinloch and Mr. McLure would, in your opinion, be correct?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—I notice in the wreck, Mr. Milliken, in regard to the connection between the stringers and floor beams, that the ends of certain of the railway stringers were punched for riveting to the floor beams, but the floor beams were riveted up without these holes being made any use of. What is the explanation of that? The vertical angle where say two floor beams came against the stringer, the vertical angle at the end of the floor beam at each end of the stringer was punched for riveting to the stringer, but not riveted up; only one stringer was riveted to the floor beam and the other was not.

Mr. MILLIKEN.—I presume that was probably an expansion, not a bolting hole.

Prof. KERRY.—If that was an expansion end, why were these angles punched for riveting in the first place? Would they not have been left without any rivet holes?

Mr. MILLIKEN.—The end stiffener angles?

Prof. KERRY.—Yes?

Mr. MILLIKEN.—If there were holes in there, I should imagine that is what they were for, unless the stringers you refer to were placed on temporarily; we had some stringers placed there temporarily. We were using the electric railway stringers for permanent structures, we had been using some stringers for carrying our main traveller.

Prof. KERRY.—Some of the stringers of the main structure were being used as part of the main traveller?

Mr. MILLIKEN.—In other words, the permanent metal floor of a portion of the anchor arm was not in places complete.

Prof. KERRY.—From whom will we secure a record of that?

Mr. MILLIKEN.—Our plans will indicate that.

Prof. KERRY.—The plans will indicate that?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—You recall Mr. Clark's evidence of Saturday, Mr. Milliken?

Mr. MILLIKEN.—I heard pretty nearly all of it, I think; yes, sir.

Prof. KERRY.—Would you have permitted that repaired chord to have been sent down to the bridge unless it was straight?

Mr. MILLIKEN.—No, sir.

SESSIONAL PAPER No. 154

Prof. KERRY.—Assuming that that chord was put into the bridge straight, what explanation can be offered of the deflection that was found in it?

Mr. MILLIKEN.—When you say straight, do you mean straight to a horizontal line?

Prof. KERRY.—Straight to a true horizontal line. It would be a very easy thing to see on a straight member of that kind, looking along the edge of it, a deflection of an inch.

Mr. MILLIKEN.—If I had seen a slight deflection, I would not have objected to it going in.

Prof. KERRY.—By a slight deflection, you would mean how much?

Mr. MILLIKEN.—Half an inch or three quarters of an inch in those long chord sections, in a long girder.

Prof. KERRY.—On such a deflection as was actually reported—Clark stated I think an inch and five-eighths, you would not have permitted that?

Mr. MILLIKEN.—Well, I would have reported the matter and consulted—I might have let it go in, but I would have conferred with Phoenixville immediately in regard to that.

Prof. KERRY.—As a matter of fact no such deflection was reported to you as being in the chord or was noticed by you at any time?

Mr. MILLIKEN.—Never, no, sir.

Prof. KERRY.—What explanation could you suggest or what force could have produced the deflection that is reported to have been measured?

Mr. MILLIKEN.—I do not know.

Prof. KERRY.—You would regard the occurring of such a deflection in a member that was originally straight, particularly in a member of these dimensions, as a most serious circumstance?

Mr. MILLIKEN.—If I had been absolutely certain that that member had been absolutely straight and that a deflection of that kind had occurred, why of course I would have been attracted by it and would not doubt have investigated it and watched it closely, but otherwise I should not have.

Prof. KERRY.—Would it be possible under the system of inspection that was existing for a defect of that nature to have passed through in such a way as to leave it open to question as to whether it existed or whether it did not?

Mr. MILLIKEN.—I am not thoroughly familiar with the rules of shop inspection.

Prof. KERRY.—So that so far as your own department is concerned, that member could have come down with that warp existing in it and not have been rejected?

Mr. MILLIKEN.—Yes, sir, after the material is shipped to us, we must assume it is all right unless it is damaged in transit.

Prof. KERRY.—Now this particular member could be said to have been damaged in transit?

Mr. MILLIKEN.—It was damaged in handling in our storage yard.

Prof. KERRY.—It can be considered to have been in transit?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—And it was actually repaired under your direction?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—So that if you had known there was any crookedness in the member at the time, it would have been made good?

Mr. MILLIKEN.—Certainly at the same time that the other repairs were made to it.

Prof. KERRY.—Could you express an opinion as to how near to failure a compression member of that shape would be when it had deflected under stress to the amount stated in Mr. Clark's evidence?

Mr. MILLIKEN.—No, sir, I could not.

Prof. KERRY.—Was there anyone present on the bridge who could have estimated that fairly?

Mr. MILLIKEN.—At the time of the accident?

Prof. KERRY.—At the time of the accident?

Mr. MILLIKEN.—Yes, sir, Mr. Birks; he had the stress sheets.

Prof. KERRY.—It is not a question of stress sheets, Mr. Milliken, it is a question of how serious a condition of a member that deflection indicated. You would have looked to Mr. Birks for advice on that point.

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—Have we any record of Mr. Birks' position on that?

Mr. MILLIKEN.—On that chord section?

Prof. KERRY.—In regard to the member which was warped?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—In what form?

Mr. MILLIKEN.—In the sketch which he sent to the Phoenixville office.

Prof. KERRY.—That will be found in the correspondence?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—Do you understand that the evidence of Mr. Clark to the effect that Mr. Birks did not know whether that was a stress deflection or a construction deflection, is correct?

Mr. MILLIKEN.—Mr. Clark's understanding of it?

Prof. KERRY.—Mr. Clark stated that Mr. Birks claimed that that deflection was in the construction of the chord previous to its being placed in the bridge. Have we any record as to whether that statement of Mr. Clark is correct or not?

Mr. MILLIKEN.—None that I know of.

Prof. KERRY.—If you had been present on the ground, Mr. Milliken, and in full possession of the facts in regard to these members, would you have considered it safe to further load them?

Mr. MILLIKEN.—Yes, sir.

Mr. HOLGATE.—In considering the scheme for erection, particularly for the lower chord system, were the erection strains considered—I am speaking now from the erection point of view—as eccentrically delivered to the end of the chord-sections or to be distributed?

Mr. MILLIKEN.—You mean the lower chords? Mr. Deans, I think, can explain that better than I can. I do not know anything about stresses.

Mr. HOLGATE.—Perhaps Mr. Deans can explain that. There is a point we want to clear up but we will reserve that question for Mr. Deans.

Prof. GALBRAITH.—Your visit extended from the 6th of August till the 26th, I think you said?

Mr. MILLIKEN.—Yes, sir.

Prof. GALBRAITH.—During that visit was your attention directed to any alleged dangerous parts in the bridge?

Mr. MILLIKEN.—Absolutely none.

Prof. GALBRAITH.—Did you visit any joints or other parts during that visit which you considered dangerous?

Mr. MILLIKEN.—No, sir.

Prof. KERRY.—Assuming a chord to have been perfectly straight when erected and to have subsequently deflected, how long, under the existing system of inspection, would such a defect have probably remained unobserved?

Mr. MILLIKEN.—In my judgment that is a very hard question to answer. I could not answer that question intelligently.

Prof. KERRY.—Would you say, then, that a close inspection of the erected members was considered to be the duty of the inspectors of the Quebec Bridge Company?

Mr. MILLIKEN.—Yes, sir, under the requirements of the field inspection by the Quebec Bridge Company?

Prof. KERRY.—And that the Phoenix Bridge Company depended on them to make that inspection?

Mr. MILLIKEN.—I cannot answer that.

SESSIONAL PAPER No. 154

Prof. KERRY.—Were the main members of the bridge under systematic inspection by the Phoenix Bridge Company?

Mr. MILLIKEN.—No, sir, not in the field.

Prof. KERRY.—What value did you place on the inspection by the Quebec Bridge Company?

Mr. MILLIKEN.—I placed the value upon them as inspectors that when we received it it was all right ready for erection.

Prof. KERRY.—I mean their field inspection.

Mr. MILLIKEN.—I thought the same of the field inspection as the shop inspection.

Prof. KERRY.—Were you depending on them to draw your attention to any defect in the main members which might develop?

Mr. MILLIKEN.—Not entirely so; no, sir.

Prof. KERRY.—But you had no organized inspection of your own?

Mr. MILLIKEN.—No, sir.

Prof. KERRY.—Was the time required for the erection closely estimated, Mr. Milliken?

Mr. MILLIKEN.—The time for the erection?

Prof. KERRY. The time required to do the erection work. Had that been closely estimated?

Mr. MILLIKEN.—No, sir.

Prof. KERRY.—You had never endeavoured to lay out a time programme for the work?

Mr. MILLIKEN.—Yes, this season I expected to complete the south half of the suspended span, to practically complete the riveting of the cantilever and anchor arms, remove the main traveller and erect it on the north side and complete the north shore false work ready for erection next spring.

Prof. KERRY.—But you had no closely planned time scheme, for example, that such and such things were to be finished by August 1?

Mr. MILLIKEN.—No, sir.

Prof. KERRY.—And Mr. Yenser was not endeavouring to live up to the requirements of any such time scheme?

Mr. MILLIKEN.—No, sir.

Prof. KERRY.—At the time of the accident was the condition of progress better than your expectation, or otherwise?

Mr. MILLIKEN.—Well, it was about up to our expectation, though he had lost a good deal of time on account of bad weather this season.

Prof. KERRY.—So that he would be a little more than usually anxious to get the material up?

Mr. MILLIKEN.—Not necessarily so; no, sir.

Mr. DAVIDSON.—I do not know if Mr. Milliken is aware of this, but in connection with the question that Prof. Kerry has just put to Mr. Milliken, I may say that my information is that the Phoenix Bridge Company's officials were being continually urged, almost to the extreme limit, by the Quebec Bridge people to push the work forward this season.

Mr. DEANS.—I wish to deny that absolutely.

Mr. DAVIDSON.—I do not say that all the information I get is absolutely correct.

Mr. DEANS.—That is absolutely wrong.

Mr. DAVIDSON.—But it does happen that a good deal I have had is correct so far.

Mr. STUART.—Not all of it—not all you expected to be.

Mr. HOLTGATE.—Do not argue about its correctness now; we will have Mr. Hoare explain that later.

Mr. STUART.—I do not think that either Mr. Milliken or Mr. Deans has been questioned about Mr. Yenser's competency.

Prof. KERRY.—Yes, that was earlier in the examination.

Mr. STUART.—It was not in Mr. Milliken's examination.

7-8 EDWARD VII., A. 1906

Prof. KERRY.—Mr. Deans was questioned in his evidence as to whether Mr. Yenser was competent.

Mr. STUART.—It was suggested that Mr. Yenser was subject to orders from various people, and I would like that matter cleared up by Mr. Milliken, and also that there was difficulty about getting men because of the supposed controversy on the subject of travelling expenses. I would suggest that these two points should be cleared up.

Mr. HOLGATE.—These points have both been answered.

Mr. STUART.—The last one has certainly not been.

Prof. KERRY.—The impression left in our minds by the statement in regard to Mr. Yenser was simply that he allowed himself to be influenced beyond his better judgment by other officials employed on the bridge.

Mr. STUART.—I think that is an entirely erroneous impression. That is the impression of a witness and nothing more.

Prof. KERRY.—We recognized it as such.

Mr. STUART.—I thought the opinion of a man who knew Mr. Yenser was worth something as correcting that impression as to whether he was likely to be influenced. I attach some importance to a statement that was made that there was a difficulty in getting men because of this controversy about travelling expenses, the statement in regard to which, I am instructed, was quite inaccurate. The controversy arose a great deal too late to affect the supply of bridgemen at all. It only arose at the time of the strike.

Prof. KERRY.—Have you had a satisfactory working force throughout the season?

Mr. MILLIKEN.—We have had a satisfactory force as far as the safety of the work is concerned, but in order to accomplish what we have outlined this year there, and on account of the unusual loss of time on account of bad weather this season we felt as though we had to increase our bridge men to the extent of 15 or 25 men, and that was partially the reason of my visit to Phoenixville under instructions of our chief engineer. On Saturday or Sunday prior to the accident I sent a bridge man out to secure men and he had already secured a number near Boston, of regular bridge erectors, and had them under orders to report at Quebec to Mr. Yenser. We had his telegram on Friday morning after the accident and we wired him to hold the men and report to Quebec before securing any more.

Prof. KERRY.—Up to the date of the accident you had been at any time able to hire the full working force you desired to employ?

Mr. MILLIKEN.—We had as many men as the work actually called for to carry it on, and with perfect safety, but in order to have it proceed more rapidly we thought, of course, to increase our force, and were arranging to do that.

Prof. KERRY.—Had you made previous unsuccessful efforts to increase your force?

Mr. MILLIKEN.—Well, we had made a number of efforts. On one occasion we paid the expenses of 22 bridge men out of New York, and when they arrived here there were only ten of them reported for duty, so that we lost twelve there which we had to replace, and we had twelve or fifteen come in from Buffalo, New York, and part of them also left without rendering any service whatever to the Bridge Company. The only thing for us to do—

Prof. KERRY.—Is that a usual happening?

Mr. MILLIKEN.—With that New York party it was rather an unusual thing to lose that percentage of the number. It is nothing unusual, when a party of fifteen or twenty-five bridge men are ordered to a point, that a few of them will drop out. But, we lost twelve out of twenty-two. We had paid their expenses from New York to Quebec.

Prof. KERRY.—Was there any explanation of that?

Mr. MILLIKEN.—Nothing that I had except some of them said that they had to walk too far to their boarding house, and various other excuses.

SESSIONAL PAPER No. 154

Prof. GALBRAITH.—Was this trouble that you are speaking of now about the 8th of August?

Mr. MILLIKEN.—No, that was in July, I think, that they were sent—June or July—I do not remember.

Prof. KERRY.—In case of a difference of opinion between Mr. Yenser and the engineers and the inspectors on the work, what were his instructions?

Mr. MILLIKEN.—Mr. Yenser had full control of the entire force employed on the work.

Prof. KERRY.—But he had not control of the inspectors of the Quebec Bridge Company?

Mr. MILLIKEN.—No, sir; only the Phoenix Bridge Company's employees.

Prof. KERRY.—In case of a difference of opinion between these gentlemen, what were his instructions?

Mr. MILLIKEN.—If there was a difference of opinion he would have discharged the man or reported it to Phoenixville. I cannot answer what he would have done, but he would have done one of the two things.

Prof. KERRY.—I do not mean by a difference of opinion, necessarily a quarrel or dispute, Mr. Milliken. The question is as to what was the proper procedure. He might consider one thing to be better to do and the engineer on the work might consider another thing was the better to do.

Mr. MILLIKEN.—In a case of that kind I suppose they would have to arrive at some agreement, or he would have to report it to the Phoenixville office, or wire, or telephone.

Prof. KERRY.—But he had authority to decide these points himself?

Mr. MILLIKEN.—He had authority to decide these matters himself. Yet, Mr. Yenser was a man who would never take advantage of authority. He was very conservative.

Prof. KERRY.—And was he very careful?

Mr. MILLIKEN.—Very careful, and would not take extreme measures simply because he was placed in authority.

Prof. KERRY.—On the other hand, was he a man who had a very considerable reliance on his own judgment?

Mr. MILLIKEN.—Yes, sir.

Mr. ROY.—There is one point that does not seem very clear as regards the inspection. I might suggest that you ask the witness whether or not it was the custom for the foreman of the Phoenix Bridge Company to examine all erected members all over the bridge, and then report to the superintendent of the work, Mr. Yenser. I think there is some confusion about the inspection. Maybe I have missed some part of the evidence; the question does not seem very clear from Mr. Milliken's evidence.

Prof. KERRY.—I think, Mr. Roy, that that question would be answered by a question that I asked Mr. Milliken. You remember we asked him explicitly if he had any systematic method of inspection of the members in the structure by the force of the Phoenix Bridge Company, and he said that he had not. That, I think, would be a direct answer to your question.

Mr. ROY.—Yes, although I think that the foreman used to examine the work already done. Of course, if you are satisfied the point is clear enough, I do not want any more.

Mr. HOLGATE.—I think I see what Mr. Roy means. The question was asked him here:

'Where did Mr. Yenser's reports go?

Mr. MILLIKEN.—They went to Phoenixville addressed to the Phoenix 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.' Possibly these reports would throw light on something Mr. Roy wants.

7-8 EDWARD VII., A. 1908

Mr. ROY.—The point I want to get at is this : From whom was the information necessary to Mr. Yenser to make these reports gathered ? Who supplied Mr. Yenser with the information necessary to send the reports to Phoenixville ? His foreman of riveters—Meredith ?

Prof. KERRY.—It has been stated, Mr. Milliken, that some of the members of the bridge were in a railroad wreck between Phoenixville and Quebec. Have you any record of that ?

Mr. MILLIKEN.—Yes, sir.

Prof. KERRY.—What members were those ?

Mr. MILLIKEN.—I do not remember. We have a record though, we can let you have it.

Prof. KERRY.—What became of the members ?

Mr. MILLIKEN.—They were repaired. They were minor members. I do not remember exactly what they were.

Prof. KERRY.—I think it would be well to submit a statement in regard to that. It might be a written statement which need not be a matter of evidence.

Mr. MILLIKEN.—It was in 1905.

Witness retired.

E. A. HOARE, recalled.

Mr. HOLGATE.—Will you please put in as exhibits plans of the bridge ? Are they in three packages ?

Mr. HOARE.—In three folios.

Mr. HOLGATE.—Do they contain the working plans of the bridge ?

Mr. HOARE.—Yes.

Mr. HOLGATE.—And strain sheets ?

Mr. HOARE.—Yes.

Mr. HOLGATE.—Certified copies ?

Mr. HOARE.—Certified by Mr. Cooper and the engineer of the Department of Railways and Canals.

Mr. HOLGATE.—And these plans are all the information in the shape of plans that you have ?

Mr. HOARE.—Yes, sir. Here is the index. (Folios of plans and index put in and marked Exhibits Nos. 33A, 33B, 33C and 33D.)

Commission adjourned to meet at ten a.m., Tuesday, September 17.

EIGHTH DAY.

QUEBEC, TUESDAY, September 17, 1907.

The Commission visited the lodgings in St. Joseph de Levis of Mr. Delphis Lajeunesse who, owing to his injuries, was unable to attend in response to the subpoena :—

Mr. LAJEUNESSE being sworn :

Mr. HOLGATE.—Were you employed by the Phoenix Bridge Company ?

Mr. LAJEUNESSE.—Yes, sir.

Mr. HOLGATE.—When did you start work for them ?

Mr. LAJEUNESSE.—In July, about the 23rd. I came down on the 22nd and started the day after. We started on Wednesday.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—Of this year?

Mr. LAJEUNESSE.—Yes, sir.

Mr. HOLGATE.—Were you continuously at work?

Mr. LAJEUNESSE.—Yes, sir.

Mr. HOLGATE.—What were you working at?

Mr. LAJEUNESSE.—I worked at every place on the bridge. I did everything—erection man, raising gang and riveters' gang.

Mr. HOLGATE.—Who was your foreman?

Mr. LAJEUNESSE.—I do not know his name. They called him Slim.

Prof. KERRY.—Meredith is his name?

Mr. LAJEUNESSE.—Yes.

Mr. HOLGATE.—You were working in the riveting gang?

Mr. LAJEUNESSE.—Yes, in the riveting gang. I worked about two weeks in the riveting gang.

Mr. HOLGATE.—Were you working on the day of the accident to the bridge on the riveting gang?

Mr. LAJEUNESSE.—No, not on the riveting gang. We just fitted up some riveting braces.

(The witness was shown plan marked Exhibit No. 26.)

Mr. HOLGATE.—Do you remember at what part of the bridge you were working on the 29th of August?

Mr. D. LAJEUNESSE.—I stood right there.

Mr. HOLGATE.—That is the point marked L on Exhibit 26? What were you doing at that point?

Mr. D. LAJEUNESSE.—On that buckskin. We put two braces in the centre and one at each end. We put the bolts down from the top chord to the bottom chord.

Mr. HOLGATE.—What is a buckskin?

Mr. D. LAJEUNESSE.—A box brace.

Mr. HOLGATE.—Was this joint at L completely riveted up?

Mr. D. LAJEUNESSE.—Yes.

Mr. HOLGATE.—At that time?

Mr. D. LAJEUNESSE.—Yes, sir.

Mr. HOLGATE.—Had you been working on the chords?

Mr. D. LAJEUNESSE.—I was working on the bottom of the chords at the centre posts—not on the chords. I went down on the chord. I worked just on the centre posts just putting some screw bolts in.

Mr. HOLGATE.—On the lower section of the centre posts?

Mr. D. LAJEUNESSE.—Yes, I worked on both sides. The last day I worked was on the Montreal side.

Mr. HOLGATE.—What were you doing there?

Mr. D. LAJEUNESSE.—Putting in some screw bolts. I was working on the chords with the riveters' gang on the Montreal side.

Mr. HOLGATE.—On the chords on the Montreal side of the bridge?

Mr. LAJEUNESSE.—Yes.

Mr. HOLGATE.—At the joint between chords 9 and 10?

Mr. D. LAJEUNESSE.—Yes. I was working about four days before the accident in the riveters' gang there with Alexander Beauvals.

Prof. GALBRAITH.—On the Montreal side?

Mr. D. LAJEUNESSE.—Yes.

Mr. HOLGATE.—Was that at the splice between 9 and 10 you were working?

Mr. D. LAJEUNESSE.—No, right in the post. Down that post you have a small plate. About ten riveters were working down that plate.

Mr. HOLGATE.—You started in the middle of chord 9 and went down to the middle of chord 10?

Mr. D. LAJEUNESSE.—Yes, just the row of rivets.

7-8 EDWARD VII., A. 1908

Mr. HOLGATE.—You were riveting?

Mr. D. LAJEUNESSE.—No, I was bucking up. On the morning before the accident I was working on the lower chord.

Mr. HOLGATE.—At the joint or on the chord?

Mr. D. LAJEUNESSE.—On top of the chord.

Mr. HOLGATE.—On the top of the chord at panel point No. 5 on the cantilever arm?

Mr. D. LAJEUNESSE.—Yes.

Mr. HOLGATE.—Was Mr. McCumber working there?

Mr. D. LAJEUNESSE.—I was just reaming some holes.

Mr. HOLGATE.—Were these holes in the bottom of the chord?

Mr. D. LAJEUNESSE.—Yes, right on the side of the chord.

Mr. HOLGATE.—On the underneath side?

Mr. D. LAJEUNESSE.—No, on the side.

Mr. HOLGATE.—Was that on some splice plates?

Mr. D. LAJEUNESSE.—Yes, some plates. I passed the reamer through three plates. I was working there at two o'clock.

Mr. HOLGATE.—You stopped working at that point at two o'clock on the day before the accident?

Mr. D. LAJEUNESSE.—No, on the same day. After leaving panel point 5 of the cantilever arm I went back to point J on the anchor arm, completed my work there and moved forward to point L, already referred to, and was at point L when the accident to the bridge took place.

Mr. HOLGATE.—Did you notice anything particular when the accident took place, or what did you notice first?

Mr. D. LAJEUNESSE.—I noticed something around here (indicating).

Mr. HOLGATE.—No, but just when the accident took place?

Mr. D. LAJEUNESSE.—I was on top just putting a turn on the rope to send up a box of bolts when I saw something jerk the bridge like that (indicating). I fell down in my box, stood up, fell down again, and I looked again. I thought the traveller had fallen down on the bridge. The traveller was in the same place. I came to this side of the bridge and I looked, and when I saw the bridge go down in that way I was on that chord, and I thought that chord made the bridge fall.

Mr. HOLGATE.—Was the first motion you felt on the bridge a jerking towards the river or was it a falling downwards?

Mr. D. LAJEUNESSE.—No, everywhere; it gave me a jerk towards the river. I was thrown six feet on the buck brace.

Mr. HOLGATE.—Which side of the bridge were you on?

Mr. D. LAJEUNESSE.—I was on the Montreal side of the bridge. I had just set the bolts down and the bridge fell down. I was just making a turn with the rope on the anchor arm, and my brother was waiting for me for the bolts, and he said you have not time to send them down, it is pretty near time to quit, and then the bridge went down.

Mr. HOLGATE.—Did you fall from L to the deck?

Mr. D. LAJEUNESSE.—No, I stood right in my place. Nothing came on top of me.

Mr. HOLGATE.—You stood at point L until it reached the ground?

Mr. D. LAJEUNESSE.—Yes, I remember everything. The first thing after I was down there I was looking at something coming up again, and after I got down there I just jumped about twenty feet. When I got down there I saw my brother. I saw some blood coming out. I was the first to come out, my brother was the second one, and the rest came out after me.

Mr. HOLGATE.—What did you observe at the time of the accident as to the manner in which the bridge fell? Do you remember distinctly what you observed at that time? You were on the Quebec side?

Mr. D. LAJEUNESSE.—No, I was on the Montreal side.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—Yes, on the Montreal side. Can you remember what you observed at the time?

Prof. KERRY.—He was jerked and he was thrown six feet on the buck brace.

Mr. HOLGATE.—Jerked towards the river?

Mr. D. LAJEUNESSE.—I did not fall down outside the bridge. It just caught me. I think it was on the deck. I thought it was the traveller coming down.

Prof. KERRY.—It threw you outside towards the bridge?

Mr. D. LAJEUNESSE.—It threw me outside to the box brace. I was standing up on the box and it knocked that box down. I fell down in the box, and I stood up and looked to see what was the matter. I thought it was the big traveller down. When I saw the traveller in the same place I looked inside and I saw the brace on the Quebec side. I said, 'Well, I am finished,' and I thought so.

Prof. KERRY.—Then the bridge fell down towards the Quebec side?

Mr. D. LAJEUNESSE.—Yes. But I stood there; nothing came over on me. When I saw the post come down I thought it was coming down on top of me, but it did not.

Prof. KERRY.—Could you see where it broke first?

Mr. D. LAJEUNESSE.—I never saw anything broke. I saw where it was crooked.

Prof. KERRY.—You did not see where it was broken?

Mr. D. LAJEUNESSE.—I saw something a couple of days before the accident. Every man on the bridge in the morning said, 'Go and see that.' About eight feet from that post (indicating on plan) going up was crooked outside on the Quebec side.

Mr. HOLGATE.—Eight feet beyond panel point No. 10, in the cantilever arm, chord 9, on the Quebec side. You might just describe what you saw here. First of all, when did you see it?

Mr. D. LAJEUNESSE.—A couple of days before the accident—when I was working at the centre post. I went down at that place. I never saw that before that day.

Mr. HOLGATE.—What was the first time before that you went down and you did not see it?

Mr. D. LAJEUNESSE.—About six days before.

Mr. HOLGATE.—You did not see it then?

Mr. D. LAJEUNESSE.—No, I did not see anything then. When I saw those bridge men going and looking, it gave me a scare and I wanted to quit after I saw it.

Mr. HOLGATE.—The first time you saw it, was when?

Mr. D. LAJEUNESSE.—Monday or Tuesday.

Mr. HOLGATE.—Was anybody with you?

Mr. D. LAJEUNESSE.—Yes, every bridge man on the bridge. My brother was on the bridge and I asked him: What the hell are you looking at, and when he told me I said, By God.

Mr. HOLGATE.—Just tell us what it was you saw?

Mr. D. LAJEUNESSE.—It was about 2 inches crooked.

Mr. HOLGATE.—Was it bent sideways?

Mr. D. LAJEUNESSE.—It was crooked, curved or bulged towards the Quebec side.

Mr. HOLGATE.—That was the chord, was it?

Mr. D. LAJEUNESSE.—Yes.

Mr. HOLGATE.—These chords have four plates?

Mr. D. LAJEUNESSE.—These four plates were crooked.

Mr. HOLGATE.—Was that bent part long or short?

Mr. D. LAJEUNESSE.—Just short. It was about two or three feet long and one or two inches bulge. I could see it by the eye on top of the bridge.

Mr. HOLGATE.—That bend was here (indicating) on the Quebec side?

Mr. D. LAJEUNESSE.—Yes.

Prof. GALBRAITH.—Is he speaking of the ribs or the splice plates?

Prof. KERRY.—The ribs.

Prof. GALBRAITH.—Of the four ribs simply?

Mr. D. LAJEUNESSE.—Yes.

Prof. GALBRAITH.—Close to the cover plate ?

Mr. D. LAJEUNESSE.—Yes.

Prof. KERRY.—And all bent towards Quebec ?

Mr. D. LAJEUNESSE.—Yes.

Prof. KERRY.—When that bend took place were the cover plates there or were the lacing angles in ?

Mr. D. LAJEUNESSE.—You have a cover plate on top about a foot above this place. It was about two feet away from the cover plate.

Prof. KERRY.—Was that on Monday or Tuesday ?

Mr. D. LAJEUNESSE.—One of these two days.

Mr. HOLGATE.—But you do not remember.

Mr. D. LAJEUNESSE.—I do not remember.

Mr. HOLGATE.—You brother was with you then ?

Mr. D. LAJEUNESSE.—Yes.

Mr. HOLGATE.—Who else ?

Mr. D. LAJEUNESSE.—All the bridge men were on top. I was the last man on the top of the bridge and I saw all the men looking, and I asked : What is the matter, and he said : Can you see that bottom chord ?—it is crooked. I said : By God, I am going home before some accident.

Prof. KERRY.—That was when ?

Mr. D. LAJEUNESSE.—Seven o'clock in the morning.

Prof. KERRY.—That would be Tuesday morning ?

Mr. HOLGATE.—Most likely seven o'clock Tuesday morning.

Mr. D. LAJEUNESSE.—We had not started work when we saw this—five minutes before seven.

Mr. HOLGATE.—But you went ahead and worked ?

Mr. D. LAJEUNESSE.—Yes.

Mr. HOLGATE.—You went to work at panel point No. 5 ?

Mr. D. LAJEUNESSE.—No, I was working there at that time.

Mr. HOLGATE.—How did you get there ?

Mr. D. LAJEUNESSE.—I walked over the track to some place near panel point No. 6 and walked along the chord to the cantilever pier.

Mr. HOLGATE.—Do you recollect at this place, on chord 9, that you spoke of, if the top cover plate was on and riveted up ?

Mr. D. LAJEUNESSE.—Yes.

Mr. HOLGATE.—Was the bottom cover plate riveted up ?

Mr. D. LAJEUNESSE.—Yes, all riveted up.

Mr. HOLGATE.—Was this joint all made up ?

Mr. D. LAJEUNESSE.—Yes, all finished. A couple of weeks before we were moving that scaffold.

Mr. HOLGATE.—That is at panel point 9 several days before that you moved away the scaffold ?

Mr. D. LAJEUNESSE.—Yes.

Mr. HOLGATE.—The scaffold was there for the purpose of finishing up the joint of chord No. 8 ?

Mr. D. LAJEUNESSE.—It was all finished.

Mr. HOLGATE.—Was the bottom plate in place on chord 8 ?

Mr. D. LAJEUNESSE.—Yes, it was in place, and riveted, too.

Mr. HOLGATE.—Did you notice anything else on any of these chords ?

Mr. D. LAJEUNESSE.—No, I did not see anything else.

Mr. HOLGATE.—Did you notice the joint at this place here on chord 8 which is marked 'joint' on the plan ?

Mr. D. LAJEUNESSE.—No.

Mr. HOLGATE.—Did you hear anything spoken about that joint on chord 8 at that time ?

SESSIONAL PAPER No. 154

Mr. D. LAJEUNESSE.—No.

Mr. HOLGATE.—The only joint that was spoken about was one on chord 9?

Mr. D. LAJEUNESSE.—On chord 9, that is all.

Prof. GALBRAITH.—They are both on chord 9.

Mr. HOLGATE.—Is the place where you saw the bulge in this panel (indicating) between the figures 9 and 10?

Mr. D. LAJEUNESSE.—Nearer towards point 10.

Mr. HOLGATE.—Then do I understand that you saw nothing out of order in panel 8?

Mr. D. LAJEUNESSE.—No, I did not see anything.

Prof. GALBRAITH.—What day was that?

Mr. HOLGATE.—At seven o'clock on the Tuesday before the accident.

Mr. D. LAJEUNESSE.—The whistle blows five minutes before the work begins.

Mr. HOLGATE.—Who was it who first spoke about it being crooked?

Mr. D. LAJEUNESSE.—All the bridgemen from all over the bridge. When I saw every man stop I asked my brother, who was there talking French and who was with me, 'What is the matter?' He says, 'Look on that chord.' I said, 'It is dangerous.' He said, 'Oh, no, it is strong enough to hold me.' We went to work, and the next day we fell down. When I saw some one go down there—the president of the Union—

Mr. HOLGATE.—Who is he?

Mr. D. LAJEUNESSE.—Mr. Haley, and Mr. Cook was the secretary. I was waiting on him outside on Wednesday night, the day before the accident, to give him my books for my Union. I was waiting about half an hour, and some one said to me, 'Just look at that chord.' I saw Mr. Cook and Mr. Haley go down there, and after they had been there half an hour I saw them going away. I do not know what they did there.

Mr. HOLGATE.—It was just Cook and Haley?

Mr. D. LAJEUNESSE.—Cook, Haley, and some other fellows. I do not know their names. There were three or four.

Mr. HOLGATE.—When you observed that bulge, in the chord in panel 9, did you notice anything wrong with the lacing angles?

Mr. D. LAJEUNESSE.—No, I did not see anything. I did not look at that, I just looked at the chord that was crooked. I did not see the angles there.

Mr. HOLGATE.—You do not think it was crooked enough to affect the angles?

Prof. GALBRAITH.—I did not see that after Tuesday night?

Mr. D. LAJEUNESSE.—I did not see that but that day.

Prof. GALBRAITH.—You looked on Wednesday?

Mr. D. LAJEUNESSE.—Yes.

Prof. GALBRAITH.—You looked on Thursday morning?

Mr. D. LAJEUNESSE.—Yes, I looked every morning going out.

Prof. GALBRAITH.—You saw it three days?

Mr. D. LAJEUNESSE.—Yes, three days, all the time in the same place. I think they were moving; I do not know.

Mr. HOLGATE.—Could you notice any change that had taken place in it, did it look any worse?

Mr. D. LAJEUNESSE.—No, I did not look long enough; I just saw it was more crooked; it was the same place all the time. Somebody said that Foreman Worley said, 'Oh, never mind, we put it like that.'

Mr. HOLGATE.—What do you think Mr. Worley meant by that?

Mr. D. LAJEUNESSE.—I thought that piece was the same way as it had been there.

Mr. HOLGATE.—As it was in?

Mr. D. LAJEUNESSE.—Yes, I do not know, when I started to work it was over there in front.

Mr. HOLGATE.—Do you recollect your attention being called to any other matters like that on the bridge?

7-8 EDWARD VII., A. 1908

Mr. D. LAJEUNESSE.—No, I did not see anything. I worked every place on the bridge, on top, on the centre post, from the top down to the bottom, I did not see anything.

Mr. HOLGATE.—Did you often go on the bottom chord on the anchor arm?

Mr. D. LAJEUNESSE.—Yes, going up and going down.

Mr. HOLGATE.—You spoke a little while ago about working with Beauvais at some place on the lower chord on the Montreal side, in the anchor arm?

Mr. D. LAJEUNESSE.—Yes.

Mr. HOLGATE.—Was that at the post between panel 9 and panel 10?

Mr. D. LAJEUNESSE.—Right there (indicating). There on the cover plate, the two cover plates. We put some rivet plates on the side.

Mr. HOLGATE.—On the side of the chord?

Mr. D. LAJEUNESSE.—Yes.

Mr. HOLGATE.—Was that at the splice between panel 9 and panel 10?

Mr. D. LAJEUNESSE.—Yes.

Mr. HOLGATE.—On each side of the post?

Mr. D. LAJEUNESSE.—Yes. I was riveting on the box brace going from the Montreal side to the Quebec side.

Mr. HOLGATE.—What day was this that you were working there?

Mr. D. LAJEUNESSE.—I think it was a week before, I do not remember.

Mr. HOLGATE.—Did they finish the work they were at?

Mr. D. LAJEUNESSE.—Over there, no. They were working there that day?

Mr. HOLGATE.—You left the gang and worked on something else?

Mr. D. LAJEUNESSE.—Yes, they put some Indian fellows.

Mr. HOLGATE.—And the gang with Beauvais stayed there, did they?

Mr. D. LAJEUNESSE.—Stayed there, I think they were there on that day. I saw 400 rivets put inside those four plates.

Mr. HOLGATE.—When you left they had 400 rivets to put in?

Mr. D. LAJEUNESSE.—I think they had 200 or 300 rivets, 300, 400, you see the four plates in the bottom chord they had to rivet inside. I think they had about 100 rivets to finish at that place?

Prof. KERRY.—When the bridge fell?

Mr. D. LAJEUNESSE.—Yes. When I left them he was working over there, he had big work to do. I saw him go up there when the bridge fell.

Mr. HOLGATE.—When you were working there with Beauvais did anything unusual happen?

Mr. D. LAJEUNESSE.—No, we did not see anything there.

Mr. HOLGATE.—Was there anything that appeared to you to be out of line?

Mr. D. LAJEUNESSE.—No.

Mr. HOLGATE.—On that chord?

Mr. D. LAJEUNESSE.—I did not see anything.

Mr. HOLGATE.—Or any place in that neighbourhood?

Mr. D. LAJEUNESSE.—No, it was all good over there.

Mr. HOLGATE.—Now, before you started riveting was that joint bolted up?

Mr. D. LAJEUNESSE.—Yes, bolted up.

Mr. HOLGATE.—Fully bolted?

Mr. D. LAJEUNESSE.—Yes, fully bolted up.

Mr. HOLGATE.—Was every hole filled?

Mr. D. LAJEUNESSE.—Yes, we did not pass any reamer. Sometimes they have to pass a reamer.

Mr. HOLGATE.—Were all the bolts the same size?

Mr. D. LAJEUNESSE.—Yes.

Mr. HOLGATE.—What size?

Mr. D. LAJEUNESSE.— $\frac{1}{2}$.

Mr. HOLGATE.—All the holes were filled with $\frac{1}{2}$ bolts?

SESSIONAL PAPER No. 154

Mr. D. LAJEUNESSE.—Yes, I did not look very well.

Prof. GALBRAITH.—I would like to know something about the other one on the Montreal side, opposite the joint between 9 and 10? It is on the 9th chord, that splice, the other end of the 9th chord.

Mr. HOLGATE.—Did you ever work at the splice in the 9th chord near the panel point marked 9?

Mr. D. LAJEUNESSE.—No, I did not work there at all. I passed in on that side. The only thing I see, they had those runners there sent out.

Mr. HOLGATE.—I understand you passed along there?

Mr. LAJEUNESSE.—Yes, that is all I see.

Mr. HOLGATE.—Can you recollect anything about the bolting up of them?

Mr. D. LAJEUNESSE.—They were riveting there.

Mr. HOLGATE.—Riveting there?

Mr. D. LAJEUNESSE.—When I started working on the bridge they were working at that place.

Mr. HOLGATE.—Can you remember if that joint near panel point 9 was riveted up when the bridge fell?

Mr. D. LAJEUNESSE.—The riveting was all finished there.

Prof. GALBRAITH.—All finished?

Mr. D. LAJEUNESSE.—All finished.

Prof. GALBRAITH.—On both sides of the bridge.

Mr. D. LAJEUNESSE.—On both sides, the two sides, there is only on that side there, the two joints there; the Quebec side was finished.

Prof. GALBRAITH.—You refer now to panel point No. 10?

Mr. D. LAJEUNESSE.—Yes.

Prof. GALBRAITH.—The panel point, the No. 9 splice, was riveted; was it completely riveted on both sides?

Mr. D. LAJEUNESSE.—Yes, completely riveted; I was moving the scaffolding myself there. The other gang was working around here—Paul La Hache.

Mr. HOLGATE (to Eugène Lajeunesse).—Are you following what your brother says?

Mr. EUGENE LAJEUNESSE.—Yes, Alexander Beauvais finished that other side.

Mr. HOLGATE.—So far as what his brother says, he is correct as he understands it?

Mr. EUGENE LAJEUNESSE.—No, he does not know all.

Mr. HOLGATE.—Is there anything within his knowledge in his brother's statement that he can corroborate? If there is he might speak of it.

Mr. EUGENE LAJEUNESSE (speaking in French).—About the men working there was a gang of men working on the other side, but my brother probably does not know, because he was not working there.

Mr. HOLGATE.—So far as he knows he is clear upon that point 9, and that Beauvais had finished up there?

Prof. GALBRAITH.—Between 9 and 10.

Mr. Eugene LAJEUNESSE.—He was putting the finish; that riveting gang stopped the work three days before.

Prof. GALBRAITH.—He has said already there is nothing wrong with that joint 9 and 10.

Mr. HOLGATE.—Yes, he says that is all straight.

Mr. D. LAJEUNESSE.—On the Quebec side?

Mr. HOLGATE.—Yes?

Mr. D. LAJEUNESSE.—Myself and my brother and another one were moving that scaffold.

Mr. HOLGATE.—You never saw anything wrong on the Montreal side?

Mr. D. LAJEUNESSE.—No, I never saw anything wrong there.

Prof. GALBRAITH.—He has already said that; on both sides; between 8 and 9 he never saw anything.

Mr. HOLGATE.—He said that had been finished and he saw nothing wrong.

Prof. GALBRAITH.—On both sides?

Mr. D. LAJEUNESSE.—On both sides; once I was riveting and another time not.

Prof. GALBRAITH.—That means all four joints, the two 9 and 10 and the two 8 and 9?

Mr. HOLGATE.—Yes, and on the Quebec side; the joint between 9 and 10, when the accident happened, must have had at least another 100 rivets to go in.

Prof. GALBRAITH.—Yes.

Mr. HOLGATE.—Are there any other joints in the lower chord—?

Mr. D. LAJEUNESSE.—No, I did not see anything.

Mr. HOLGATE.—Were they all riveted up?

Mr. D. LAJEUNESSE.—No, some riveters were on there; I do not know which plate.

Mr. HOLGATE.—There was some riveting yet to be done on the lower chord of the anchor arm, but you do not know which one?

Mr. D. LAJEUNESSE.—I do not know which place.

Mr. HOLGATE.—You spoke about something on the cover plate.

Mr. D. LAJEUNESSE.—Yes, on the Quebec side; I saw Mr. Yenser going down there at the time when someone said the plate was crooked. I was bolting the screw bolts and he said: 'You know that chord; when you have finished inside you put some bolts in it, pass the reamer and put in some bolts.'

Mr. HOLGATE.—That is where chord 10 joined the centre post on the Montreal side?

Mr. D. LAJEUNESSE.—The Montreal side.

Mr. HOLGATE.—What day was that?

Mr. D. LAJEUNESSE.—That was on the same day, on Tuesday, I think.

Mr. HOLGATE.—And how many bolts did you put in?

Mr. D. LAJEUNESSE.—I did not put any in. He sent me up, he told me to go up and help some fellow on top.

Mr. HOLGATE.—He instructed you to put bolts there?

Mr. D. LAJEUNESSE.—Yes.

Mr. HOLGATE.—Did somebody else put those bolts there?

Mr. D. LAJEUNESSE.—No, nobody, I did not see anybody.

Mr. HOLGATE.—Did you see the place itself?

Mr. D. LAJEUNESSE.—Yes, I saw the place.

Mr. HOLGATE.—How many bolts had to go in there?

Mr. D. LAJEUNESSE.—About 50 bolts, 40 or 50.

Mr. HOLGATE.—If 50 bolts had been put in there would that have filled up everything?

Mr. D. LAJEUNESSE.—Yes, we have about 60 bolts, 70 bolts, we always screw them up and like to put 50 more.

Mr. HOLGATE.—Is that where the chord joined the shoe?

Mr. D. LAJEUNESSE.—Yes.

Prof. GALBRAITH.—The stub chord?

Mr. D. LAJEUNESSE.—Yes, where the chord crosses to the centre post. It is about two feet away from the centre post.

Mr. HOLGATE.—Two feet on the anchor arm side from the centre post?

Prof. GALBRAITH.—That was the spliced centre chord of the stub chord.

Mr. D. LAJEUNESSE.—Yes, on the side chord, he told me to put some bolts there.

Mr. HOLGATE.—The 10th chord?

Prof. PERRY.—He said that bolts were to be put in in the connection between the stub chord and chord No. 10 on the anchor arm?

Mr. HOLGATE.—Did you see that place again?

Mr. D. LAJEUNESSE.—For these bolts there?

Mr. HOLGATE.—Yes.

Mr. D. LAJEUNESSE.—No, I did not go down after that, he sent me up to move that scaffold, our riveters' gang, I did not see it, I did not go down.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—So you cannot say if the bolts were put in ?

Mr. D. LAJEUNESSE.—No, I did not see it; only me and my brother do that work.

Mr. HOLGATE.—You said it was Yenser who went down there ?

Mr. LAJEUNESSE.—Yes, and the other inspector, Birks. He went down and looked at that place and after that he called me and said : You put some bolts in when you finish that side.

Prof. GALBRAITH.—What day was that ?

Mr. D. LAJEUNESSE.—On Tuesday.

Mr. HOLGATE.—Did you notice any of the plates in any part of the bridge cracked ?

Mr. D. LAJEUNESSE.—I never saw any place, I worked all around the bridge and did not see any crack in that bridge.

Mr. HOLGATE.—Were you ever up here at this part of the bridge at the centre post where these plates are (indicating) ?

Mr. D. LAJEUNESSE.—Yes, they have one plate going like that and another one going like that (the witness indicated plates going in various directions).

Mr. HOLGATE.—Were you there more than once ?

Mr. D. LAJEUNESSE.—Oh, yes, I worked in there about 15 days on that place.

Mr. HOLGATE.—And during those 15 days did you notice anything wrong ?

Mr. D. LAJEUNESSE.—I never saw anything wrong, that plate was put like that.

Mr. HOLGATE.—You mean that the plate was bent on purpose ?

Mr. D. LAJEUNESSE.—Yes, they made it like that, it never cracked that way.

Mr. HOLGATE.—It was crimped ?

Mr. D. LAJEUNESSE.—Yes, crimped, I never saw a crack there.

Mr. HOLGATE.—You are pretty sure there was no crack there ?

Mr. D. LAJEUNESSE.—Yes, I am pretty sure, me and my brother worked 15 days there and I did not see anything cracked.

Mr. HOLGATE.—Did you hear anything about a cracked plate there while working on the bridge ?

Mr. D. LAJEUNESSE.—No, I never saw any cracked plate there.

Mr. HOLGATE.—Did you ever hear any one speak of that ?

Mr. D. LAJEUNESSE.—No, nobody told me, this is the first time anybody tells me.

Prof. GALBRAITH.—Did you hear of anything wrong with any other joints in the chords besides those you have been speaking about ?

Mr. D. LAJEUNESSE.—I did not see anything.

Prof. GALBRAITH.—Did you hear ?

Mr. D. LAJEUNESSE.—No, I did not see anything dangerous in that bridge about chord 9.

Mr. HOLGATE.—Did anybody speak to you about anything else in that bridge that was wrong ?

Mr. D. LAJEUNESSE.—No, nobody ; until on that morning, when somebody said about that chord. I worked and nobody told me there is anything dangerous.

The witness retired.

The Commission held a session in the Lévis Hospital.

ALEXANDER BEAUVAIS sworn.

Mr. HOLGATE.—You were an employee of the Phoenix Bridge Company ?

Mr. BEAUVAIS.—Since last May up to the time of the accident.

Mr. HOLGATE.—Since May, 1907 ?

Mr. BEAUVAIS.—1907.

Mr. HOLGATE.—And you worked at the Quebec bridge ?

Mr. BEAUVAIS.—The Quebec bridge, south side.

Mr. HOLGATE.—On the south side ?

Mr. BEAUVAIS.—Yes, sir.

154—vol. ii—13

Mr. HOLGATE.—Continuously?

Mr. BEAUVAIS.—As the weather permitted.

Mr. HOLGATE.—What was the nature of the work that you were busy at?

Mr. BEAUVAIS.—I was on riveting most of the time.

Mr. HOLGATE.—Was your work entirely confined to the anchor arm, or where?

Mr. BEAUVAIS.—I was working on the anchor arm, I never worked outside the pier.

Mr. HOLGATE.—You never worked outside the pier?

Mr. BEAUVAIS.—All this season.

Mr. HOLGATE.—By that do I understand that you worked last season?

Mr. BEAUVAIS.—I worked three seasons.

Mr. HOLGATE.—But this year you worked from May?

Mr. BEAUVAIS.—From May up to the time of the accident.

Mr. HOLGATE.—Previous to working on the Quebec bridge, did you do work on other bridge construction?

Mr. BEAUVAIS.—Yes, I worked for Dominion Bridge Company and the Canadian Bridge Company, four or five different jobs.

Mr. HOLGATE.—For some years?

Mr. BEAUVAIS.—Since six years, I guess this is my sixth year.

Mr. HOLGATE.—Who was your foreman this season on the work?

Mr. BEAUVAIS.—C. E. Meredith, rivet boss we called him.

Mr. HOLGATE.—Then your own position under Mr. Meredith is what?

Mr. BEAUVAIS.—I was the head of a four gang, running a gang of four men.

Mr. HOLGATE.—A gang of four men riveting?

Mr. BEAUVAIS.—Yes.

Mr. HOLGATE.—And that work was confined entirely to the anchor arm?

Mr. BEAUVAIS.—Yes, sir, the anchor arm.

Mr. HOLGATE.—Were there other riveting gangs on the anchor arm?

Mr. BEAUVAIS.—There was one that just moved from there about two or three days before the accident. The best I can remember, there was no gang besides our gang working on the anchor arm.

Mr. HOLGATE.—What was the condition of the riveting work on the anchor arm when you began work this season in May? How far had the riveting work proceeded?

Mr. BEAUVAIS.—It was very little riveted, it was only on the towers and perhaps one-fifth of it was riveted, but the towers. I do not think there was any other place riveted to my knowledge, because last summer or the summer before last we only had a gang or two, sometimes only a single gang, and this summer sometimes seven or eight.

Mr. HOLGATE.—On the anchor arm?

Mr. BEAUVAIS.—Well, I think on the anchor arm at first we had four.

Mr. HOLGATE.—This season?

Mr. BEAUVAIS.—Yes, this season.

Mr. HOLGATE.—Was there some riveting work going on on the anchor arm the whole of this season, was there always riveting on the anchor arm this season?

Mr. BEAUVAIS.—Always riveting, yes.

Mr. HOLGATE.—At the time of the accident, what, as far as your knowledge goes, was the general condition of riveting, how far had it proceeded?

Mr. BEAUVAIS.—Oh, the riveting was almost completed up to the working gang, almost up to the working, almost completed, the riveting was.

Mr. HOLGATE.—Almost completed up to the working gang that was working on the cantilever arm?

Mr. BEAUVAIS.—Yes, there was riveting on the cantilever arm, too.

Mr. HOLGATE.—That is they were following up as fast as they could with the riveting?

Mr. BEAUVAIS.—They were almost up to the erectors, the riveters were.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—What was the condition then of the posts, as far as riveting is concerned on the anchor arm?

Mr. BEAUVAIS.—The posts?

Mr. HOLGATE.—At the time of the accident?

Mr. BEAUVAIS.—I saw nothing wrong about the posts. To my knowledge I saw nothing out of the way.

Mr. HOLGATE.—Then can you say as to the condition of riveting that existed at the time of the accident in the lower chords?

Mr. BEAUVAIS.—The lower chords, they were bent.

Mr. HOLGATE.—But with regard to riveting, can you remember, starting from the anchor pier, and going along the bottom chord on the Quebec side of the bridge?

Mr. BEAUVAIS.—I only worked two joints on that bottom chord. There is the only two joints I worked on the Quebec and Montreal side, the east and west side (indicating on Exhibit No. 26).

Mr. HOLGATE.—On the east and west side, that is at the first post from the centre post?

Mr. BEAUVAIS.—The first post from the shoe.

Mr. HOLGATE.—On the anchor arm?

Mr. BEAUVAIS.—On the anchor arm.

Mr. HOLGATE.—That is the joint between panels 9 and 10?

Mr. BEAUVAIS.—Yes.

Mr. HOLGATE.—You worked on that joint, on both sides of it?

Mr. BEAUVAIS.—The Quebec side, and I was on the Montreal side at the time it fell.

Mr. HOLGATE.—Had you finished your work on the Quebec side?

Mr. BEAUVAIS.—They finished it, and moved to the Montreal side.

Mr. HOLGATE.—Was the joint on the Quebec side when you finished it completely riveted up?

Mr. BEAUVAIS.—Every hole excepting one, I remember which was a blind hole.

One plate was not punched.

Mr. HOLGATE.—With the exception of that, though, the joint was complete?

Mr. BEAUVAIS.—Yes.

Mr. HOLGATE.—That is the top plates, bottom plates, and side plates?

Mr. BEAUVAIS.—Everything was on, every hole, bottom plates, top plates, every hole, everything was on.

Mr. HOLGATE.—When you started work on that splice, on the Quebec side, how did you find it?

Mr. BEAUVAIS.—Well, the holes were all right, they were good holes, and then—that is an awful big joint, we were there for two weeks, we could notice a bulging, coming together. There are four ribs; the centre ribs were coming together, no, much, but one could notice it.

Mr. HOLGATE.—They were getting nearer together, the ribs were?

Mr. BEAUVAIS.—Yes.

Mr. HOLGATE.—At the end of each chord?

Mr. BEAUVAIS.—Right here at the splice of this chord, this 9 and 10 chord.

Prof. GALBRAITH.—Which side of the post?

Mr. BEAUVAIS.—On the inside.

Mr. HOLGATE.—It is in panel 10. Well, if the ribs were coming closer together, that would cause the plate to bulge?

Mr. BEAUVAIS.—You had to get the bottom plate off to work in there, so as to work in there. Of course we managed to get the plate back on again.

Mr. HOLGATE.—In the same holes?

Mr. BEAUVAIS.—Yes, in the same holes. The holes were not very bad, because it did not close much, we got the holes again.

Mr. HOLGATE.—Did you manage to put it back again with drift pins?

Mr. BEAUVAIS.—Yes, just drift pins.

Mr. HOLGATE.—But there was a tendency of the ribs—

Mr. BEAUVAIS.—Yes, but very little. Of course we could notice because we had heard before of ribs bending, because there was another gang driving the same way as we were, driving the same kind of joints, bottom chords?

Mr. HOLGATE.—Where were they working?

Mr. BEAUVAIS.—Out on the cantilever arm, about the fifth or sixth panel.

Mr. HOLGATE.—Now, to come back to that joint on the Quebec side, when you went to start your riveting work was that joint pretty well bolted up?

Mr. BEAUVAIS.—Well, it was all jointed up except that they were not very tight, and of course we had to tighten them bolts up again, that is on the Quebec side.

Mr. HOLGATE.—Was there a large quantity of bolts, a large proportion?

Mr. BEAUVAIS.—There were very few holes vacant on the Quebec side.

Mr. HOLGATE.—Did it differ materially from other joints you had noticed, before you went to work on it; was it bolted up as well as any other joint?

Mr. BEAUVAIS.—Not at all; it was pretty well bolted up because only a few holes were vacant.

Mr. HOLGATE.—Generally speaking, when you went on a joint did you find it in that condition, pretty well bolted up?

Mr. BEAUVAIS.—I found it sometimes very different from this. On the Montreal side it was very bad, very few holes bolted.

Prof. GALBRAITH.—On the Montreal side, the very same joint?

Mr. BEAUVAIS.—The Montreal side, the same joint.

Mr. HOLGATE.—When you took hold of this joint on the Quebec side what first did you do? When you took your men to a joint that was bolted up and started to rivet it, you might describe to us the process, which plate you put on first, what bolts you loosened first and what ribs you riveted first?

Mr. BEAUVAIS.—The first thing there was a scaffold hung; that is we got a scaffold fixed so as to be safe; then we lowered the bottom cover plate down on the scaffold. Then we had two angles sent down, these were the inspector's orders, to place them where we got the bottom cover plates, these angles to act instead of the plates, two small angles. Then our first work was to tighten the bolts up. There were very few vacant holes. There were 280 holes altogether on the inside ribs; and then the inspector told me I should not take out more than 5 or 6 bolts at a time, and then drive these holes, and then take 5 or 6 more bolts out. The first thing we drove was the two inside ribs. The inside rib holes were $\frac{3}{4}$ -inch holes and the outside 1-inch holes.

Prof. GALBRAITH.—How many holes in one rib?

Mr. BEAUVAIS.—In each rib 140, on each rib, 140 holes. It was about this second day, and another man who is living yet saw the ribs bending with me.

Mr. HOLGATE.—Then you riveted up the bottom chord?

Mr. BEAUVAIS.—No, I had to rivet the top plate first so I could get at the bottom easier, and after we got the bottom plate on we put on the top.

Mr. HOLGATE.—And the riveting of the bottom plate was the last thing?

Mr. BEAUVAIS.—No, because there was these bottom laterals, they were the last plates we had to drive.

Mr. HOLGATE.—The bottom lateral bracing?

Mr. BEAUVAIS.—Yes.

Prof. GALBRAITH.—First of all, I understand you tighten up the bolts, have them all tight and filled before you begin any riveting; then you proceed to take out the bolts in the top cover plate and rivet them first; after that you take out the bolts in the two inside ribs, working from the bottom, and rivet them; then you rivet the two outside ribs, then you put on the bottom cover plate and rivet it. Is that the order of riveting?

SESSIONAL PAPER No. 154

Mr. BEAUVAIS.—I did not say I drove the cover plate first, the inside ribs first.

Prof. GALBRAITH.—You rivet them first!

Mr. BEAUVAIS.—Two of them; then the outside ribs, then the top cover plate. Of course I had to leave that to the last.

Prof. GALBRAITH.—And then the bottom cover plate!

Mr. BEAUVAIS.—Yes, and the last is the laterals.

Prof. GALBRAITH.—After the top cover plate the bottom cover plate!

Mr. BEAUVAIS.—Yes.

Prof. GALBRAITH.—And then the laterals going across to the other side of the bridge!

Mr. BEAUVAIS.—Yes, diagonally like, wind bracing I think they call it.

Prof. GALBRAITH.—Or laterals, anyway!

Mr. BEAUVAIS.—Yes.

Mr. HOLGATE.—Then when the laterals were all riveted up that joint was complete!

Mr. BEAUVAIS.—Yes. The inspector passed over, and he had two or three to cut out, we drove them back again and moved to the Montreal side.

Mr. HOLGATE.—Who was the inspector!

Mr. BEAUVAIS.—Mr. Kinloch.

Mr. HOLGATE.—I suppose he visited you pretty often, did he! He saw you pretty often at work!

Mr. BEAUVAIS.—He was always on the job, yes, sir. I very often seen him on the job, most of the time.

Mr. HOLGATE.—Now, I think we can pass over to the joint on the Montreal side. That is where you moved to after you left the joint on the Quebec side!

Mr. BEAUVAIS.—Yes, sir.

Mr. HOLGATE.—In what condition did you find that joint when you went to it, as to bolts! Was it bolted up the same as the one on the Quebec side!

Mr. BEAUVAIS.—No, it was very bad, because I am sure there were not more than 22 or 25 $\frac{3}{4}$ bolts in there. These two inside ribs, they were all $\frac{3}{4}$ inside, most of them.

Prof. GALBRAITH.—In the two inside!

Mr. BEAUVAIS.—In the two inside. That makes 280, 140 in each.

Prof. GALBRAITH.—Mostly $\frac{3}{4}$.

Mr. BEAUVAIS.—Mostly, there was not more than 22 to 25, that is all the $\frac{3}{4}$ bolts in that.

Prof. GALBRAITH.—Did you find the bolts tight!

Mr. BEAUVAIS.—No, it is very seldom you find a bolt tight by the erectors putting them in, they just screw them in and leave them.

Mr. HOLGATE.—Was there any reason for putting in the $\frac{3}{4}$!

Mr. BEAUVAIS.—Nothing. Sometimes at first we had to pass a reamer for the reason that they were bad holes, but as the work went on the holes were getting good all the time, springing in like. I suppose it was that reason, I could not say, it might have been bad holes.

Mr. HOLGATE.—When you found that condition, what did you do, put in more bolts!

Mr. BEAUVAIS.—I had to go up and there were bolt boys, we call them, five or six, on the shore, firing bolts, oiling them. I told Benny and he ordered the boy to fetch me a big box of $\frac{3}{4}$ bolts, and it was impossible to drive the $\frac{3}{4}$ because they would not drive tight enough.

Mr. HOLGATE.—Was there any trouble in getting the $\frac{3}{4}$ bolts in!

Mr. BEAUVAIS.—Not at all, because there were good holes and room enough.

Mr. HOLGATE.—Room enough!

Mr. BEAUVAIS.—Room enough to work, they were good holes.

Mr. HOLGATE.—So it might have been possible to change the $\frac{3}{4}$ bolts for $\frac{3}{4}$ bolts before you got to the joint!

7-8 EDWARD VII., A. 1908

Mr. BEAUVAIS.—Yes, I do not know how long before they could have been changed. At that very same point I saw three extra plates that were mended. I worked on the same joint and I saw three extra plates that were mended. It was riveted and there were not more than five or six bolts in it. There were vacant holes. Two of these plates had from 35 to 40 bad holes, and one of them had only a single row of holes stripped.

Prof. GALBRAITH.—Were these left near the joint?

Mr. BEAUVAIS.—On the side of the joint; between the joint and the post.

Mr. HOLGATE.—Do you remember what day it was you went to start work on that joint?

Mr. BEAUVAIS.—I could not remember very well.

Mr. HOLGATE.—Was it that week?

Mr. BEAUVAIS.—It must have been four days before the accident. There was one Sunday between. I would not swear what day I got there.

Mr. HOLGATE.—What progress had you made with the riveting work?

Mr. BEAUVAIS.—This time I riveted the bottom lateral first before I went on this joint.

Mr. HOLGATE.—Had you any particular reason for doing that?

Mr. BEAUVAIS.—For driving the lateral first?

Mr. HOLGATE.—Yes.

Mr. BEAUVAIS.—Because there were only two of these machines that worked inside the chord on the job and they were both busy at the time. There was another gang working on the anchor arm. Of course, I had to do something else until the machine got back.

Mr. HOLGATE.—You riveted up the bottom lateral. What was the next step?

Mr. BEAUVAIS.—The next step was to go down the scaffold and put more lines on it for safety, and unload the plates on the scaffold. The next was to change these $\frac{3}{8}$ bolts.

Mr. HOLGATE.—When you lowered that plate on the scaffold, did you put on your angles?

Mr. BEAUVAIS.—I certainly did, because the inspector is always watching us for that.

Prof. GALBRAITH.—I want to make quite sure which diagonal he means.

Mr. BEAUVAIS.—It is the bottom lateral which goes from panel point No. 10 to the shoe.

Mr. HOLGATE.—You lowered your plate and put on the angles?

Mr. BEAUVAIS.—Put on the angles. The inspector is watching us pretty sharp. Then I found these $\frac{3}{8}$ bolts in there and the vacant holes. I had to go up and tell Mr. Yenser about that and he ordered them to send a boy to bring me down $\frac{3}{8}$ bolts instead of the $\frac{1}{2}$ bolts.

Prof. GALBRAITH.—Which side is he speaking of now?

Mr. BEAUVAIS.—The Montreal side.

Mr. HOLGATE.—And you put in as many $\frac{3}{8}$ bolts as you could?

Mr. BEAUVAIS.—Yes, as many as necessary to have the plate come up tight. We had about three-quarters or more bolts in there and left the quarter of the holes vacant and then started to drive the rivets. There were some bad holes—a very few—that we had to ream before we could get the rivets into them.

Prof. GALBRAITH.—Were these plates riveted in the shop on one side of the joint or had you to rivet them on both sides of the joint?

Mr. BEAUVAIS.—We had to rivet them on both sides of the joint. We had to fill them.

Mr. HOLGATE.—Then you continued your riveting?

Mr. BEAUVAIS.—In the same way as on the Quebec side—the inside rivets first.

Mr. HOLGATE.—Had you completed the riveting of the inside rivets?

Mr. BEAUVAIS.—Only 13 or 14 holes were driven on the two inside ribs.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—How much had you done on the outside work?

Mr. BEAUVAIS.—Nothing at all, because I was supposed to get through with the inside before touching the outside at all.

Mr. HOLGATE.—But the outside ribs were all pretty securely bolted up at that time?

Mr. BEAUVAIS.—They were bolted up good—inch bolts and very few seven-eighths.

Mr. HOLGATE.—And the bottom plate, of course, was off?

Mr. BEAUVAIS.—It was off and the top plate—the inspector came down the very morning the accident took place and looked at the top plate. It was off three-quarters of an inch or an inch. It was kicking up like because it was not bolted. We had to put drift pins in every hole; they were not bolted, only on the end there were eight bolts where you could reach with the hand.

Prof. GALBRAITH.—But the top plate was not lying close to the ribs?

Mr. BEAUVAIS.—It was not lying right down to the chord. It was off half an inch, or three-quarters or perhaps more.

Prof. GALBRAITH.—At which end?

Mr. BEAUVAIS.—At the cuter end, towards the anchor pier.

Mr. HOLGATE.—Did you have any difficulty in putting on the bottom angles? Did these holes come even?

Mr. BEAUVAIS.—It came right because we put it right down before starting in. But this powerful gun jarred the chords. You could feel the jar of the chords. There is where I found two rivets broken out right near the splice. They broke out about half an hour before the accident took place.

Mr. HOLGATE.—It broke the rivets you had driven?

Mr. BEAUVAIS.—These were two rivets in the same place.

Mr. HOLGATE.—Were both rivets broken in the same holes?

Mr. BEAUVAIS.—Five or six inches apart.

Mr. HOLGATE.—They were in separate holes?

Mr. BEAUVAIS.—Yes, next to each other.

Mr. HOLGATE.—Were they inch rivets?

Mr. BEAUVAIS.—No, seven-eighth rivets.

Prof. GALBRAITH.—How long after they were put in did you find them broken?

Mr. BEAUVAIS.—I drove them the same hour. It was not I who found them broken off. It was my partner who found them first.

Prof. GALBRAITH.—What is his name?

Mr. BEAUVAIS.—John Norton.

Mr. HOLGATE.—Did he survive?

Mr. BEAUVAIS.—No, he is gone.

Prof. KERRY.—How were they broken off?

Mr. BEAUVAIS.—He pulled it out and showed it to me and said, 'Look here.' He said, 'I found it off a quarter of an inch.' I asked, 'How did you take it out,' and he said, 'it was off almost a quarter of an inch and I pulled it out.' It was broken almost in the centre.

Mr. HOLGATE.—Can you account for these two particular rivets being broken? There were other rivets that may have been strained in the same way; why should not they have broken?

Mr. BEAUVAIS.—Of course, I did not test them. If I had I would know just exactly what was broken and what was not, but while I was driving two or three other rivets, after that I found the first one broken off. He said, 'There is another one broken,' and I tested it with a drift pin and it was broken off straight. You could turn the one end and the other end would be still. It was impossible to pull it out because it was plugged in there. There were two rivets broken. I called Mr. Meredith, the rivet boss, and also to see that the ribs were bending in. He looked down there and told me that it was not any worse than the others. He did not think it serious.

7-8 EDWARD VII., A. 1908

Prof. GALBRAITH.—The ribs were bending in?

Mr. BEAUVAIS.—Yes.

Prof. KERRY.—At what time did Meredith come down?

Mr. BEAUVAIS.—He was not more than seven or ten minutes gone up before the accident.

Mr. HOLGATE.—What called your attention to the ribs bent in? You mean by that that they were coming closely together at the joint?

Mr. BEAUVAIS.—They were going out to the Montreal side. They were both going the same way—these two ribs.

Mr. HOLGATE.—Which ribs?

Mr. BEAUVAIS.—The inside ribs.

Mr. HOLGATE.—Both moving towards Montreal?

Mr. BEAUVAIS.—Yes, the Montreal side. At the same time he was down there I showed him about that extra plate which was mended and there were very bad holes and you could hardly get the bolts out. They must have been put in after the other holes were punched.

Mr. HOLGATE.—The extra joint plate?

Mr. BEAUVAIS.—The extra joint plate, between the splice and the post. That can be seen yet because it is inside the pier.

Prof. KERRY.—That extra plate was on the inside of the inside ribs?

Mr. BEAUVAIS.—There was one on the inside ribs and one on the outside ribs. That was a long plate in the same direction as the bottom cover plate. There was only one row of bolts in the one on the inside, and there were 35 or 40 bolts on the one on the outside, and there were just enough bolts to hold the plates on.

Mr. HOLGATE.—Now you are referring to what you said before of the extra plate where that chord was mended?

Mr. BEAUVAIS.—Yes, sir.

Prof. KERRY.—You can see that on the ground because that joint is perfect.

Mr. BEAUVAIS.—Yes, you can find that yet. I did not see anything removed but it was extra altogether. This chord in No. 5 panel on the Montreal side is bent very close together—right in the centre—right between the two posts.

Prof. GALBRAITH.—The centre ribs come together?

Mr. BEAUVAIS.—Yes. That is on the Montreal side, and I believe Mr. John Williams saw that. They go up or down beyond that to the traveller, and you cannot help seeing it.

Prof. GALBRAITH.—That is about half way between the panel points?

Mr. BEAUVAIS.—Yes, on panel No. 9, Montreal side.

Prof. KERRY.—How much was it bent?

Mr. BEAUVAIS.—I did not measure, but I am sure an inch or an inch and a quarter.

Prof. GALBRAITH.—Bent in?

Mr. BEAUVAIS.—Yes.

Prof. GALBRAITH.—Towards each other?

Mr. BEAUVAIS.—Yes.

Prof. GALBRAITH.—Each an inch and a quarter?

Mr. BEAUVAIS.—A space about that.

Mr. HOLGATE.—Would not that have shown on the lacing?

Mr. BEAUVAIS.—I did not investigate that enough to say about the lacing. I know that a day or two before the accident happened Mr. Birks and Mr. Yenser were there examining it on the Montreal side. They were there for an hour or perhaps more.

Prof. KERRY.—How long was the bend?

Mr. BEAUVAIS.—It was almost the whole length.

Mr. HOLGATE.—Was there anything noticeable on the outside ribs?

Mr. BEAUVAIS.—On the outside ribs you could not see as well if it had bent because it is wider than the inside ribs, but in these inside ribs it was not more than two inches apart. You could see it easily where it was close together.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—Were they close together ?

Mr. BEAUVAIS.—Almost that close, more than an inch.

Prof. GALBRAITH.—They were not more than two inches apart ?

Mr. BEAUVAIS.—They cannot be more than two inches apart.

Prof. GALBRAITH.—Did you notice between them and the outer ribs that the space was wider than it was originally ?

Mr. BEAUVAIS.—I could not very well notice it unless you measured it because the space is too wide ; it is something like 15½ inches. An inch or three-quarters of an inch would not show much out unless you measured it.

Mr. HOLGATE.—Did you have any conversation with Mr. Birks or Mr. Yenser when they were down there ?

Mr. BEAUVAIS.—No, nothing at all ; only, Mr. Yenser told me not to take out more than five or six bolts at a time. I heard him say that once.

Mr. HOLGATE.—That was on what day ?

Mr. BEAUVAIS.—It was about a day or two before the accident happened.

Prof. KERRY.—Did you look at the joint at the other end of the chord ?

Mr. BEAUVAIS.—I did not. I could see it there. There were bolts in there.

Prof. KERRY.—It was not riveted ?

Mr. BEAUVAIS.—No.

Mr. HOLGATE.—The joint between 8 and 9 was riveted ? The joint between 9 and 10 is where he was working and now then he is referring to the joint at chord 10 with the stub chord down near the shoe. That was not riveted ?

Mr. BEAUVAIS.—That was bolted.

Mr. HOLGATE.—Was it fully bolted ?

Mr. BEAUVAIS.—I could not say, because I did not look sharp enough at it.

Prof. GALBRAITH.—Which side ?

Mr. BEAUVAIS.—On the Montreal side.

Mr. HOLGATE.—Having got to the point where you saw these two or more rivets broken, do you recollect anything between that and the collapse of the bridge ?

Mr. BEAUVAIS.—I guess not. I was driving rivets, and I was about to shoot another rivet when the crash came down.

Mr. HOLGATE.—When it came have you any recollection of how this point which you were working at acted ? What took place in that joint ?

Mr. BEAUVAIS.—When it fell ?

Mr. HOLGATE.—Did it fall ?

Mr. BEAUVAIS.—I did not see how it fell.

Mr. HOLGATE.—You were right inside ?

Mr. BEAUVAIS.—Right inside. I was right inside the chord, and I had to come out underneath because I had to pry the plate off. As soon as I felt it break I made a grab for the plate. I had my arm on the plate. I just turned my hand out and caught the plate. There was a space of an inch and a half and I got my hand in it. At the same time I let my machine drop. When this chord landed it did not land on the ground. It stood three or four feet in the air. I held on to the chord and never touched the ground.

Mr. HOLGATE.—You were in what chord ?

Mr. BEAUVAIS.—No. 10, Montreal side. As soon as everything was still I came out. It was easy to stay there because I was tight in there. I had one leg broken and my nose was broken.

Mr. HOLGATE.—I fancy being inside the chord saved you ?

Mr. BEAUVAIS.—I guess it did. I put my left foot outside the chord and my right foot in the chord.

Mr. HOLGATE.—Could you say where you first rose up at that point ?

Mr. BEAUVAIS.—That is something I could not say. I could feel it drop like. I made a grab for the plate, I let the machine drop and I never felt this foot broken. It happened so quickly.

7-8 EDWARD VII., A. 1908

Mr. HOLGATE.—But the first sensation you had was of falling?

Mr. BEAUVAIS.—Yes, the first thing I felt was the falling, the dropping.

Mr. HOLGATE.—Was there any preliminary cracking or breaking noise around before that?

Mr. BEAUVAIS.—There was very little noise I heard. I heard no crack before it dropped. Of course, you could not hear much from the outside, where I was. I was right inside the chord.

Prof. GALBRAITH.—You are sure that the splices between 8 and 9, on both sides, were riveted up at that time?

Mr. BEAUVAIS.—Yes.

Mr. HOLGATE.—And that the one on the Quebec side between 9 and 10 was riveted up?

Mr. BEAUVAIS.—Yes.

Mr. HOLGATE.—And that the bending together of the two inside ribs was on chord No. 9?

Mr. BEAUVAIS.—On chord No. 9, Montreal side.

Mr. HOLGATE.—That was the most prominent part of the chord, and you cannot say that you noticed the same bending on the outside ribs?

Mr. BEAUVAIS.—Yes.

Prof. GALBRAITH.—How about the bending of chord No. 9 on the other side?

Mr. BEAUVAIS.—I could not say about the Quebec side. I passed very often while I was working on the Quebec side.

Prof. GALBRAITH.—You did not notice the bending?

Mr. BEAUVAIS.—I never noticed it.

Mr. HOLGATE.—What do you think now may have been the cause of those few rivets breaking out so soon after they were driven and so soon before the accident?

Mr. BEAUVAIS.—Any bridgeman can tell you that. The splice was like this (indicating with his hands). There are about four inches of plates there, and this outside plate here is not so thick; it would be perhaps one half or three-quarters of an inch in thickness; when the strain came it would be three or four inches over the joint. This is a powerful gun, and the jarring was so great that you could feel it under your feet.

Mr. HOLGATE.—Had you anything like that occur at any other point when you were riveting it up?

Mr. BEAUVAIS.—Yes, sometimes on account of a burnt rivet.

Mr. HOLGATE.—Was the breaking of these two or three rivets unusual? Were they good rivets?

Mr. BEAUVAIS.—I saw nothing wrong about them.

Mr. HOLGATE.—In fact, you thought it was so curious that you asked Meredith to come down and look at it?

Mr. BEAUVAIS.—It was not only for that, but it was for two things. It was to show him these bad holes and these rivets broken out. He did not think them very serious. He said that he had seen worse than that before. They were bending out towards Montreal right at the joint.

Prof. KERRY.—Do you think that it was that bending that made the joint plate break the rivets?

Mr. BEAUVAIS.—Yes, because you could see that come off very near an eighth of an inch. It was pretty near three-quarters of an inch, and it came off very near one-eighth of an inch. You could see it just very near the joint. The plate was off perhaps one-eighth of an inch.

Prof. KERRY.—You had drawn it up tight when you started to rivet with the bolts?

Mr. BEAUVAIS.—Yes, because it would not be easy driving without drawing them up tight.

Prof. KERRY.—So that during the time you were working that gap of one-eighth of an inch opened up?

SESSIONAL PAPER No. 154

Mr. BEAUVAIS.—It worked itself off. This bend went towards Montreal and this splice plate was on this side. It came off about one-eighth of an inch right below where these two rivets broke.

Prof. KERRY.—Right at the line of the splice ?

Mr. BEAUVAIS.—Yes.

Mr. HOLGATE.—Then the ends of the chords were not square opposite each other ?

Mr. BEAUVAIS.—They were brought up pretty near and pretty square-faced and it was down, maybe, a quarter of an inch.

Mr. HOLGATE.—No 10 ?

Mr. BEAUVAIS.—The lower chord was lower than the upper chord maybe one-quarter of an inch at the time I saw these two rivets broke.

Prof. KERRY.—The ribs lined up well but No. 10 was lower than the other.

Prof. GALBRAITH.—How did you match the holes ?

Mr. BEAUVAIS.—The holes were not so bad but we had to pin them. The holes were matched before we drove. At the start we had to pin almost every hole, while at the last there were very few holes we had to pin.

Prof. GALBRAITH.—Did the holes match when the end of No. 10 was a quarter of an inch below No. 9 ?

Mr. BEAUVAIS.—I should say they matched. But there were some holes we had to pin. Of course, it did not go down much. It might be less than a quarter of an inch.

Mr. HOLGATE.—What would resist that bend at the joint towards Montreal ? Would not the lateral bracing hold that in place to some extent ?

Mr. BEAUVAIS.—The lateral was not so close. The lateral from the strut comes right outside the post. This splice is 7 or 8 feet below it.

Mr. HOLGATE.—Now, Mr. Beauvais, were there any other places on the lower chords that you noticed bending ?

Mr. BEAUVAIS.—No. I only heard of it but did not see it personally.

Mr. HOLGATE.—But others spoke to you about it ?

Mr. BEAUVAIS.—Yes.

Mr. HOLGATE.—On that occasion did you understand that they had seen the bends ?

Mr. BEAUVAIS.—Yes, it was this gang using the same kind of a gun I was using that was working on the bottom chord that spoke to me about it. They were stopping at the same house I was stopping.

Mr. HOLGATE.—Were there more than two guns of that size ?

Mr. BEAUVAIS.—Only two.

Mr. HOLGATE.—Was all the riveting done on the chord joints done with the big gun ?

Mr. BEAUVAIS.—You could only use these two on the inside rivets. On the outside rivets you could use ordinary guns.

Prof. KERRY.—Where were that gang working when they spoke to you about the other bend ?

Mr. BEAUVAIS.—The gang I am speaking of worked right on the lower chord of the cantilever arm on both sides from the main pier outwards to the 6th panel. I do not say at which joint they said the chord was bent.

Mr. HOLGATE.—Did the work seem to go on pretty well on the bridge ?

Mr. BEAUVAIS.—Yes, everything seemed to go off well; in fact we only lost one man before that this season. That was Joseph Ward.

Prof. GALBRAITH.—He fell off ?

Mr. BEAUVAIS.—Yes, on the 20th.

Mr. HOLGATE.—All the men in your gang lost their lives ?

Mr. BEAUVAIS.—Yes, except that John Williams. He left about six weeks before the accident. He got hurt on the leg and had to leave. He ought to have seen that No. 9 chord on the Montreal side was bent. Of course, he never said anything about it, but he should have seen it because he travelled over it as well as I did.

Prof. GALBRAITH.—Is he alive ?

Mr. BEAUVAIS.—Yes.

Prof. KERRY.—What day did you see it bending ?

Mr. BEAUVAIS.—I could not say.

Prof. KERRY.—A week before the accident ?

Mr. BEAUVAIS.—Three or four days.

Mr. HOLGATE.—He said that he thought it was Tuesday.

Mr. BEAUVAIS.—While I was working on the Montreal side I was travelling on that Montreal side of the bridge all the time when I was going home or going to dinner. When I worked on the Quebec side of course I always travelled on the Quebec side along the chord.

Prof. GALBRAITH.—What other lower chord joints were not riveted at the time of the accident in the anchor arm ?

Mr. BEAUVAIS.—Except the stubs both sides were not riveted. There was another gang which had been driving here, and I believe they were almost completed.

Prof. GALBRAITH.—About chord No. 5 ?

Mr. BEAUVAIS.—I could not say which. I know there was another gang driving there.

Mr. HOLGATE.—Do you remember who was in charge of that gang ?

Mr. BEAUVAIS.—Napoleon LaHache.

Mr. HOLGATE.—Are they alive ?

Mr. BEAUVAIS.—They are all gone.

Mr. HOLGATE.—Is there anything else you think of, Mr. Beauvais, of interest, that you know of yourself ? I think you have already said that you have no knowledge of your own about any other chords being bent ?

Mr. BEAUVAIS.—No, not to my own knowledge.

Mr. HOLGATE.—Except what you heard ?

Mr. BEAUVAIS.—Oh, yes ; I guess everybody heard that, too.

Mr. HOLGATE.—Did you come in contact much with Mr. Yenser ? Did you have much to do with him ?

Mr. BEAUVAIS.—Hardly anything. Whenever I had anything to do with the foreman I had to go to my foreman, Meredith, and he was supposed to go to Mr. Yenser, but if I ever saw Mr. Yenser before I came to Meredith I talked to him instead of Meredith.

Mr. HOLGATE.—How did you find Mr. Yenser ?

Mr. BEAUVAIS.—He was the right man, I suppose. I could not see anything wrong about him. The level bracing connecting at panel point No. 9 on the inner arm was not riveted on either side. It was full of bad holes. Most of them were blind holes in each side. There were no bolts in it at all. They were just lying there.

Mr. HOLGATE.—No connection whatever ?

Mr. BEAUVAIS.—No, they were blind holes, most of them.

Prof. GALBRAITH.—Do you know anything about the riveting in this long diagonal next the centre post marked on the plan T-5 and T-50 ?

Mr. BEAUVAIS.—I drove those myself.

Mr. GALBRAITH.—Was that riveting finished ?

Mr. BEAUVAIS.—Yes, we finished on top before we came down. I started there and went up to the last post and I was ordered to come down to the bottom chord.

Prof. GALBRAITH.—What about the riveting of the centre post ?

Mr. BEAUVAIS.—I could not say how much riveting there was done at that. I am pretty sure it was almost completed, though.

Prof. GALBRAITH.—If you have anything more to say that you think would be of use you might say it now.

Mr. BEAUVAIS.—There is only one thing—I do not know whether it is important or not. It was last summer. I am sure it was not less than 15 inches in length. It was about that wide (indicating)—almost semi-circular. It was broke off the main

SESSIONAL PAPER No. 154

post. It was almost at the shoe. We attempted to straighten that with the jack. It was cracked and bent right off and we had to send it to the blacksmith shop to get it straightened and put it back there with another plate.

Prof. GALBRAITH.—Is that the chord plate?

Mr. BEAUVAIS.—It was one of the webs of the main post—the angle web. That angle must have been 6 inches wide.

Prof. KERRY.—That was the piece right above the angle?

Mr. BEAUVAIS.—Yes, semi-circular; it came that way (indicating).

Mr. HOLGATE.—How did it get broken?

Mr. BEAUVAIS.—It was bent, and we were sent down there to straighten it out with the jack. We jacked it up and it broke right out. The piece came right out.

Mr. HOLGATE.—Did it fly out?

Mr. BEAUVAIS.—It did not fall off altogether, but it was split away open. It would have been easy to knock it out with a hammer.

Mr. HOLGATE.—Which side of the bridge was that?

Mr. BEAUVAIS.—On the Quebec side and on the Quebec side of the post, too.

Prof. KERRY.—How far above the shoe?

Mr. BEAUVAIS.—Ten or twelve feet.

Prof. KERRY.—It would be in the first section of the post right above the shoe?

Mr. BEAUVAIS.—Yes. We had to send that to the blacksmith shop to straighten it and we placed it back in position again and then another plate was put on—a patch.

Mr. HOLGATE.—It was a good solid patch that was put on?

Mr. BEAUVAIS.—I could not say what thickness it was.

Mr. HOLGATE.—You worked on it yourself?

Mr. BEAUVAIS.—Yes, sir, I helped to drill the holes in it.

Witness discharged.

Mr. HOLGATE, Chairman of the Commission, interviewed Oscar Lebarge, at his residence near the bridge.

OSCAR LEBARGE, SWORN.

Mr. HOLGATE.—You are employed by the Phenix Bridge Company?

Mr. LEBARGE.—Yes.

Mr. HOLGATE.—When did you start work on the Quebec bridge?

Mr. LEBARGE.—April, 1905.

Mr. HOLGATE.—What kind of work were you doing?

Mr. LEBARGE.—Everything. I worked all over the bridge.

Mr. HOLGATE.—In 1907, that is this season, what part of the bridge were you working at?

Mr. LEBARGE.—On the top of the big traveller.

Mr. HOLGATE.—Is that where Mr. Hall was working?

Mr. LEBARGE.—Yes.

Mr. HOLGATE.—You were working both together?

Mr. LEBARGE.—No, he was working on one side and we were working on the other. We worked together sometimes, but that time, when it fell, we were not together.

Mr. HOLGATE.—You were working on August 29 when the accident happened?

Mr. LEBARGE.—Yes.

Mr. HOLGATE.—Had you any warning of that accident at all?

Mr. LEBARGE.—I did not see it. I heard some fellow say the chord was bent, but I asked the foreman, and he said, 'Oh, no.'

Mr. HOLGATE.—Was there anything that happened that afternoon on the bridge at the traveller that caused you to feel insecure?

Mr. LEBARGE.—No.

7-8 EDWARD VII., A. 1908

Mr. HOLGATE.—Was there any swaying that you felt?

Mr. LEBARGE.—No.

Mr. HOLGATE.—Or any up and down motion that you felt?

Mr. LEBARGE.—Sometimes a slight motion like that (indicating), but I never paid any attention to it.

Mr. HOLGATE.—You did not think it any worse that day than any other day?

Mr. LEBARGE.—No.

Mr. HOLGATE.—I suppose when the bridge fell that is all you know about it, that you simply had to try and look out for yourself?

Mr. LEBARGE.—Yes.

Mr. HOLGATE.—You spoke just now of hearing about the chords. Did you ever have a chance to look at these chords yourself?

Mr. LEBARGE.—No, I never went to see it. I was working there on top of the big traveller when they put the big chord in.

Mr. HOLGATE.—Were you ever working with the rivetters?

Mr. LEBARGE.—Yes, I worked this spring with the rivetters.

Mr. HOLGATE.—Whereabouts?

Mr. LEBARGE.—On the third panel, I guess.

Mr. HOLGATE.—In the cantilever arm?

Mr. LEBARGE.—No, I do not know, I did not work there, I am not very sure, I do not think I worked on the cantilever arm, I worked on the anchor arm.

Mr. HOLGATE.—Was it on the posts or chords?

Mr. LEBARGE.—I worked on the posts, and I put some plates on the bottom chords and on the laterals, the bottom laterals.

Mr. HOLGATE.—Can you remember about what time you were working at the riveting, just in the month, say?

Mr. LEBARGE.—It was in April, April and May I was working there.

Mr. HOLGATE.—Can you recollect which chords you were working on?

Mr. LEBARGE.—No.

Mr. HOLGATE.—Were they near the main pier, that is the cantilever pier; did you work on any joints close to that?

Mr. LEBARGE.—Yes, I worked on one of the joints there one day, straight in there (indicating), that is in May. A fellow named Johnson and myself, the first strut down next the pier on the anchor arm, on the Montreal side.

Mr. HOLGATE.—The horizontal strut at panel point 9?

Mr. LEBARGE.—Yes.

Mr. HOLGATE.—And you completed the joints at the intersection of the horizontal strut with the next post? Do you remember if that horizontal strut, this one here, was riveted up, the 9th panel point?

Mr. LEBARGE.—It was not then. At that time that strut in here was loose. It was connected, and then this one we could not connect, it was a little below.

Mr. HOLGATE.—Did you rivet that up later?

Mr. LEBARGE.—I do not know if he did rivet it.

Mr. HOLGATE.—You do not remember that the horizontal strut was riveted up on the 9th panel point? Can you recollect anything about the chords down on the anchor arm, from the pier up this way? Did you ever notice that particularly?

Mr. LEBARGE.—No, I never did.

Mr. HOLGATE.—Did you hear anything about that; was your attention called in any way to them?

Mr. LEBARGE.—I heard that a piece of the chord in there was bent, and I went to a fellow, Aderholdt—I was working for him—and I asked him, I said: 'Do you see that chord in there.' He says: 'Yes, that was bent when they put it in there.' He says: 'Don't you remember all the trouble they had to put it in?' I said 'No, I was not working then.' I do not think I was working, I did not work in the gang most

SESSIONAL PAPER No. 154

of the time, I was working on top of the traveller. This spring I worked on top of the traveller, doing the rigging.

Mr. HOLGATE.—Mr. Aderholdt did not mention what chord it was?

Mr. LEBARGE.—No, he never did. He told me it was a chord that was bent when they put it in. I did not ask what number it was; he said it was bent; he said they had all kinds of trouble to connect it when they did put it in.

Mr. HOLGATE.—Was he your foreman?

Mr. LEBARGE.—Yes, he was my pusher, we call him. These fellows get more money than we do; they get 7½c. more than we do by the union.

Mr. HOLGATE.—Did you know Yenser?

Mr. LEBARGE.—Yes, I know him; I worked with him on two different jobs; I worked here and I worked last winter, too.

Mr. HOLGATE.—Was he a pretty careful man on work?

Mr. LEBARGE.—He did some good work and sometimes he got excited, sometimes he got pretty good ideas, too.

Mr. HOLGATE.—How about the tackle that you used on the traveller, was that all right, the hoisting rigging?

Mr. LEBARGE.—Oh, yes, that was first-class rigging in there.

Mr. HOLGATE.—Did anything ever go wrong with that?

Mr. LEBARGE.—No, we never broke anything; but a man got hurt by that rigging on top of the traveller.

Mr. HOLGATE.—It was always strong and heavy enough to do the work.

Mr. LEBARGE.—Yes, always good and strong, and kept in good order; everything first-class.

Mr. HOLGATE.—Did they follow up the riveting on the anchor arm as fast as they might have done? Did the riveting gangs follow up the erection as fast as they might have done?

Mr. LEBARGE.—I do not know as to that. They kept a pretty good gang of riveters driving right along this year; I cannot tell. They kept good bolts and everything; when they raised the iron they kept it bolted up pretty good; they bolted it up 50 per cent every place they put a piece on, you know. Some places they put bolts every hole.

Mr. HOLGATE.—Would you say that they were reasonably careful about doing all that kind of work?

Mr. LEBARGE.—I cannot tell that. They were good and careful in raising the iron and everything, but I do not know enough, on a big job like that, to know if they are taking care of what is going on behind. They were good and careful in front in raising the iron.

Mr. HOLGATE.—Did you see much of Mr. Kinloch on the work?

Mr. LEBARGE.—Oh, yes, Mr. Kinloch was standing there all the time.

Mr. HOLGATE.—Every place?

Mr. LEBARGE.—Oh, yes, he kept around there near every place. Yes, he knew; he had pretty good experience on other work.

Mr. HOLGATE.—And Mr. Birks?

Mr. LEBARGE.—Yes, Mr. Birks was there all the time; every time they raised a big piece like the tower Mr. Birks would go all around the traveller to see if everything was tight and safe.

Mr. HOLGATE.—When the bridge fell did it go down straight?

Mr. LEBARGE.—It went down for a piece, as far as I remember it went right down, and it kind of stopped then, and I do not know which way it went, because I left the position I was in; I remember I was going down, I was in the air, I was not holding anything, just holding a piece of timber. When it started I went right down, right straight down for maybe 75 feet, somewhere like that.

Mr. HOLGATE.—Were you on top of the traveller?

Mr. LEBARGE.—On top of the big traveller, standing up. When it started to go down, there were three pieces of timber 10 x 12 x 88 feet, and I was standing on two

of them, and it started to go down. I just touched the timber, my feet just lightly touched the top of the timber. The balance, the iron, was going faster than the timber, and the timber was going about the same as I was and I was just touching them, so I could not lay down to catch it because I was going too fast, and I was standing up, and when we were down 75 or 100 feet, I kind of stopped, so I remember my feet caught the timber, and as I was going down I had my arm around one of those pieces of timber. I remember I was in the water. When I hit the water I do not know where I hit or anything like that.

Mr. HOLOATE.—Did you manage to get out yourself or were you knocked senseless?

Mr. LEBARGE.—As soon as I hit the water, I got myself and I swam and caught up to some timber and I held on to it, and then I got into a skiff, there was a fellow there and he lifted my leg in and took me to the shore.

Witness discharged.

Prof. GALBRAITH and Prof. KERRY visited the house of Mr. Charles Davis, New Liverpool, and took his evidence.

Mr. DAVIS being sworn.

Prof. KERRY.—Where were you working on the bridge?

Mr. DAVIS.—I was right at the front, sir, right out on the end of it.

Prof. KERRY.—On what they call the little traveller?

Mr. DAVIS.—I was out on the last section.

Prof. KERRY.—Had you been with the company long?

Mr. DAVIS.—I worked all last summer with them.

Prof. KERRY.—1906 and 1907?

Mr. DAVIS.—Yes.

Prof. KERRY.—Where were you when the bridge went down?

Mr. DAVIS.—I was right out on the end. They had just put the section of the bottom chord in.

Prof. KERRY.—Tell us what you know about the bridge when it went down. Did you have time to notice anything?

Mr. DAVIS.—Not at that time. I heard a crash, something go away back on the bridge, and I felt it sink.

Prof. KERRY.—It went straight under your feet?

Mr. DAVIS.—Just straight down, sir.

Prof. KERRY.—You do not know anything more till after you got in the water?

Mr. DAVIS.—I do not remember anything striking me at all, but something must have with the injury I received on my back and hip.

Prof. KERRY.—You could not have got down without some of the wreckage striking you?

Mr. DAVIS.—No.

Prof. KERRY.—So that all you recollect is just that the bridge went down underneath you?

Prof. GALBRAITH.—Did it go very fast or very slow?

Mr. DAVIS.—Slow at first.

Prof. GALBRAITH.—Until it struck the water?

Mr. DAVIS.—It left me, sir. I was in space, in the air. It travelled a great deal quicker than I did.

Prof. GALBRAITH.—So that you struck only the water; you did not strike pieces of the bridge nor the beach?

Mr. DAVIS.—No. If the traveller had come down behind me it would have struck me. I stood on a section of the bottom chord when it started to go, I looked down and a good many thoughts were going through my mind. When it left me I was in space. It travelled a great deal quicker than I did.

SESSIONAL PAPER No. 154

Prof. KERRY.—You were working as an erector ?

Mr. DAVIS.—Yes, sir.

Prof. KERRY.—Had you any reason to think that there was anything wrong with the bridge ?

Mr. DAVIS.—I heard them talking every day. A great many of the men thought the chord was buckling.

Prof. KERRY.—You did not have a chance to look at it yourself ?

Mr. DAVIS.—I was driving rivets the day before the accident and on the splice lower down, next to where we were on the cantilever arm the jacks were in position to jack the webs which were buckling. Mr. Yenser and Meredith, the riveter foreman, had been down looking at it. When they went away I wondered what was wrong, seeing the jacks in between the webs.

Prof. KERRY.—That would be how many joints away from the pier ?

Mr. DAVIS.—Five or six, I should say—six or seven. I could hardly say now.

Prof. KERRY.—That is on the—

Mr. DAVIS.—Quebec side.

Prof. KERRY.—They had the jacks in between the webs trying to straighten them up ?

Mr. DAVIS.—To straighten them out.

Prof. KERRY.—That was just because they did not line up truly ?

Mr. DAVIS.—Yes, I expect so.

Prof. KERRY.—So that you could not get the plate on right ?

Mr. DAVIS.—Yes, sir.

Prof. KERRY.—That was the only thing you saw yourself ?

Mr. DAVIS.—I had seen the cracking of the plate on the shoe.

Prof. KERRY.—Did you see that ?

Mr. DAVIS.—Yes.

Prof. KERRY.—Which plate was that ?

Mr. DAVIS.—It would be the plate connected with the portal strut and bottom chord that is connected into the shoe. I really do not think that it would be any cause at all of the disaster.

Prof. KERRY.—That is a big flat plate ?

Mr. DAVIS.—Yes.

Prof. KERRY.—Which is just shaped to a V ?

Mr. DAVIS.—Fastened to the shoe, and diagonally running across.

Prof. KERRY.—Where was that cracked ?

Mr. DAVIS.—Just alongside of the bottom chord—the chord connecting with the shoe.

Prof. KERRY.—A chord on the anchor arm ?

Mr. DAVIS.—Yes. That would be on the Montreal side.

Prof. KERRY.—What sort of a crack was it ?

Mr. DAVIS.—About 18 inches to 2 feet, I would say.

Prof. GALBRAITH.—Could you see daylight through it ?

Mr. DAVIS.—I could not say, but it seemed pretty brittle.

Prof. KERRY.—How close could you get to it ?

Mr. DAVIS.—You could get right at it.

Prof. KERRY.—Did you feel it with your hand at all ?

Mr. DAVIS.—No, I just looked at it. I heard them speak of it. A man named Callahan and I were driving rivets near the Quebec post and we went down and had a look at the chord on the pier.

Prof. KERRY.—It was there all right ?

Mr. DAVIS.—Yes.

Prof. KERRY.—About 18 inches long ?

Mr. DAVIS.—Yes, I dare say it would be.

7-8 EDWARD VII., A. 1908

Prof. KERRY.—And quite close to the connection with the shoe.

Mr. DAVIS.—Yes, sir.

Prof. GALBRAITH.—Are you sure it was not a fold in the metal done in the blacksmith shop?

Mr. DAVIS.—Sure. I know the difference between a crack and a crimp.

Prof. KERRY.—How wide would it be?

Mr. DAVIS.—There was no width at all. It was only just cracked.

Prof. GALBRAITH.—Crooked or straight?

Mr. DAVIS.—Straight.

Prof. KERRY.—Was there an angle outside?

Mr. DAVIS.—Yes. The plate was bolted and fastened to the bottom-chord.

Prof. KERRY.—Was there an angle outside the plate, or was it just flat?

Mr. DAVIS.—No, I do not think there was an angle at that point.

Prof. KERRY.—Did you see anything else you think of?

Mr. DAVIS.—I do not think I saw anything else at all.

Prof. GALBRAITH.—When did you see that crack?

Mr. DAVIS.—That would be early in June, I should say.

Prof. GALBRAITH.—Did Mr. Yenser, as far as you heard, know anything about it? Do you know if anyone told Mr. Yenser about it?

Mr. DAVIS.—I could not say, but Callahan, my partner who worked with me, said that he would tell Meredith, the riveting foreman, about it.

Prof. GALBRAITH.—Did you feel the bridge more springy than usual at the time of the accident or before the accident?

Mr. DAVIS.—No, I could not say I did. I never felt anything at all.

Prof. KERRY.—It just came when you were not looking for it?

Mr. DAVIS.—It just came unexpected. I never expected anything of the kind, or else I should not have been there for one.

Prof. GALBRAITH.—Did any man speak to you about the bridge being dangerous about that time?

Mr. DAVIS.—Yes, Brind, another man, and also his brother-in-law, Smith, were speaking of it going up to work—that they had seen Yenser and Birks examining a chord.

Prof. GALBRAITH.—Where do you say that chord was?

Mr. DAVIS.—On the Quebec side; what I saw the jacks in. I do not know any other part of the chord.

Prof. GALBRAITH.—About what panel?

Mr. DAVIS.—It would be the 7th or 8th chord.

Prof. GALBRAITH.—You understood, in your evidence before, that it was five or six panels?

Mr. DAVIS.—That is where we were driving rivets. We were driving rivets next to this point where we had the jacks in position. I could not say for certain what panel it would be in. We were up a pretty good way. At that point they were driving rivets the day before the bridge collapsed.

Prof. GALBRAITH.—Do you think that good care was exercised in handling and erecting?

Mr. DAVIS.—Yes, sir, I do really. What I have seen of everything there I always thought it was first-class—what they had in regard to tackle, tools and all that.

Prof. GALBRAITH.—You saw no, what you would call unnecessary risks taken during the erection?

Mr. DAVIS.—No, I did not.

Witness discharged.

Commission adjourned.

SESSIONAL PAPER No. 154

NINTH DAY.

QUEBEC, Wednesday, September 18, 1907.

The Commissioners visited the storage yard of the Phoenix Bridge Company at Belair and the works on the north side of the river, devoting the entire day to a personal examination of the work and material.

TENTH DAY.

QUEBEC, Thursday, September 19, 1907.

The Commissioners spent the day at the wreck on the south shore, and made an examination of the different points referred to in the evidence.

ELEVENTH DAY.

QUEBEC, FRIDAY, September 20, 1907.

The Commission resumed at ten a.m. in the Court House.

RAOUL LAFRANCE, recalled.

(Evidence given in French, and translated by Mr. Stuart.)

Mr. HOLGATE.—You were instructed to go on the ground with Mr. Kinloch and Mr. McLure, and endeavour to find the plate referred to in your evidence?

Mr. LAFRANCE.—Yes, I went.

Mr. HOLGATE.—Did you find the plate?

Mr. LAFRANCE.—No, there was no means of doing so. There was too much iron on it. It is all in ruins. There is no means of finding it.

Mr. HOLGATE.—You marked on a photograph (Exhibit No. 29) the plate that you referred to in your evidence as being cracked? Did you find that plate?

Mr. LAFRANCE.—No, sir. (The remainder of Mr. Lafrance's evidence was translated by Mr. French.)

Mr. HOLGATE.—Will you say that the plate you marked on the photograph is not to be found in the wreck?

Mr. LAFRANCE.—I cannot find it. There is no way of finding it.

Mr. HOLGATE.—How long were you there looking for this plate?

Mr. LAFRANCE.—I was about three-quarters of an hour looking for it.

Mr. HOLGATE.—Did you see other parts of the bridge that were connected up to this plate?

Mr. LAFRANCE.—No.

Mr. HOLGATE.—Were all the parts that were connected up to this plate also missing?

Mr. LAFRANCE.—There was no way of seeing anything—any parts of it. I only saw one piece and it was so much broken up that I could not recognize it well.

Mr. HOLGATE.—Who was with you when you made this inspection?

Mr. LAFRANCE.—I was alone. Mr. Kinloch was down below and there were others there present whose names I do not know.

Mr. HOLGATE.—I understand, Mr. Lafrance, that these parts that you referred to are still there and can be inspected?

Mr. LAFRANCE.—I have not been able to find them anyway. I do not know the different parts of the bridge well enough to recognize the parts, to distinguish them from the other. I was not there long enough for that.

Mr. HOLGATE.—Why did you not stay long enough?

Mr. DAVIDSON.—I think he means he was not working on the bridge long enough to be familiar with them.

Mr. HOLGATE.—Is that what he means?

Mr. LAFRANCE.—Yes, that is what I say. I was not on the bridge long enough to be able to distinguish the different parts of the bridge.

Mr. HOLGATE.—I wish he would clear that up. The plate he marked is there.

Mr. DAVIDSON.—That is not a photograph of the plate he marked at all.

Mr. HOLGATE.—It is one of a plate on the corresponding side?

Mr. DAVIDSON.—Exactly, but it is not the one. Mr. Haley tells me that in the mass of ruins there, in his opinion, it would be absolutely impossible for any one to find it.

Mr. STUART.—Any one that knows anything about it would be able to.

Mr. DAVIDSON.—I dare say that a bridgeman or an engineer might find it, but that is quite a different thing.

Mr. HOLGATE.—We will dismiss this witness and trust to our own examination.

Mr. STUART.—I guess you will not get more information from him.

Witness discharged.

Mr. KINLOCH, recalled.

Mr. HOLGATE.—Mr. Kinloch, will you please give us the history of what took place on August 29 expressly in reference to the fall of the structure and what you actually observed?

Mr. KINLOCH.—My attention was first called by a noise; as near as I could describe the noise it would be like a car running over a stick of timber—the crunching sound of timber—not very loud; in fact, I would not have paid any attention to it if it had not continued. I was just entering the office of the Phoenix Bridge Company and the noise continuing I looked out from the door and saw the end post trembling. I knew something was wrong and I ducked my head and looked up to see the portal. It was inclined slightly away from me and trembling.

Prof. GALBRAITH.—That is at the anchor pier?

Mr. KINLOCH.—That was at the anchor pier, yes, but at the end post.

Mr. HOLGATE.—Could you notice any change in the position of the posts eastward or westward?

Mr. KINLOCH.—No, sir, they seemed to be perfectly straight as far as that was concerned, only leaning over and slowly sinking.

Mr. HOLGATE.—We understand that you were standing on the platform near the office.

Mr. KINLOCH.—I was just turning in the door.

Mr. HOLGATE.—Just describe where you were, Mr. Kinloch, as shortly as you can; state whether it was east or west of the railway track and how far from it? Can you indicate on this plan (referring to Exhibit No. 25) about where you were at the time of the accident?

Mr. KINLOCH.—I was standing at point X on the southerly abutment shown on plan 25.

Mr. HOLGATE.—You might just repeat, Mr. Kinloch, what you saw.

Mr. KINLOCH.—Standing at that point I first heard the noise and then saw the post trembling, and then I had to stoop down a little bit to look for the portal strut.

SESSIONAL PAPER No. 154

Prof. KERRY.—Which post trembled ?

Mr. KINLOCH.—The end post.

Prof. GALBRAITH.—Which side ?

Mr. KINLOCH.—The Quebec side.

Prof. GALBRAITH.—On the right hand side ?

Mr. KINLOCH.—Yes. I could not see the other post. I stepped outside of the door and the same motion was continued. It was slowly sinking and the last clear recollection I have of anything was seeing the two centre post peaks slowly settling straight down in about the same position that they always stood in regard to the line of track. They did not seem to be east or west towards Montreal or Quebec ; they seemed to be about the same as the rest of the bridge. I did not notice any bulging out one way or another. About that time I turned my back to it and did not look at it any more. I should judge then that the portal strut would be about 10 feet above the deck just at a rough guess.

Prof. GALBRAITH.—When you turned your back ?

Mr. KINLOCH.—Yes.

Prof. GALBRAITH.—The portal had gone over ?

Mr. KINLOCH.—It inclined towards the river.

Prof. GALBRAITH.—Northerly ?

Mr. KINLOCH.—Northerly.

Prof. GALBRAITH.—How were the main posts ?

Mr. KINLOCH.—When I last saw them, or the last recollection I had of them, the main posts were standing in their same relative positions ; they looked to be the same distance apart and there was no difference in the height and they seemed to be tied together with the struts and bracing and they seemed to be slowly settling down.

Prof. GALBRAITH.—You could not see them toppling towards the river ?

Mr. KINLOCH.—No, sir.

Prof. GALBRAITH.—They were foreshortened and seemed to be sinking ?

Mr. KINLOCH.—Just the same as if they had been ice and were melting off at the bottom.

Mr. HOLGATE.—When you did look up again, as I suppose you did immediately afterwards, what did you observe particularly ?

Mr. KINLOCH.—It was all down. I did not pay much attention to the wrecked span right off. I looked at the other span to see in what shape it was.

Mr. HOLGATE.—The approach span ?

Mr. KINLOCH.—Yes, sir.

Prof. GALBRAITH.—Were any rails or other materials dragged off the approach span ?

Mr. KINLOCH.—They were pulled some. They pulled the spikes along with them. What I examined, when I said I made an examination of the approach span, was the lower legs to see if anything had happened to them, because I knew there would be a lot of people there, and I did not want it to go down on top of them.

Prof. GALBRAITH.—Of course, that examination took a little time ?

Mr. KINLOCH.—No, not very long, because I immediately made up my mind that there was nothing wrong with it. I looked at it and saw that nothing had hit it, and I did not take any time with it. I do not know how long it did take, but it did not take very long.

Prof. GALBRAITH.—Did you observe any crumpling up of the sway bracing ?

Mr. KINLOCH.—No, sir.

Prof. GALBRAITH.—Could you tell whether the tension chords—the top chords—straightened out or slackened during the fall ?

Mr. KINLOCH.—No, sir.

Prof. GALBRAITH.—You saw no particular indications as to the place where the initial fracture occurred ?

Mr. KINLOCH.—No, sir, not while it was falling.

Mr. HOLGATE.—Did you notice any apparent rise in any portion of the structure during the fall?

Mr. KINLOCH.—No, sir.

Mr. HOLGATE.—I understand that you were engaged as inspector on the work and that you were there before the erection began?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—And continuously during its erection?

Mr. KINLOCH.—All except for about four weeks—the two times I was home to see my father, when he was sick and when he died; practically continuously—yes.

Mr. HOLGATE.—Commencing with the erection of the work, did you observe at any time defects in metals or material which required to be rectified?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—You might give us a description of those that you observed and had to deal with yourself.

Prof. GALBRAITH.—In order if you can.

Mr. KINLOCH.—About the first thing, I guess, that came up was on the setting of the pedestals. We found the masonry had not been dressed quite true, or at least there were little humps sticking up in it. It was rectified by taking the pedestals up and dressing the stone down true. Upon setting the Quebec shoe there was a warp discovered in the shoe—on the east half of the shoe where it did not fit down to the pedestal. Mr. McLure has a record of the actual measurement of it, and I think he could give it better than I could. But my recollection of it is that the maximum part of it was about $\frac{1}{4}$ of an inch.

Mr. HOLGATE.—Mr. McLure can give us those details?

Mr. KINLOCH.—Yes, he has the record of them.

Prof. KERRY.—Where do you make the dividing line between the pedestal and the shoe?

Mr. KINLOCH.—There is a lower pedestal and an upper pedestal. The pedestal is in four sections, the upper and lower pedestal, and then comes the shoe.

Mr. HOLGATE.—Yes?

Mr. KINLOCH.—I do not know whether I can get these quite in order or not.

Prof. GALBRAITH.—As near as possible.

Mr. KINLOCH.—About the next thing that was noticed were these bends in the different chord members, particularly in No. 1, No. 2 and No. 3 of the anchor arm.

Mr. HOLGATE.—Which side?

Mr. KINLOCH.—On the Quebec side.

Mr. HOLGATE.—Tell us what these were?

Mr. KINLOCH.—They were irregular bends in the chords; that is, we would look along the chord, and it would not look straight. I never measured them to know exactly what they were, and I do not know exactly whether they were ever measured or not. I took it up with Mr. McLure and Mr. Birks, and we decided that they were of no importance. A number of other chords that I never paid any attention to were about the same way. There were wavy bends, in and out. I should judge, just guessing at it, that probably the biggest one of them would not be over half an inch.

Prof. GALBRAITH.—These bends were observed before the bridge stress came on?

Mr. KINLOCH.—Yes, before anything was set up. Just the chord was laid.

Prof. GALBRAITH.—They were shop bends?

Mr. KINLOCH.—Yes, they were just as the chord had come from the yard.

Mr. HOLGATE.—These chords are made up of four ribs, are they not?

Mr. KINLOCH.—Yes.

Mr. HOLGATE.—Were all four ribs in just the same shape?

Mr. KINLOCH.—No, the centre rib might be bent in at one place and the outside rib might be bent out a little bit or it might not be in the same place. They were not regular bends; that is, they were not altogether in one way. They were just irregular and occurred at different places.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—Then it was not a regular bending of the whole member?

Mr. KINLOCH.—No, sir.

Prof. KERRY.—Was any action taken to rectify this?

Mr. KINLOCH.—Not that I know of.

Mr. HOLGATE.—Were these particular ones now that you speak of, Nos. 1, 2 and 3 on the Quebec side on the anchor arm, known to others besides yourself?

Mr. KINLOCH.—Mr. McLure and Mr. Birks knew of them.

Mr. HOLGATE.—Anybody else?

Mr. KINLOCH.—Mr. Hoare.

Mr. HOLGATE.—Anybody else?

Mr. KINLOCH.—I do not know myself of anybody else.

Mr. HOLGATE.—Did Mr. Yenser.

Mr. KINLOCH.—Yes, Mr. Yenser knew.

Prof. GALBRAITH.—These were looked upon as minor defects which would not in any way affect the strength or stability of the bridge?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Go on, Mr. Kinloch.

Mr. KINLOCH.—There was a question that came up about certain points being accessible to paint that were put up. That was taken up just about that time. That was taken up with Mr. Hoare and Mr. Deans, and Mr. Deans was to provide some way to put more holes in there so as to get in there to paint. Also, in the matter of rivets in connection with the erection I looked over their list and I found they had what I considered a rivet which was too short for the standard Boyer snap, and it was agreed between Mr. Deans and myself that they would furnish rivets for the standard Boyer snap, and they were furnished.

Prof. GALBRAITH.—The rivets were too short?

Mr. KINLOCH.—They were too short for the standard Boyer snap. They were all old style rivets for the old style snap.

Mr. HOLGATE.—First of all in regard to making parts accessible for paint, what holes do you refer to?

Mr. KINLOCH.—There is a large lateral plate on the bottom chord, there are two bottom cover plates and the top has cover plates also and there is a diaphragm, and it is impossible to get inside of the centre webs to do any painting without cutting a hole in there so as to be able to get your hand in there or some portion of the body or a swab, or a small hole to use a spray.

Mr. HOLGATE.—In what parts were these holes placed?

Mr. KINLOCH.—They were never placed. They were placed in the suspended span, but not in the anchor or cantilever arm.

Prof. KERRY.—The point of controversy was that the chord members near joints could not be kept in proper condition by cleaning and repainting owing to their method of construction?

Mr. KINLOCH.—Yes.

Mr. HOLGATE.—How far had the riveting work advanced before you found you had to make this change?

Mr. KINLOCH.—It had not advanced at all. The only riveting that was being done was a little bit on the tower shell and we stole the rivets from farther ahead and used them.

Mr. HOLGATE.—And the riveting was done on the revised plan which you suggested?

Mr. KINLOCH.—Yes, sir. About this time—

Mr. HOLGATE.—What time?

Mr. KINLOCH.—When they were laying the first chord.

Prof. GALBRAITH.—You might give approximately the date.

Mr. KINLOCH.—It was along between July 20 and 30.

Mr. HOLGATE.—What year?

Mr. KINLOCH.—1905.

Mr. HOLGATE.—Yes.

Mr. KINLOCH.—No. 9-L chord in the anchor arm was repaired in the yard.

Mr. HOLGATE.—Can you speak personally about these repairs?

Mr. KINLOCH.—Yes, sir. It was repaired before they started to raise there.

Mr. HOLGATE.—When was it, in your recollection, repaired—the same season?

Mr. KINLOCH.—Yes, it was the same season; it was in the month of July; I am pretty sure of that.

Mr. HOLGATE.—Somewhere about July it was repaired?

Mr. KINLOCH.—Yes, sir, because I came there about the first day of July and it was repaired and the ninth chord was there on August 24.

Mr. HOLGATE.—Which No. 9 chord was that?

Mr. KINLOCH.—9-L in the anchor arm.

Mr. HOLGATE.—Just tell us about these repairs.

Mr. KINLOCH.—The repairs consisted of the splicing of two angles that were broken and the addition of a new coverplate and cutting off some lacings and putting them back on again.

Mr. HOLGATE.—Were the repairs done to your satisfaction?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Did anybody else besides yourself inspect those repairs?

Mr. KINLOCH.—Mr. Hudson. Mr. Hoare, also, was over there.

Mr. HOLGATE.—What was Mr. Hudson's position then?

Mr. KINLOCH.—He was assistant engineer for the Phoenix Bridge Company, but he had charge of all the erection. He got up plans for the big travellers and he was here supervising the installation of the erection plant.

Mr. HOLGATE.—Was he Mr. Birks' predecessor?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Mr. Hoare also inspected these repairs?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—You inspected 9-L previous to the starting of the repairs yourself?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—What was the actual damage done to that member?

Mr. KINLOCH.—All I saw was that the plate was destroyed, but the two angles—

Prof. KERRY.—That is the cover plate?

Mr. KINLOCH.—Yes, the bottom cover plate.

Prof. KERRY.—The bottom cover plate was pulled off?

Mr. KINLOCH.—Or the top cover plate—I forget which one of them. It had fallen and the two side splice plates had sheared the angles off on the bottom—sheared and broken them together and we cut them off back to a good square bearing, back far enough so that they were square, added an angle, reinforced it with metal and put on extra plates.

Prof. KERRY.—So that the actual damage consisted in the wrecking of one cover plate and the shearing off of one leg of the angles on two ribs?

Mr. KINLOCH.—No, it cracked through the other leg.

Prof. KERRY.—There was no detectable injury to the webs of the chord there at all?

Mr. KINLOCH.—None that I could see. There was an old bend in there that had been put in there evidently in the shop by a chain and that was allowed to remain there. It could not be taken out anyway without heating it or cutting the rib apart. It was not any worse than some of the other bends in the chord, but it showed up because it bent in towards the other rib.

Prof. KERRY.—Which rib was this kink in?

Mr. KINLOCH.—With the chord in position in the bridge it would be the west centre rib.

Prof. KERRY.—What was the damage to the lacing, Mr. Kinloch?

SESSIONAL PAPER No. 154

Mr. KINLOCH.—The upstanding leg was bent down on the other leg. After the fall it continued on that side and just crumpled them down on the other leg.

Prof. KERRY.—And these lacings were cut off?

Mr. KINLOCH.—Yes, and new ones put on.

Prof. KERRY.—What was the extent of the bend in the rib—about half an inch?

Mr. KINLOCH.—Yes, I would say half an inch. It was very short and very shallow.

Prof. KERRY.—It did not go down any distance?

Mr. KINLOCH.—No.

Prof. KERRY.—Just at the edge?

Mr. KINLOCH.—Yes.

Prof. GALBRAITH.—The upper edge or the lower?

Mr. KINLOCH.—The upper edge.

Prof. GALBRAITH.—Whereabouts in the chord was this bend?

Mr. KINLOCH.—About 15 feet from the field splice at the 8 and 9 end.

Prof. KERRY.—You were satisfied, after the repairs, that the chord was straight?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—Any wave in excess of how much would be readily detectable by the eye? Could you see half an inch very clearly?

Mr. KINLOCH.—Yes, I think so. I could see a quarter of an inch.

Mr. HOLGATE.—That is 9-L?

Mr. KINLOCH.—9-L.

Mr. HOLGATE.—That is the only chord you have referred to on the left hand side, so far.

Mr. KINLOCH.—There were others bent too, but just slight like 1, 2 and 3.

Mr. HOLGATE.—Which others were they?

Mr. KINLOCH.—I do not know now. I did not pay much attention to them.

Mr. HOLGATE.—That is on the left side?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Did you notice anything out of the ordinary in 10-L?

Mr. KINLOCH.—Anchor arm?

Mr. HOLGATE.—Anchor arm.

Mr. KINLOCH.—No, I am not sure I remember anything now.

Mr. HOLGATE.—Take the right hand side. You have already spoken of 1, 2 and 3; were there any others that your attention was drawn to?

Mr. KINLOCH.—There were others that had slight bends in them, the same as 1, 2 and 3.

Mr. HOLGATE.—Was there any one that your attention was drawn to more than another?

Mr. KINLOCH.—No, I do not think there was, but 1, 2 and 3 were the first in there and after that I did not pay much attention to them unless they were bad. If they were bad I would have noticed them.

Mr. HOLGATE.—The remarks you made in regard to your estimation of these chords, 1, 2 and 3, apply to the other lower chords on the right hand side of the anchor arm.

Mr. KINLOCH.—Some of them were a lot straighter than 1, 2 and 3. In other words, I could not say that there was a chord straight—absolutely straight—on the whole bridge. That is the ribs, you know. There might be a straight rib and there might be a slight bend. Some of these bends were very slight.

Prof. KERRY.—Within what deflection would you say they were straight?

Mr. KINLOCH.—Within half an inch.

Prof. GALBRAITH.—You do not expect in any species of construction to get things absolutely straight?

Mr. KINLOCH.—No, sir.

Mr. HOLGATE.—Now, you have come to the centre post. Have you anything to say in reference to similar matters beyond chord 10 on the anchor arm?

7-8 EDWARD VII., A. 1908

Mr. KINLOCH.—That is the last chord in the anchor arm.

Mr. HOLGATE.—But beyond chord 10 ?

Mr. KINLOCH.—In the cantilever arm ?

Mr. HOLGATE.—Yes, following out on the bridge.

Mr. KINLOCH.—I would say about the same condition existed out there ; matters were about the same.

Mr. HOLGATE.—Was there anything then discovered by you which, in your opinion, was not good shop practice ? What I mean by that is the fabricated material that you received ; did you consider it well put together and in as good condition as you might expect to receive it in from the manufacturer ?

Mr. KINLOCH.—In a general way, yes.

Mr. HOLGATE.—Then are we to assume that in some details it was not ?

Mr. KINLOCH.—There were some little things, I suppose, that had slipped through the shop.

Mr. HOLGATE.—What were they ?

Mr. KINLOCH.—They were mostly trivial things. An angle would have borings behind it or something and had not been bolted up, and it would have to be drilled or reamed.

Mr. HOLGATE.—Were there any blind holes ?

Mr. KINLOCH.—A few—remarkably few, though, considering the job. There are always more or less blind holes on any job.

Mr. HOLGATE.—Are these matters on record ?

Mr. KINLOCH.—I think there are ; yes, sir.

Mr. HOLGATE.—Who would have these records ?

Mr. KINLOCH.—Mr. McLure.

Mr. HOLGATE.—In the shipment and handling of fabricated material such as this, is there any liability to injury by deforming the parts from careless loading as a general rule ?

Mr. KINLOCH.—No, I do not think so as a general rule. There might be some things that would be, but as a general rule it would not be.

Mr. HOLGATE.—Could you attribute anything in this case to careless loading ?

Mr. KINLOCH.—I do not remember any instance where anything was damaged, in my opinion, by careless loading.

Mr. HOLGATE.—Would you say the loading and the transportation had been carefully done ?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Generally speaking, is it not a fact that even with careful shop inspection loose rivets are discovered in members before erection occasionally ?

Mr. KINLOCH.—Yes, sir, and especially on a big work like this where you drive the field splices you are pretty apt to loosen up some of the rivets that are next to them.

Mr. HOLGATE.—What have you to say as to the condition that you know the shop riveting to have been in ?

Mr. KINLOCH.—Generally good.

Mr. HOLGATE.—Did you ever have to make any complaints about the shop riveting ?

Mr. KINLOCH.—No, sir.

Mr. HOLGATE.—Then, your inspection was complete enough to have fully informed you ?

Mr. KINLOCH.—I did not test all the shop rivets ; in fact, I did not test any of them, only those that would come next to the splices I was driving in the field myself. I am speaking from appearances when I say that.

Mr. HOLGATE.—You saw nothing to lead you to suspect loose rivets ?

Mr. KINLOCH.—No, sir ; that is as a general thing. Once in a while I would find a loose rivet and a bad rivet.

Mr. HOLGATE.—In the shop riveting ?

Mr. KINLOCH.—In the shop riveting.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—Was that more or less than you might ordinarily expect in heavy work?

Mr. KINLOCH.—I would say about the same.

Mr. HOLGATE.—Would you look for more in very heavy work than in lighter work?

Mr. KINLOCH.—Certainly.

Mr. HOLGATE.—Have you ever had as heavy work pass through your hands?

Mr. KINLOCH.—No, sir.

Mr. HOLGATE.—Did you find any more in this work than you did in any other work that has passed through your hands?

Mr. KINLOCH.—No, sir.

Prof. KERRY.—What are we to understand from that? Would you say that due care had been taken in the riveting and in the inspection at the shop?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—The chord ribs were built up of parallel plates. Have you noticed anything at any time to indicate whether the surfaces of these parallel plates were dry when they were riveted together or oiled?

Mr. KINLOCH.—Before or since the wreck?

Prof. KERRY.—At any time.

Mr. KINLOCH.—I would say they were painted before they were riveted together.

Prof. KERRY.—Have you evidence that the paint was fully dry before they were riveted together?

Mr. KINLOCH.—No, sir.

Prof. KERRY.—Or have you evidence to the contrary?

Mr. KINLOCH.—Evidence to the contrary!

Prof. KERRY.—From what you say and you know there were parts of the surfaces in contact that had liquid oil paint in between them?

Mr. KINLOCH.—It is customary in all shops to do that.

Prof. KERRY.—You say that that is the general shop practice, Mr. Kinloch?

Mr. KINLOCH.—Yes, what shops I have been in.

Prof. KERRY.—What is the reason for it?

Mr. KINLOCH.—Economy, I guess; to get the work out; that is all.

Prof. KERRY.—Why should the surfaces be painted with oil paint?

Mr. KINLOCH.—To keep them from rusting.

Prof. KERRY.—Have you any experience in your work as an inspector to justify that practice?

Mr. KINLOCH.—Yes, sir, only I think it ought to be dried before it was put together.

Prof. KERRY.—Do you mean to say that you have, in inspecting bridges, come across cases where the joint between two parallel plates riveted together has been badly rusted in between the plates?

Mr. KINLOCH.—Not between plates so much as between angles and plates.

Prof. KERRY.—When you mentioned that word 'economy' did you mean that in order to get the work out quickly it was customary to paint it and rivet it up without waiting for the paint to dry?

Mr. KINLOCH.—That is the general practice in all the shops. They paint their work and they do not give it time to dry, because if they did the different members would be scattered all over and they would have to bring them all together; so they usually paint it as the work goes on.

Prof. KERRY.—In order not to have material delayed in passing through the shop?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—Referring again to your work as an inspector, Mr. Kinloch, would you consider it possible under ordinary shop methods to completely fill a rivet hole?

Mr. KINLOCH.—It would depend on the hole.

Prof. KERRY.—For example a hole fastening together four half-inch plates?

7-8 EDWARD VII., A. 1908

Mr. KINLOCH.—It would depend on whether the hole was straight or crooked and whether it had any offsets in it or had been reamed.

Prof. KERRY.—Your general observation has been that such holes are completely filled or not ?

Mr. KINLOCH.—It depends on the place. If it is a good straight hole and the rivet is short it will fill it, and it will fill a moderately long hole, but if the plates are not matched, if there is even the least little bit of an offset, it will project more at the end it is driven from than the other end ; it gradually grows less from the driven end towards the head.

Prof. KERRY.—Had you any opportunity to observe the riveting done on this work ?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—How did you find such rivets as you had to cut out ?

Mr. KINLOCH.—About the condition I had described.

Prof. KERRY.—What they were filled at the end and slack towards the centre.

Mr. KINLOCH.—If they were in that kind of a plate.

Prof. KERRY.—If they were through a bad plate. To what extent did you find pieces in which the preliminary work in the assembling had been inaccurately done ?

Mr. KINLOCH.—I do not know as I ever found any. In assembling in the shop a thing may be just a little off and if steel like this with five or six plates falls off one-sixth of an inch, it is much worse than a quarter of an inch in $\frac{1}{2}$ or $\frac{3}{4}$ plates, so far as getting a drift pin or anything through to make your hole, is concerned.

Prof. KERRY.—Have you come across instances in cutting out any of the riveting on the bridge here, in which the hole was not true ?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—To any considerable extent ?

Mr. KINLOCH.—No, not very much.

Prof. KERRY.—When you say that there were some inaccuracies in the punching of the plate, was that to an extent in any way unusual in good work ?

Mr. KINLOCH.—I would say it was better than most work.

Prof. KERRY.—Better than the average work ?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—And the punching for the field rivets would be a fair indication, would it not, of the accuracy of the same work on the parts that were shop driven ? That is to say a plate which is being driven for both field rivets and shop rivets is punched at the same time completely.

Mr. KINLOCH.—No, I do not think it was in this case.

Prof. KERRY.—It was not ?

Mr. KINLOCH.—No, I think not in some cases, especially the chord members, they were drilled from the solid after the member was riveted together. So I understand, I do not know that personally.

Prof. KERRY.—In putting in the field rivets did you find in general that the holes agreed thoroughly ?

Mr. KINLOCH.—Not always, no, sir.

Prof. KERRY.—Due to the difficulties in the changing length of the members or due to shop work ?

Mr. KINLOCH.—Well, the holes on this bridge were different from any other bridge, that is it was continually changing, the panel lengths and the holes were pretty nearly all bad on the start.

Prof. KERRY.—That was on account of conditions ?

Mr. KINLOCH.—That is on account of the chamber in the span, the method of erection.

Prof. KERRY.—You would not know any way in which that could have been avoided ?

Mr. KINLOCH.—No, not at the start. Of course there was the usual number of

SESSIONAL PAPER No. 154

holes that were bad when the span came together, and they were supposed to be right as they would on any other span.

Prof. KERRY.—The work was up to good average practice!

Mr. KINLOCH.—Yes, some places we would have evidence that the holes were bad, may be two, four or five joints you would not have a bad hole, you could drive every hole in the joint.

Prof. KERRY.—The practice was to ream out all bad holes, previous to riveting!

Mr. KINLOCH.—If they were bad enough to require reaming.

Prof. KERRY.—But where the inaccuracy was small you simply straightened it out with drift pins!

Mr. KINLOCH.—Drift pins, yes, sir.

Prof. KERRY.—Do you consider that the amount of field riveting required on this work was the least that could have been made necessarily?

Mr. KINLOCH.—I am not an engineer, I do not pretend to answer that question.

Prof. KERRY.—Are you of the opinion that any of the joints that you had to rivet up in the field could have been riveted up in the shop?

Mr. KINLOCH.—I never paid much attention, I do not think they could rivet much more in the shop than they did.

Prof. KERRY.—That is to say they reduced the number of field rivets to the minimum?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—And the inspection of the field rivets was very close, that was your personal duty, was it not?

Mr. KINLOCH.—Yes, that was my personal duty. Well, I have my own standard, I do not know what you—

Prof. KERRY.—And your opinion is that the field rivets that were driven, would compare very favourably in efficiency with a shop rivet?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—That they would give just as good service?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Now, we have covered that ground pretty thoroughly, so far; will you go on now, and tell us of any other points to which your attention was attracted?

Mr. KINLOCH.—There was an angle on a centre post section.

Mr. HOLGATE.—Which section of the centre post?

Mr. KINLOCH.—C.P. 6 R. A chain had got foul of it or something in the yard, and they cracked it, and Mr. Clark called us up and we went over and looked at it, and drawings were made and sent to Mr. Cooper at Phoenixville.

Mr. HOLGATE.—By whom?

Mr. KINLOCH.—I am not sure whether Mr. McLure or Mr. Birks made the drawing.

Mr. HOLGATE.—Sent to Mr. Cooper?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—By whom?

Mr. KINLOCH.—Well, it was approved by Mr. Cooper. I won't say; that is all I know; all these things were submitted to him. That is not my own personal knowledge, anyway.

Prof. GALBRAITH.—You mean the repair was submitted to him for approval?

Mr. KINLOCH.—Yes, that was repaired, anyway.

Mr. HOLGATE.—In accordance with the plan approved by Mr. Cooper?

Mr. KINLOCH.—Well, I have no personal knowledge that Mr. Cooper did approve that, but he approved most of these things, and I suppose he did this. I corrected myself on that.

Mr. HOLGATE.—Did you see a plan showing the repairs required?

Mr. KINLOCH.—I certainly must have, but I do not recollect now much about it.

Mr. HOLGATE.—Just describe what was repaired!

Mr. KINLOCH.—Well, it was simply a little piece broken out of the edge of an angle, a big heavy angle, one of the webs of the main centre post.

Mr. HOLGATE.—How high above the pier would that be?

Mr. KINLOCH.—About 50 feet, between 30 and 50 feet from the top of the pier. It was repaired by putting a plate of the same size or a little larger plate riveting it up on the angle, about 7 or 8 feet on each side of it. That was done a long time ago. I do not recollect much about it. I know it passed out of my mind.

Mr. HOLGATE.—You inspected that repair?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Was it properly done?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—You mentioned a repair that was made on chord A-9 L. Have you inspected that chord in connection with the part that was repaired, since the accident?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—And how did you find it?

Mr. KINLOCH.—All right.

Mr. HOLGATE.—Injured in any degree?

Mr. KINLOCH.—No, sir, practically the same as the day it was put on there.

Prof. GALBRAITH.—That is, the repairs are the same.

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Then with regard to the repairs made on the centre post, have you been able to examine that part since?

Mr. KINLOCH.—I think that is in the crushed part of the post.

Mr. HOLGATE.—So far you have not been able to locate that?

Mr. KINLOCH.—No, I have not.

Mr. HOLGATE.—Are there any other matters, Mr. Kinloch?

Mr. KINLOCH.—The top of the C.P., one section of the centre post, which has a bracket riveted on to it, when we riveted the other bracket on to it, we found it was dished slightly. That was reported to Mr. Cooper, and his recommendations were followed on it.

Prof. KERRY.—That is that one bracket was shop riveted to the post section.

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—And the second bracket was field riveted?

Mr. KINLOCH.—Field riveted.

Prof. KERRY.—And it was found that the surface was dished and not perfectly plane.

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—Mr. Cooper's recommendation was followed?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—What was it?

Mr. KINLOCH.—To secure a certain amount of bearing, I forget just what it was but Mr. McLure has it in his notes.

Prof. KERRY.—Which section, C. P. 1?

Mr. KINLOCH.—Both C. P. 1 R and C. P. 1 L.

Mr. HOLGATE.—Anything else?

Mr. KINLOCH.—There was a slight error in detail in one of the top longitudinal struts. That was cut off. That was reported, I believe, to Mr. Cooper also. It was simply cut off, there was a plate put in there that interfered with the top of the post section in working. I believe that is about the only error in detail that we found in the whole bridge.

Mr. HOLGATE.—Do you mean to say that in the erection of that bridge, you found only that one error in detail?

Mr. KINLOCH.—That was the worst one that we found. There might have been some little things where maybe we would have to chip off a little of a plate or something like that, but simply more an error of the shop in workmanship of $\frac{1}{4}$ of an inch

SESSIONAL PAPER No. 154

or something. I do not remember any example of that but this plate, the top longitudinal level was the only correction we had to make, I do not remember any other at present!

Prof. GALBRAITH.—How many sections are there in the centre post?

Mr. KINLOCH.—There is the peak that goes on top of the centre post, there are the caps which are the top section and C. P. 1, C. P. 2, C. P. 3 and 4 in one section, C. P. 5, C. P. 6 and the centre post foot.

Prof. GALBRAITH.—Then the only shop riveting that was done in these six sections was the junction at the splice between C. P. 3 and C. P. 4; is that what you mean?

Mr. KINLOCH.—Yes, sir.

Prof. GALBRAITH.—All the others were field riveted?

Mr. KINLOCH.—Field riveted, yes.

Mr. HOLGATE.—Then you found the work as delivered for erection, entirely accurate with the exception of that one instance that you mentioned?

Mr. KINLOCH.—In regard to detail, yes. These other holes, and one thing and another, those little inaccuracies, a blind hole, once in a while—

Mr. HOLGATE.—And are those such as apply to any work?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Whether great or small?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—You refer now not only to riveted members but to all members in that whole structure?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Including eye-bars?

Mr. KINLOCH.—Eye-bars.

Mr. HOLGATE.—Pins and all other parts?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Were there any matters in connection with the pins or eye-bars that were discovered indicating inaccuracy or anything out of place at any time?

Mr. KINLOCH.—Would you repeat that?

Mr. HOLGATE.—During erection and after the eye-bar system had been placed, was your attention called to anything particular at any pin joint in the tension system which you examined?

Mr. KINLOCH.—Yes, sir. A set of diagonal bars showed a mark that I did not understand. I spoke to Mr. Yenser about it, and he sent a couple of men back and we broke all the key wrenches we had on the job trying to get a nut off, but could not and we examined it as well as we could without getting the nut off.

Prof. GALBRAITH.—What one of the diagonals was that?

Mr. KINLOCH.—T. 40.

Prof. GALBRAITH.—Upper or lower?

Mr. KINLOCH.—On the lower side.

Mr. HOLGATE.—What was that unusual happened there?

Mr. KINLOCH.—I assumed that a saucer had slipped a little bit?

Mr. HOLGATE.—This was on the left side?

Mr. KINLOCH.—Yes, sir. A saucer had slipped a little bit and made a mark there, and I did not know what had caused it and wanted to find out. We worked on it, as I said there. Mr. McLure and Mr. Milliken and Mr. Yenser and Mr. Birks were there, and we examined it and made up our minds that there was nothing in it because Mr. McLure had said that the bars had their maximum stress some time before, that the stress was getting less now than before and we waited until we could get a big key wrench and see what it was; we decided that it was one of two things, that two little rings in there had been left out or that there must have been some motion in there. Yesterday we succeeded in getting the nut out and saw there was no motion and as far as we can see the two little rings are missing, had not been packed in. They are more for looks than anything else.

Mr. KINLOCH.—Did you find the condition, on examination yesterday, to be what it should be?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—And nothing at all out of place?

Mr. KINLOCH.—No, sir.

Mr. HOLGATE.—Or wrong?

Mr. KINLOCH.—No, sir.

Mr. HOLGATE.—With the exception of the little packing rings?

Mr. KINLOCH.—The packing rings were missing as far as we could see.

Mr. HOLGATE.—At any rate, the joint itself was intact and you had to remove the nut?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—I would like to cover all these points, Mr. Kinloch, if you can recollect them.

Prof. KERRY.—On that tension system in your inspections, Mr. Kinloch, did you notice anything that would indicate that the eye-bars were not acting equally, the eye-bars in any set, or had you reason to believe they were all equally strained, as far as you could judge?

Mr. KINLOCH.—As far as I could judge they all seemed to be about the same. There was one panel, the top chord eye-bars in the cantilever arm, that were not much strained yet, moving them with the feet some of them seemed to be tighter than the others; they were not strained up.

Prof. KERRY.—But all the panels that were fully strained seemed to be tightened up?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—Now we would like you to go back and finish your own story of what you saw on the bridge without bothering with our questions yet, just your own recollections?

Mr. KINLOCH.—Mr. McLure called my attention to some plates at the foot of the centre post. That photograph shows that very well—(Exhibit 29)—where this diagonal connects to this post. The hitch angles between 50 and the centre post. (Witness indicated on the photograph the points referred to.) He called my attention to the paint crinkling on the outside of the plate like there might be a motion there of the P-50 and the centre post closing together. We examined all the rest of the same plates, there are eight of them altogether, and we found the same conditions to exist in all the eight plates.

Prof. GALBRAITH.—Were they bulging out?

Mr. KINLOCH.—They were not bulging out any more than the cracks in the paint were radiating just like the sun.

Prof. GALBRAITH.—Did the crack show in the paint or were there little bulges?

Mr. KINLOCH.—Just little bulges; the paint was raised up.

Prof. GALBRAITH.—The paint itself was bulged along this line?

Mr. KINLOCH.—Yes.

Prof. GALBRAITH.—Showing compression, showing coming together.

Mr. KINLOCH.—That is what it would indicate.

Mr. HOLGATE.—Was it a blistering of the paint?

Mr. KINLOCH.—I do not think so.

Mr. HOLGATE.—What did you do then, Mr. Kinloch?

Mr. KINLOCH.—I think that Mr. McLure took that up with Mr. Cooper, and he will have a record of that; he can explain it better than I can.

Mr. HOLGATE.—When you say there are eight of those plates, are you counting in the two centre posts?

Mr. KINLOCH.—Yes, in the two centre posts.

Mr. HOLGATE.—Four on each centre post?

Mr. KINLOCH.—Four in each centre post, yes. I do not know that I can think of anything more now until coming right down close to the time of the accident.

SESSIONAL PAPER No. 154

Prof. GALBRAITH.—At what period during the erection did you notice this, how far had the work been carried on the cantilever side?

Mr. KINLOCH.—The cantilever arm was erected.

Prof. GALBRAITH.—It was completed?

Mr. KINLOCH.—Yes, sir.

Prof. GALBRAITH.—Was any of the suspension bridge done?

Mr. KINLOCH.—I do not think there was. I do not think they had started to raise the suspension span.

Mr. HOLGATE.—Have you now enumerated all these matters which you might call extraordinary?

Mr. KINLOCH.—All that I can remember just now. There was that crack in that plate in P-4, that P-4 that Mr. Chase spoke of, that was repaired.

Mr. HOLGATE.—You refer now to the one that was mentioned by Lafrance?

Mr. KINLOCH.—No, by Chase.

Prof. KERRY.—You might give those particulars?

Mr. KINLOCH.—Shortly after the plate was put on—

Prof. KERRY.—Which plate?

Mr. KINLOCH.—This is a bent plate, I do not remember the number. It connects the lateral plate and the truss floor beam gussets to the post.

Prof. KERRY.—Which post?

Mr. KINLOCH.—P-4.

Prof. KERRY.—L or R?

Mr. KINLOCH.—R. There was a crack about 2 inches, I will say 2 inches limit in length opened up in the back edge of it, right close to the post. Whether it had been there before in the plate and that it had been fully opened when the bolts were put in I do not know, that is the first time I noticed it. It was repaired by putting another plate on top of it.

Prof. KERRY.—Were plans for that prepared and submitted to Mr. Cooper?

Mr. KINLOCH.—No, sir.

Prof. KERRY.—It was just done right there?

Mr. KINLOCH.—Yes, it was considered of no importance, we did it right there.

Prof. KERRY.—Did you ever notice anything on the plates that have been mentioned by the witnesses Lafrance and Davis?

Mr. KINLOCH.—No, sir.

Prof. KERRY.—You have also heard of the evidence of the witness Ouimet at the coroner's inquest?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—Did you ever notice anything on that plate?

Mr. KINLOCH.—No, sir.

Prof. KERRY.—And you had examined each of one those plates at frequent intervals?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—And no report of any crack in those plates had reached you?

Mr. KINLOCH.—No, sir.

Prof. KERRY.—The witnesses have stated that they saw the crack somewhere about the first of June. Roughly speaking, how many times would you have seen the plate since then?

Mr. KINLOCH.—Probably 150.

Mr. DAVIDSON.—I recollect that there was a point in Mr. Kinloch's evidence, when he was told that he would have a full opportunity of explaining some statements later. I would like to find out now what they were and what he has to say about them.

Mr. HOLGATE.—This is what Mr. Kinloch said:

'There is a line to draw. There were some things I wanted done that I did not

7-8 EDWARD VII., A. 1906

get done, but they were taken up and they never have been settled yet. It was out of the line of workmanship though.'

Do you recollect that statement of yours ?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—You may explain just what you meant there.

Mr. KINLOCH.—That was in regard to those paint holes in the chords.

Mr. HOLGATE.—That you have already referred to in this morning's evidence ?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—Anything else ?

Mr. KINLOCH.—No, I cannot think of anything else.

Mr. HOLGATE.—When that matter was brought up in your previous evidence we said that we would bring it up again and give you a full chance to explain what you meant. Have you any further explanations to make ?

Mr. KINLOCH.—Would you read that question again ?

Mr. HOLGATE.—The question that brought this up was this :

'Prof. KERRY.—During the work everything that you considered necessary as to the quality of the work 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.'

Mr. KINLOCH.—I think that covers everything only little minor things like wanting to get some painting done or something like that ; nothing of any importance at all outside of the paint holes in the chord.

Mr. HOLGATE.—But nothing that affected the structure itself ?

Mr. KINLOCH.—No, sir.

Mr. HOLGATE.—Is that it, Mr. Davidson ?

Mr. DAVIDSON.—Well, of course Mr. Kinloch says these were the matters referred to. I did not know what they were, I just had what you have just read.

Mr. HOLGATE.—Mr. Kinloch says those are the only matters he has in mind. Is there any other point ?

Mr. DAVIDSON.—Not in this particular part of the examination, no.

The Commission took recess.

AFTERNOON SESSION—ELEVENTH DAY.

Mr. HOLGATE.—Mr. Kinloch, did you make any minute examination of any particular parts of the structure immediately prior to the accident ?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—You might tell us just what they were, beginning with the first calling of your immediate attention to it, and giving the dates consecutively through the whole examination.

Mr. KINLOCH.—Well, in regard to the date of my first noticing a buckling in the field splice of the east centre rib, in chord 7 and 8, I am not sure within about a week.

Mr. HOLGATE.—Chord 7 and 8, where ?

Mr. KINLOCH.—Cantilever arm.

Mr. HOLGATE.—Right or left ?

Mr. KINLOCH.—Left.

Prof. KERRY.—Montreal side ?

Mr. KINLOCH.—Montreal side, yes. But on going down to inspect that point after the rivets were driven, I first noticed this bent, it was bent in towards the other centre rib, as near as I can remember now, about half an inch and about 6 feet. Mr.

SESSIONAL PAPER No. 154

Birks and Mr. McLure had their attention called to it and they measured it, and I think Mr. McLure has a record of it.

Prof. KERRY.—Roughly about what time?

Mr. KINLOCH.—Oh, about four or five weeks before the accident. We talked together on some method of overcoming it, and it was finally decided to put a diaphragm up in there and by cutting out five rivets on each side of the joint, bring it back to its proper position. It was sent in to Mr. Cooper for his approval and he did not give it his approval. He evidently misunderstood the case, and there was nothing more done with it, it remained in that position up to the time of the accident.

Prof. KERRY.—That is the field splice between 7 and 8 on the cantilever arm, Montreal side?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—The buckle was in the east centre rib?

Mr. KINLOCH.—The centre rib.

Prof. KERRY.—Towards the west centre rib?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—And the two ends bent like that (indicating)?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—There would be no opening, Mr. Kinloch, between the cover plate and the rib, the plate itself would be bent?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—That is the whole story in regard to that point?

Mr. KINLOCH.—Yes. Now, as near as I can judge, about the 20th of August—I am not sure about that date either, it might be a day or two either way—the chord 8 and 9, cantilever arm, when a boy painted the rivets, I was coming down the chord and the new paint on the rivets drew my attention to it, and I fancied I could see a curve right at the splice. I investigated the same, and found that there was. I looked along the rest of the chord and found some distortion in that, in the ribs, that is chord 8.

Prof. GALBRAITH.—On which side of the panel point is the field splice?

Mr. KINLOCH.—It is to the river side of the post.

Mr. HOLGATE.—Did you observe closely what that bend amounted to?

Mr. KINLOCH.—Yes, sir, I looked at it very closely, I examined it with care, and chord 9 also, and found that somewhat distorted and also chord 10, in the cantilever arm, three chords, one on top of the other; but they were very slight, and I was very much in doubt in my mind whether they might have been something originally there, although they looked bigger to me than any I had seen before. But this one bend in the splice puzzled me a good deal.

Mr. HOLGATE.—That is in the splice between 8 and 9?

Mr. KINLOCH.—Yes, between 8 and 9.

Prof. GALBRAITH.—What plates showed that?

Mr. KINLOCH.—The side splice plates.

Prof. GALBRAITH.—On both sides?

Mr. KINLOCH.—Yes, sir. From the general appearance, to describe it, it would look just as if No. 9 chord was a little bit wider than No. 8. The bend did not seem to be in No. 9, but No. 9 appeared to run out straight and No. 8 to run out to meet it. This bend was very slight, but it was there.

Prof. KERRY.—That is to say both sides went out from the centre—

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—of chord No. 8?

Mr. KINLOCH.—Of chord No. 8.

Mr. HOLGATE.—In what condition was that joint at that time?

Mr. KINLOCH.—Fully riveted. That is one thing that worried me as much as anything else, because I was positive when it was riveted up that it was straight.

Mr. HOLGATE.—Did you make any measurement to verify what appeared to the eye?

Mr. KINLOCH.—No, I made no measurement of that.

Mr. HOLGATE.—When you discovered that, what did you do?

Mr. KINLOCH.—I called Mr. Birks' attention to it, and we talked the thing over there and he did not consider it much, in fact I did not consider it myself.

Mr. HOLGATE.—You talked it over where?

Mr. KINLOCH.—On the chord. Mr. McLure was in the hospital at that time. When Mr. McLure got out I called his attention to it. That was a couple of days afterwards.

Mr. HOLGATE.—What sort of an examination did Mr. Birks make at the time?

Mr. KINLOCH.—Just about like I did. We just got down and sighted along the ribs.

Prof. GALBRAITH.—Did the angles—?

Mr. KINLOCH.—The angles seemed to be straighter than the rest of it. It was more bowed at the centre than at the two ends.

Prof. GALBRAITH.—You had to stoop down and look over the side?

Mr. KINLOCH.—We could stand on the ladder on the top and see it more plainly than anywhere else. We could see it more plainly on account of the new paint on it.

Prof. KERRY.—Do you know if that was reported to Mr. Cooper?

Mr. KINLOCH.—No, sir.

Prof. KERRY.—Do you know if it was reported to Mr. Hoare?

Mr. KINLOCH.—No, I do not.

Prof. KERRY.—Do you know if it was reported to Mr. Yenser?

Mr. KINLOCH.—Yes, it was reported to Mr. Yenser.

Prof. KERRY.—Did he express any opinion at all?

Mr. KINLOCH.—No. At that time we all considered it unimportant although it was pretty hard to figure out what you would consider it now and then. I am trying to separate this thing and get out what I thought at that time.

Prof. KERRY.—It was a very unusual thing, almost otherwise unknown, for the outer cover plate to show any alteration from the flat?

Mr. KINLOCH.—Yes, sir. I do not know of any other place in the bridge which ever did that, except in chord 9-L in the anchor arm afterwards.

Prof. KERRY.—There might have been such distortions on the inner ribs without their being observable?

Mr. KINLOCH.—Yes.

Prof. KERRY.—They would be covered up?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Is that the only thing noticeable in that chord?

Mr. KINLOCH.—The ribs were bent and the chord.

Mr. HOLGATE.—Just at that place?

Mr. KINLOCH.—No, they were irregular bends. They were not long bends like other chords. They were more like any bends would be in any chord. They were not uniform; they were not all bent in any one way.

Prof. GALBRAITH.—In designating the chords the numbers refer to the distance from field splice to field splice and not to the distance from panel point to panel point?

Mr. KINLOCH.—No, sir, from field splice to field splice.

Prof. GALBRAITH.—So that the same chord is in different panels?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—The bends that you refer to, Mr. Kinloch, did you consider at that time that they were shop bends?

Mr. KINLOCH.—I was in doubt about it. They were not pronounced enough more than the others to enable me to determine whether they could have been made in the field or whether they were shop bends.

Mr. HOLGATE.—But you did not observe them before August 20?

Mr. KINLOCH.—No, sir; about that date. It was within a day or two of the 20th.

SESSIONAL PAPER No. 154

Prof. GALBRAITH.—How long had that chord been in position ?

Mr. KINLOCH.—Since away early in 1808. Mr. McLure could give you the exact date.

Mr. HOLGATE.—When you met Mr. Birks there did he lead you to suppose that he had noticed that before ?

Mr. KINLOCH.—No, sir.

Mr. HOLGATE.—Can you say that it had been noticed by any one before that time ?

Mr. KINLOCH.—No, not at that time; not the first time.

Mr. HOLGATE.—Not before the 20th of August ?

Mr. KINLOCH.—No.

Prof. KERRY.—I understand, Mr. Kinloch, that it has not been unusual to find that the centre ribs of 2 adjoining chord sections did not line correctly when the lower cover plate was taken off ?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—Was that ever noticed on the outside ribs ?

Mr. KINLOCH.—Not to my knowledge.

Prof. KERRY.—Only on the centre ribs ?

Mr. KINLOCH.—Only on the centre ribs ?

Prof. KERRY.—And it was the practice in that case to jack the centre ribs over from the outside ribs until they came into perfect line when they were rivetted ?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—So that that failure to line correctly on the part of the centre ribs might be attributed either to the working of the bridge or to the failure to draw these two ribs into exact line at the time that chord was originally put in ? You had no means, in other words, of knowing that the two inside ribs lined exactly at the time it was put in place ?

Mr. KINLOCH.—Not at the bottom, no, sir.

Prof. GALBRAITH.—What was the practice with respect to the placing of the diaphragm plates ? Was it the practice to place the diaphragm plates close to the ends of the ribs in all cases ?

Mr. KINLOCH.—Some were right at the ends, but most of them were back about three or four feet.

Prof. GALBRAITH.—From the cover plate ?

Mr. KINLOCH.—No, they were not on the other side of the cover plate but back from the joint about three or four feet as near as I can remember.

Prof. GALBRAITH.—Do you remember many cases where they were within six inches or a foot from the end of the ribs ?

Mr. KINLOCH.—No; on chord 10 they were at the end of the joint and at the end of No. 9, I think; I am not positive now without looking at the drawings.

Prof. GALBRAITH.—On chord 10 they were close to the joint ?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—Going back to the side plates, Mr. Kinloch, it was the practice, was it not, in making provision for the camber to have the lower chord joints alternately open at the top and bottom ?

Mr. KINLOCH.—Yes.

Prof. KERRY.—Was there any noticeable difference in the lining of the ribs of the chords at the joints that were differently treated in that respect ?

Mr. KINLOCH.—Yes, sir, in pretty nearly all the cases—the ones that I know of—they were all right at the top. It was only at the bottom that the ribs were off line.

Prof. KERRY.—Supposing you took one case in which two chord sections were brought together at the top with a camber opening down at the bottom and then took another case in which two chord sections were brought together at the bottom and the camber opening at the top, would there be any noticeable difference in the accuracy with which these two would line when you got ready to rivet up ?

Mr. KINLOCH.—I think I answered that question. The ones that were open at the bottom would not line. The only ones that do not line are there.

7-8 EDWARD VII., A. 1908

Prof. KERRY.—When they were open at the top they lined all right ?

Mr. KINLOCH.—Yes.

Prof. KERRY.—The ones that were open at the bottom did not line well ? What was the power of the jacks that was needed to force these—the ordinary screw jacks ?

Mr. KINLOCH.—It took different power at different places. It depended on when they were jacked and where they were jacked. We usually used a 25-ton Norton jack.

Prof. KERRY.—Was it hard jacking them ?

Mr. KINLOCH.—Yes, pretty hard to jack them.

Prof. KERRY.—It varied, I suppose ?

Mr. KINLOCH.—Yes, it varied at different points.

Prof. KERRY.—Did you ever have to use more than one jack ?

Mr. KINLOCH.—We always had to use two—one to hold each rib.

Mr. HOLGATE.—In this succession what was the next matter that came to your attention ?

Mr. KINLOCH.—The same chord again—No. 8 chord. I went down next day or the day after that, and I imagined it was getting worse.

Mr. HOLGATE.—That was the 21st or the 22nd of August ?

Mr. KINLOCH.—It was a couple of days after or the next after—I do not remember which. One of the Indians was there and I asked him if he noticed anything about it and he said it did not look to him like it was bent like that before. I asked him if he had noted anything peculiar, and he said no. I asked him if he was sure it had not been bent before and he said no.

Prof. GALBRAITH.—Are you now speaking of the bend in the side plates ?

Mr. KINLOCH.—In chord 8—not in the side plates but in the body of the chord itself.

Prof. GALBRAITH.—Along the ribs ?

Mr. KINLOCH.—Yes, sir.

Prof. GALBRAITH.—The point that you now speak of is one that you had seen before but which seemed to have increased ?

Mr. KINLOCH.—Yes, sir ; it looked that way to me.

Prof. KERRY.—What was the Indian's name ?

Mr. KINLOCH.—I cannot remember about it, whether it was Morris or Elm.

Prof. KERRY.—Were they in the accident ?

Mr. KINLOCH.—Morris was killed and Elm is alive yet. I did not know them apart very well.

Mr. HOLGATE.—What appearance did it have on this second inspection ?

Mr. KINLOCH.—Just about the same, only I thought I was nervous and was seeing more than really was there.

Mr. HOLGATE.—Did the bend confine itself to any particular rib or did it cover the whole chord ?

Mr. KINLOCH.—All four ribs were bent, but they were not bent alike.

Mr. HOLGATE.—In which direction were they bent ?

Mr. KINLOCH.—Three of them at the top were bent towards Montreal, and down part way they were bent towards Quebec, and the inside rib was bent towards Montreal, but very slight.

Prof. KERRY.—That is the rib on the Montreal side of the Quebec chord ?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Do I understand that description to mean that it would bring a wind on the chord ?

Mr. KINLOCH.—No, the bend crossed. It would be the shape of a long letter S or a question mark.

Mr. HOLGATE.—That would mean then that the space between the ribs on the Montreal side of the chord would be increased at the bend ?

Mr. KINLOCH.—Increased at the bottom or decreased at the top, or about the same at the top.

Mr. HOLGATE.—Then, was there anything observable in the lacing ?

SESSIONAL PAPER No. 154

Mr. KINLOCH.—No, sir, I did not notice anything, but I did not look particularly, any more than there was not enough to notice just looking off-hand. I did not sight over the lacing; I just walked over it and looked at it.

Mr. HOLGATE.—You did not make any test whatever?

Mr. KINLOCH.—No, sir.

Prof. GALBRAITH.—What do you mean by towards the top and towards the bottom in that answer?

Mr. KINLOCH.—In the bottom, I call that the field splice between 8 and 9, and the top would be the field splice at 7 and 8.

Prof. GALBRAITH.—In other words, you call the higher end of the chord the top and the lower end the bottom?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—That brings us up to the 21st or 22nd of August. Now, then, continue on further?

Mr. KINLOCH.—Well, I kept very close watch on these chords to see if there was any further movement in them.

Mr. HOLGATE.—You are referring to——?

Mr. KINLOCH.—Chords 8, 9 and 10 in the cantilever arm, particularly 8 and 9. I did not pay much attention to 10—on the Quebec side. I was not seriously alarmed about them, but I kept my eye on them to see what they were doing if there was anything.

Mr. HOLGATE.—Did you frequently see them afterwards?

Mr. KINLOCH.—Three or four times a day.

Prof. KERRY.—Are they to any extent visible at low tide now?

Mr. KINLOCH.—No, 9.

Prof. KERRY.—No, 8 is not?

Mr. KINLOCH.—No.

Prof. KERRY.—No, 10?

Mr. KINLOCH.—No, 10 is visible but it is destroyed; you cannot tell anything about it.

Prof. GALBRAITH.—What do you mean by saying that it is destroyed?

Mr. KINLOCH.—It is all flattened down. It is on top of the pier and it is lying on its side and the members are lying one on top of the other. You cannot see anything at all only that it is just there.

Prof. GALBRAITH.—And No. 9?

Mr. KINLOCH.—No, 9—you can see about half of it at low tide.

Prof. GALBRAITH.—It is in bad shape, is it not?

Mr. KINLOCH.—It does not look bad.

Mr. HOLGATE.—On these several inspections were you accompanied by anybody?

Mr. KINLOCH.—No, sir.

Mr. HOLGATE.—Did anybody else go down after the 22nd?

Mr. KINLOCH.—I have no personal knowledge, but I think Mr. Birks went there.

Mr. HOLGATE.—Did you notice any change yourself in any of them?

Mr. KINLOCH.—No, sir.

Mr. HOLGATE.—Yes?

Mr. KINLOCH.—That was Tuesday before the accident.

Mr. HOLGATE.—What date was that?

Mr. KINLOCH.—The 27th. I discovered this bend in chord A-9-L anchor arm.

Mr. HOLGATE.—What time of the day was that?

Mr. KINLOCH.—About 9 o'clock.

Mr. HOLGATE.—When previously had you been on that chord?

Mr. KINLOCH.—Saturday is about the last time I can remember being there.

Mr. HOLGATE.—The previous Saturday?

Mr. KINLOCH.—Yes.

Mr. HOLGATE.—But it was not until Tuesday that you noticed it?

Mr. KINLOCH.—No, sir. As I turned around the post——

7-8 EDWARD VII., A. 1906

Mr. DAVIDSON.—I would like you to ask Mr. Kinloch, if, on the Saturday previous, he examined it sufficiently to see whether there was any bend in it?

Mr. HOLGATE.—Are you in a position to say that there was any bend in the chord on the Saturday?

Mr. KINLOCH.—I did not notice any. Mr. Yenser and Mr. Birks were down at the foot of lower 10 chord and as soon as I saw it I called them up there. It was apparently, to me, quite alarming. It was a big bend and I was satisfied right off that there was something going on.

Prof. GALBRAITH.—That is on the same side of the bridge?

Mr. KINLOCH.—9-L anchor arm.

Prof. GALBRAITH.—Where were Birks and Yenser?

Mr. KINLOCH.—Down below—right below at the chord and the shoe—10-L. They came up and looked at it. I guess we put in 25 or 30 minutes looking it all over. Mr. Yenser said when he came there: That has never been there before; I have been over this chord too many times. He started in to talk; he would not put up any more iron till he found out about it. Birks kind of laughed at him and said that he had better wait until he found out, that when he was condemning that chord he was condemning the whole bridge, and he said it might have been in there before. He said he better wait until he investigated it. Mr. Birks and I went up to the office and I went in and told Mr. McLure and we immediately went down and measured it—went right up and down, took measurements of the bend and examined everything—lacing and rivets—and looked the chord all over. At this time there was none of us noticed any bend in the field splice.

Prof. GALBRAITH.—Between—?

Mr. KINLOCH.—Between 8 and 9. There was considerable talk as to what they would do by Birks, Yenser, myself and McLure, as to how serious it was, as to what the stress on the chord was, and one thing and another; Mr. McLure can probably give these figures better than I can, but it was finally decided that they would not move out the traveller until they got some word. I do not know who decided it, but that was the general supposition when we got through. We also went over and measured 8 and 9 chords on the cantilever arm and talked about them. We passed No. 10 up; we did not measure it because it was not near as bad as the one on the anchor arm and the other two in the cantilever arm. Mr. McLure called up Mr. Hoare and he came out in the—no, he went in that night and Mr. Hoare came out next day.

Mr. HOLGATE.—Mr. McLure went in that night to Quebec?

Mr. KINLOCH.—Yes, he went in to see Mr. Hoare that night and he called him up that afternoon on the telephone, I think. He can tell you better himself than I can.

Prof. KERRY.—Did you make any examination of No. 9 chord in the anchor arm on the Quebec side at that time?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—And it was all right?

Mr. KINLOCH.—Yes.

Prof. KERRY.—No visible defects?

Mr. KINLOCH.—No visible defects. We also at the same time that afternoon and next morning examined thoroughly all the compression members and all the tension members; in fact, we gave the bridge a thorough inspection all over. That was on Mr. Hoare's orders. First we went at it ourselves and then Mr. Hoare called me up and told me to make a thorough examination of everything all over, which I did—I on the bottom, and Mr. McLure on the top.

Prof. KERRY.—You had just found three members which showed marked peculiarity?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—9-J in the anchor arm and 8-R and 9-R in the cantilever arm?

Mr. KINLOCH.—Yes, sir. Wednesday morning when we came out I was out at the front about fifteen minutes after seven and I saw that they were loosening the traveller to run it ahead. I talked to the assistant foreman and told him that they

SESSIONAL PAPER No. 154

were not going to move the traveller, and he said that he had orders to do it. I asked him who gave him the orders and he said Mr. Yenser. I started back to hunt up Mr. Yenser and I met Mr. McLure on the approach span and I asked him if he knew that they were moving the traveller and he said yes. I said: How about it? And he said: I do not know, only Ben said that he had a dream last night. I said: That is kind of funny. He said: Ben says he has got too many men out.

Prof. GALBRAITH.—On the work?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—What did he mean by that?

Mr. KINLOCH.—I suppose that he meant that he had too many men to work on the traveller and could not work them unless he was raising steel, but I did not see Mr. Yenser to talk to him that day about moving out the traveller. But the traveller was moved out.

Mr. HOLGATE.—You are referring now to the smaller traveller?

Mr. KINLOCH.—Yes, sir. On Wednesday I went over all these chords several times and I did not notice any change. There was no iron added Wednesday at all; there was more taken off than put on on account of moving the traveller. They were taking stuff off all the time. Thursday they put in temporary track stringers. I guess they had them finished up about eleven o'clock and about noon or right after dinner two sections of the bottom chord of the suspended span were run out.

Prof. GALBRAITH.—No. 4 panel?

Mr. KINLOCH.—Yes, sir—and hooked on to and slacked over into place to be joined. Just about 15 or 20 minutes before the accident they had this chord straight and in position to put in the bolts. They had a few bolts in on each side.

Prof. KERRY.—That is at the joint between the 3rd and 4th panels?

Mr. KINLOCH.—Yes, the 4th panel field splice. There was one chord of diagonal bars with their attachments ready to be erected on the temporary track stringers when I left there. I came in on the approach span and the others for the upstream side were on the car there. I marked them with their spacing and I should judge that they had just about time to get to the end when the accident happened.

Prof. KERRY.—They were being pushed out by the locomotive?

Mr. KINLOCH.—Yes. The locomotive had one car between it and the bars. They came by—there was a small gang on the second panel of the anchor arm letting down the erecting material from the big traveller. They had one small piece on there and the engine was away to get that car on the track to come in and make the switch. They had to come in and get the other car and push it out ahead of them.

Prof. KERRY.—Can you tell us about your inspection of Wednesday? To the best of your knowledge, who inspected these chord sections on Wednesday, at what time and what was the observation and discussion?

Mr. KINLOCH.—I think I inspected them about three times in the morning and three times in the afternoon. I know I met Mr. Birks twice when I was on my trip doing the same thing.

Prof. GALBRAITH.—Your main attention was given to the lower chords?

Mr. KINLOCH.—Yes, sir; practically the whole of it, but we were watching all these joints. On Wednesday Mr. Birks came to me and said: 'I think I have discovered where we have made big fools out of ourselves, or at least, I think I have anyway; I see what is the matter now. He said: That bend runs up to the field splice. I said: Do you know when that was riveted? I said: I can tell within a day or two.

Prof. GALBRAITH.—Are you speaking now of A-9-L?

Mr. KINLOCH.—A-9-L.

Prof. KERRY.—That would be the 8 and 9 field splice?

Mr. KINLOCH.—Yes, so, of course, I went down to look at the chord and I also hunted up the records. I found that the chord did show a bend running up, but not as much to the field splice. This No. 8 chord seemed to be straight, but No. 9 chord

7-8 EDWARD VII., A. 1908

curved into it some way, but the bend at the top was not as much as it was in the body of the chord. I did not measure it and I do not know whether Mr. Birks did or not.

Prof. KERRY.—That is to say, it would be as if the north end of No. 8 chord had got pushed towards Montreal a little bit.

Mr. KINLOCH.—No, it seemed to be straight.

Prof. KERRY.—As if the whole chord was straight the north end up a little towards Montreal, and the 9th chord had curved around in a circle to meet it.

Mr. KINLOCH.—No, it was not pushed towards Montreal. It did not appear to be. No. 8 chord appeared to be straight right to the splice and No. 9 chord seemed straight and then curved right at the splice.

Prof. KERRY.—The belly of the curve was in which direction?

Mr. KINLOCH.—In towards the centre of the truss.

Prof. KERRY.—Towards Quebec—?

Mr. KINLOCH.—Yes, sir.

Prof. GALBRAITH.—I understand you to mean this, that the bend in No. 9 extended from the foot of the member known as T-5-Z to the field splice between chords No. 9 and No. 8?

Mr. KINLOCH.—No, it extended from the cover plate south to T-5-Z.

Prof. GALBRAITH.—It extended from the cover plate to T-5-Z and the field splice between 9 and 8.

Mr. KINLOCH.—There was a very slight bend right at the cover plate, but there was practically none there.

Prof. KERRY.—Was the outside plate at the field splice between 8 and 9 bent?

Mr. KINLOCH.—Yes, it was deformed a little with a curve.

Prof. KERRY.—That is where the curve started?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—Did you say anything more about it at that time, Mr. Kinloch?

Mr. KINLOCH.—More in a kind of joking way with Mr. Birks in talking.

Prof. KERRY.—Who last inspected these chords during the day?

Mr. KINLOCH.—I do not know of anybody but Mr. Birks and myself. Whether Mr. Yenser went over them or not I do not know.

Prof. KERRY.—You did not notice any increased deflection?

Mr. KINLOCH.—No, sir.

Prof. KERRY.—Did Mr. McLure go over them?

Mr. KINLOCH.—Mr. McLure was in New York. He left at noon.

Prof. KERRY.—Did Mr. Hoare?

Mr. KINLOCH.—Mr. Hoare was up and looked at them—yes, sir.

Prof. KERRY.—But he did not go over them?

Mr. KINLOCH.—No, I do not think he did. I did not see him.

Mr. HOLGATE.—Could you make any inspection of a thing like that from the track?

Mr. KINLOCH.—I could see it quite plainly from the track, or Mr. Birks or Mr. McLure.

Prof. KERRY.—The traveller started to move out?

Mr. KINLOCH.—Early Wednesday morning they started to take the attachments off. It takes a long time to move the traveller; in fact, it takes almost a day to move it and fasten it down.

Prof. KERRY.—There was no general consultation after the one you had on Tuesday mornnig?

Mr. KINLOCH.—I do not recollect any now that I was in.

Mr. HOLGATE.—You say that Mr. McLure was away?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Do you know for what purpose he had gone away?

Mr. KINLOCH.—Yes, sir. He went to explain the matter to Mr. Cooper and get his advice on it.

Mr. HOLGATE.—When was the last inspection made of these chords?

Mr. KINLOCH.—I should say about four o'clock.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—On——?

Mr. KINLOCH.—Thursday, the 29th; that is the last close inspection.

Mr. HOLGATE.—By yourself?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—Any others?

Mr. KINLOCH.—I do not know of any others.

Mr. HOLGATE.—What was observed then different from what you had observed before?

Mr. KINLOCH.—I did not notice anything any different.

Prof. KERRY.—Did you discuss the matter with Mr. Birks and Mr. Yenser at all on Thursday?

Mr. KINLOCH.—Yes, Thursday morning, when we started to run the stringers out, I was out on the front when they came out and put them in—down underneath—and when I came up and saw them I came back. I should judge that was about eleven o'clock, or 10.30, or something like that. Mr. Birks met me on the anchor arm, and he says: Well, it is all right; I have got word from Phoenixville that they have a record that these chords were bent before.

Prof. KERRY.—Did he mention the chords?

Mr. KINLOCH.—No, sir.

Prof. KERRY.—What did you think he meant?

Mr. KINLOCH.—I thought he meant No. 9 chord.

Prof. GALBRAITH.—Both No. 9s were referred to?

Mr. KINLOCH.—No. 9 was the one that we were interested in and my mind centred on that one chord?

Prof. GALBRAITH.—A-9-L.

Mr. KINLOCH.—Yes.

Prof. GALBRAITH.—I think he spoke of chords in the plural?

Mr. KINLOCH.—He said chord. I laughed at him and told him that it was not, and he just went on. That is all that was said between us about it.

Mr. HOLGATE.—But when you inspected A-9-L, did you also inspect A-9-R?

Mr. KINLOCH.—Not so frequently as I had A-9-L.

Mr. HOLGATE.—I refer to the last time you inspected A-9-L.

Mr. KINLOCH.—No, sir.

Mr. HOLGATE.—When was the last inspection of A-9-R?

Mr. KINLOCH.—About eleven o'clock.

Mr. HOLGATE.—What day?

Mr. KINLOCH.—On the same day.

Mr. HOLGATE.—The 29th.

Mr. KINLOCH.—Yes, the day of the accident.

Mr. HOLGATE.—What did you find?

Mr. KINLOCH.—It seemed to be all right.

Mr. HOLGATE.—And the other chords that you mentioned?

Mr. KINLOCH.—They did not seem to be any worse at any time we measured them.

Prof. KERRY.—You have not said definitely, Mr. Kinloch, but are we to infer that in the discussions that took place your own opinion was that there was something serious the matter with the chords that you did not understand that required immediate attention?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—You did not depart from that position?

Mr. KINLOCH.—No, sir.

Prof. KERRY.—We also understand that you reported the matter personally to Mr. McLure on Tuesday morning?

Mr. KINLOCH.—He went down and helped to measure it at the same time.

Prof. KERRY.—It was reported to Mr. Hoare on Tuesday night?

Mr. KINLOCH.—Tuesday afternoon.

7-8 EDWARD VII., A. 1908

Prof. KERRY.—And you went over the bridge with Mr. Hoare on Wednesday?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—Did either of these gentlemen give you any instructions about it?

Mr. KINLOCH.—No, sir. Mr. Hoare gave me some instructions, or asked me if I had been over the rest of the bridge and told me to keep a close watch of the different members; asked me particularly about the lateral joints, and if I could see any deformation any place else.

Prof. GALBRAITH.—Did you observe anything wrong in the laterals—the sway braces or any cross connections?

Mr. KINLOCH.—No, sir. The cross strut at that point—

Prof. GALBRAITH.—That is at—?

Mr. KINLOCH.—At the foot of P-4 post—had a bend in it close to the east truss that had always been there, of about half an inch. It was a box girder, and it was bent in both webs.

Prof. GALBRAITH.—The cross piece is not the floor beam?

Mr. KINLOCH.—No, it acts as a truss.

Prof. KERRY.—The floor beams were all in place?

Mr. KINLOCH.—Yes, the floor beams were all in place.

Prof. GALBRAITH.—At which place?

Mr. KINLOCH.—At that place.

Prof. KERRY.—On the anchor arm?

Mr. KINLOCH.—On the anchor arm and cantilever arm.

Prof. KERRY.—Were in place and riveted?

Mr. KINLOCH.—Not all riveted on the cantilever arm.

Prof. KERRY.—But all riveted on the anchor arm?

Mr. KINLOCH.—Yes.

Prof. KERRY.—What was the condition of the stringer system of the anchor arm?

Mr. KINLOCH.—The stringer system was incomplete in three or four panels before the fixing of the tracks for erection purposes and they were using the stringers that belonged there at other places.

Prof. KERRY.—Which three or four panels particularly?

Mr. KINLOCH.—Panels 10 and 9 to 8—7 I do not know—I am not sure about that, but instead of the stringers being in their places, they used the electric railway stringers to carry the track and roadway. The stringers were doubled up and underneath there was a blocking on top of the floor beams to carry the erection track.

Prof. KERRY.—That would be wooden blocking?

Mr. KINLOCH.—Yes.

Prof. KERRY.—The stringers would rest on top of this wooden blocking?

Mr. KINLOCH.—Yes, sir.

Prof. GALBRAITH.—I should like to make sure about this strut between the feet of posts 4. What is the amount of the kink or bend there, close to the east truss that you mentioned?

Mr. KINLOCH.—It was a bend like that (indicating), it had been there all the time.

Prof. GALBRAITH.—Was it there before it had been put into the bridge?

Mr. KINLOCH.—Yes, evidently in the shop.

Prof. GALBRAITH.—In the shop, it was not due to stress?

Mr. KINLOCH.—No, sir.

Prof. GALBRAITH.—What was the extent lengthwise?

Mr. KINLOCH.—It came in about one lacing panel.

Mr. HOLGATE.—How far was that lacing panel from the chord?

Mr. KINLOCH.—Very close, I should say now just off-hand, 8 inches, 8 or 10 inches.

Mr. HOLGATE.—It was not a general bend in the whole member?

SESSIONAL PAPER No. 154

Mr. KINLOCH.—No, it was a short bend, it was all taken up in there, almost like an off-set.

Prof. GALBRAITH.—And it was a shop bend, you think?

Mr. KINLOCH.—Yes, I know it was a shop bend.

Prof. GALBRAITH.—How did that pass inspection? You cannot answer?

Mr. KINLOCH.—No, sir.

Prof. KERRY.—And how would the deflection in chord 9-L pass inspection?

Mr. KINLOCH.—In chord 9-L?

Prof. KERRY.—Mr. Birks' statement was correct that the mill had a record of it, and that it was a shop deflection?

Mr. KINLOCH.—I do not see how it could.

Prof. KERRY.—In your final inspections, Mr. Kinloch, you were watching for all evidences of any movement among the different parts, of course, were you not?

Mr. KINLOCH.—Yes, sir, particularly those chords in the shoes.

Prof. KERRY.—Did you notice any change in the lacing anywhere?

Mr. KINLOCH.—No, sir. Except that lacing No. 9-L chord was strained awful high. Both times that we were down there, the time Mr. Yenser and Mr. Birks and myself were down there I tested the lacing with my hammer, and they sang as if they had an awfully good pull on them, and again when Mr. McLure and myself were down we examined those lacings very carefully, especially in chord A-9-L, and both top and bottom were examined, every rivet we looked to see if there was any bend or if it was cracked any place, if they were humped or sagged or bent in any direction, and we could not discover any evidence that they were distorted the least bit with the exception of one loose rivet.

Prof. KERRY.—Taking any one of the chords in that lacing, were both members strained or was one tight and the other loose?

Mr. KINLOCH.—My recollection is that they were all strained, they all sounded high.

Prof. KERRY.—Both arms of the 'X' and the straight cross piece as well?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—And the riveting was all in good condition with the exception of this one loose rivet.

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—Are you clear as to whether that rivet had always been loose or not?

Mr. KINLOCH.—No, sir, I know positively it was tight before.

Prof. KERRY.—How long before?

Mr. KINLOCH.—You mean how long was I sure it was tight before?

Prof. KERRY.—Yes.

Mr. KINLOCH.—I could not say that but I know it was tight that one time, because I have tried it several times.

Prof. KERRY.—You made an inspection of it?

Mr. KINLOCH.—The reason is there had always been a little short chain bend in it and I always watched it. I remember doing it two or three times, but would not say whether it was a month or two weeks before the accident.

Prof. GALBRAITH.—Which rivet was this?

Mr. KINLOCH.—The rivet in the west centre rib in that cross angle.

Mr. HOLGATE.—In the angle running at right angles to the chord?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—That was a shop rivet?

Mr. KINLOCH.—No, that was a field rivet, that angle had been cut off and put on again.

Mr. HOLGATE.—Can you locate the last rivet referred to?

Mr. KINLOCH.—It is the second tie angle down from the cover plate over splice 8 and 9, and it is in the west centre rib, the only one rivet there.

7-8 EDWARD VII., A. 1908

Prof. GALBRAITH.—What do you mean by the tie angle?

Mr. KINLOCH.—The cross angle.

Prof. GALBRAITH.—A straight one?

Mr. KINLOCH.—The straight one that crosses.

Prof. GALBRAITH.—It is in that piece and in the west centre rib.

Mr. KINLOCH.—Yes, sir.

Prof. GALBRAITH.—You said that that rivet was a field rivet; how did that happen?

Mr. KINLOCH.—There were some angles that we cut off at the time it was repaired and replaced.

Prof. KERRY.—So far as you know, Mr. Kinloch, after the discussion as to the advisability of moving out the traveller, there was no definite action taken in the way of saying either that the traveller should be moved out or that the traveller must not be moved out by any officer of the Quebec Bridge Company.

Mr. KINLOCH.—No, sir, I do not know of any.

Prof. KERRY.—Do you know, Mr. Kinloch, what grounds Mr. Yenser had for deciding to move the traveller out on Wednesday morning, when it had been understood on Tuesday towards noon, that it would not be moved until he got specific orders?

Mr. KINLOCH.—No, sir, I do not.

Prof. KERRY.—So far as you know, no instructions concerning that chord reached Mr. Yenser in that time?

Mr. KINLOCH.—You mean from Phoenixville?

Prof. KERRY.—From any source?

Mr. KINLOCH.—I do not know.

Prof. KERRY.—Do you know if he got any information from anywhere.

Mr. KINLOCH.—I do not know a thing about it.

Prof. KERRY.—You had absolutely no communication with him, and know nothing of his reasons?

Mr. KINLOCH.—No, sir, I did not speak to him about it at all.

Prof. GALBRAITH.—Did you ever hear why he removed it before he received instructions?

Mr. KINLOCH.—No, sir.

Mr. STUART.—I understand that Mr. Birks had made some calculations as to the additional strain that would be put on the structure if it were moved, both Mr. McLure and Mr. Birks. I understand that was done and the results were communicated to Mr. Yenser?

Prof. KERRY.—Can you produce evidence of that?

Mr. STUART.—Mr. McLure will be able to give evidence of that.

Mr. KINLOCH.—Mr. McLure and Mr. Birks made some calculations, but I do not know whether that influenced him to move the traveller or not. They made calculations that it would only increase the stress in that No. 9 chord a certain per cent, but he was still of the opinion after the calculation was made that something was seriously wrong there.

Prof. KERRY.—You know that definitely?

Mr. KINLOCH.—Well, that was his talk.

Prof. KERRY.—You mean you heard the talk yourself?

Mr. KINLOCH.—Yes, sir.

Prof. GALBRAITH.—You heard him say so?

Mr. KINLOCH.—Yes, sir, we were talking together.

Prof. KERRY.—You also know, from what you have heard of the general conversation, that it was clear to everybody that the moving forward would increase the strain on the member?

Mr. KINLOCH.—Yes, sir, they have the figures for that, Mr. McLure.

Prof. GALBRAITH.—The engineer would probably make the calculations to determine the increase in stress for each time the traveller was moved out! Do you know whether that was the practice or not?

Mr. KINLOCH.—Well, Mr. McLure can tell you more about that.

SESSIONAL PAPER No. 154

Prof. KERRY.—Do you know to what extent the condition of the chords was a matter of general knowledge among the bridge men, and on what dates?

Mr. KINLOCH.—Well, I guess Wednesday after we had measured there was a general talk among a good portion of them, although some of them did not know it next morning, when they moved the traveller out. I spoke to Worley, and he did not know of it. That was Wednesday morning, and we measured Tuesday. I also spoke to his assistant foreman, I do not know what his name is, his nickname is 'Frenchman.' I had a number of men ask me about it as I was going around; they asked me and would say: How about that chord? But they all generally were referring to the chord in the cantilever arm.

Mr. STUART.—Worley's ignorance would be accounted for by the fact that he was not there on Tuesday, he was sick?

Prof. GALBRAITH.—Which of these chords do you think the men feared the most, or talked most about?

Mr. KINLOCH.—Most of the inquiries they made of me referred to the chords in the anchor arm.

Mr. HOLGATE.—Was this a matter of general conversation?

Mr. KINLOCH.—It would not be with me, but among the riveters—

Mr. HOLGATE.—Amongst the men?

Mr. KINLOCH.—I cannot say, as I was not mixed up with any gang, but I know a good many asked me about it, so I presume it must have been.

Prof. KERRY.—Did any officials of the Canadian government visit the bridge for inspection purposes?

Mr. KINLOCH.—There is a Mr. Johnston.

Prof. KERRY.—There is a Mr. Johnston, yes, connected with the government?

Mr. KINLOCH.—He has been out there I do not know how many times.

Prof. KERRY.—Officially?

Prof. KERRY.—I suppose he was official.

Mr. HOLGATE.—Alone?

Mr. KINLOCH.—No, I think Mr. Hoare was with him both times, if I am not mistaken, that I saw him.

Prof. KERRY.—That is to say, the visits were very rare?

Mr. KINLOCH.—I do not know; lots of times I would be on shore for half a day at a time. He might be there and go and I not know.

Prof. KERRY.—If a man was coming out to inspect the bridge and you were on the bridge you would probably see him, would you not?

Mr. KINLOCH.—I think I would, yes.

Prof. KERRY.—What I wanted to get at was whether there was any regular outside inspection system existing that you know of. There would be then no one with the exception of the inspectors of the Quebec Bridge Company and the officers of the Phoenix Bridge Company who would be in a position to know anything that was happening?

Mr. KINLOCH.—No, I do not think so.

Mr. HOLGATE.—When Mr. Johnston visited the bridge, what sort of an inspection did he make?

Mr. KINLOCH.—Well, sir, I do not think he made much of an inspection. He did not come out, he was down on the ground and did not come out to see; he could not climb on a span.

Mr. HOLGATE.—Did you ever accompany him through the structure?

Mr. KINLOCH.—No, sir.

Prof. KERRY.—Have you told us now of every defect that has come to your notice, Mr. Kinloch, to the best of your recollection?

Mr. KINLOCH.—I think I have; I do not think I can remember any more.

Mr. STUART.—Mr. Haley, in his evidence, is reported in this way: '(The witness indicated the splice marked No. 9 on the Quebec side of the cantilever arm of the

7-8 EDWARD VII., A. 1908

lower chord.)' Later on he said that it was bulging out on both sides. I would like to ask Mr. Kinloch what was the condition of that particular piece, whether it was bulging on both sides.

Mr. HOLGATE.—It has been stated, Mr. Kinloch, that the splice on the chord No. 9 on the Quebec side of the cantilever arm was found to be bulging out on both sides?

Mr. KINLOCH.—It is the same joint I described.

Mr. HOLGATE.—It is the joint between 8 and 9, and the witness says it was bulging. He was asked: 'What was bulging actually? What part of the splice? And the witness said: 'All the webs and the chord. There were four webs in this chord, two outside ones and two centre ones; they were all giving way. The two outside ones were going out.'

Mr. STUART.—He also says that the inside web was bending. What I want to know is whether that is an accurate statement, whether the webs were bending in a different way, one towards Montreal, and one towards Quebec, which of course does not correspond with that?

Mr. KINLOCH.—It does to a considerable extent. The only difference I can see in Haley's and mine is that Haley said it occurred in both, and mine only in the one, No. 8.

Mr. STUART.—He says there is a bend in the web and not in the splice at all; he says the inside web was bending towards Montreal.

Mr. KINLOCH.—That is in the web.

Mr. STUART.—As I understand, he is not speaking of the splice, but of the web later on.

Mr. HOLGATE.—Do you agree with Mr. Haley's description of the bends in chord No. 8-R in the cantilever arm?

Mr. KINLOCH.—No, sir.

Mr. HOLGATE.—As shown on Exhibit 27-B?

Mr. KINLOCH.—That is this bend here (indicating), the shape of it is what you mean; I do not agree with it. The difference between Haley's description and mine is that my bend goes in there (indicating) and he has a straight bulge out on both chords, and mine bulges out at the end the way I understand it.

Mr. DAVIDSON.—Mr. Haley simply intended to indicate, I take it, by this line here (indicating) that on this side of this web there was a bulge outwards; you see that is down the river towards Quebec, that on that side of this web there was a slight bulge outwards towards Montreal. This does not mean at all that it is as large as these two lines indicate (pointing to Exhibit 27-B).

Mr. HOLGATE.—Did not Mr. McLure make accurate measurements of that chord?

Mr. KINLOCH.—From the cover plate only, and Mr. Birks.

Mr. HOLGATE.—We will call on Mr. McLure later to produce the exact figures. You were speaking of the inspection of the work just now, Mr. Kinloch, can you say how often Mr. Hoare inspected the work?

Mr. KINLOCH.—No, I cannot.

Mr. HOLGATE.—Was it frequent?

Mr. KINLOCH.—Yes, he was out there at least once a week. Some weeks he would be out there pretty near every day, and I suppose there have been weeks when he has not been out once.

Mr. HOLGATE.—On these inspections would he accompany you over the structure?

Mr. KINLOCH.—Sometimes me and sometimes Mr. McLure, whichever one happened to be at leisure at the time.

Mr. HOLGATE.—And was that an inspection of the structure or an inspection of the structure made from the track?

Mr. KINLOCH.—An inspection of the structure made from the track and inquiry from us how things were getting on in regard to different points.

Mr. HOLGATE.—Was the method of erection of the anchor arm clearly stated in the blue prints that were prepared in advance by the Phoenix Bridge Company?

SESSIONAL PAPER No. 154

Mr. KINLOCH.—Yes, sir, they were changed in some details only.

Mr. HOLGATE.—Were those instructions carried out with those exceptions as far as you know?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—And you were there all the time?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—And did the work of erection show that the plans were ample?

Mr. KINLOCH.—Yes, sir. It was an excellent good rig for doing the work.

Mr. HOLGATE.—And what were these small exceptions that you referred to?

Mr. KINLOCH.—Why, in setting the first steel, some of the lighter members, they had some of the heavier blocks detailed to drift them over; the particular changes that we noticed were in this; instead of using these blocks that took an hour or an hour and a half to take off, they drifted them over with small tackle.

Mr. HOLGATE.—That was just something that might arise?

Mr. KINLOCH.—Through the work. Pretty nearly everything was covered in the plans as first got out, the hooking on of every set of appliances was shown exactly and the position of it and what you had to use; in fact you had simply to follow instructions and the thing would get there itself if you followed the lines laid down.

Mr. HOLGATE.—Then the instructions were sufficiently minute with regard to the placing of the lower chord system, to enable the working gang to do the work with precision?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—That applies generally to the whole of the anchor arm, and would you say that the same applied to the whole of the structure?

Mr. KINLOCH.—Yes, I do not know of any changes; if they were made they were very minor.

Mr. HOLGATE.—Would it be a big job or a small job to lay out beforehand all these detail processes?

Mr. KINLOCH.—It must have been an awful job.

Mr. HOLGATE.—Complicated?

Mr. KINLOCH.—Very complicated, yes, sir. The erection was practically all done in the office before it was put in the field. It must have taken a year of preparation to get the plans out because every single member had its own plan, where it was to be hooked on and what falls were to be used, and when one set of falls was to be taken off and another put on. All these little things were gone into minutely, especially on the important members, and they had special attachments for moving everything figured out; they did not go by guess on anything except the very lightest members, such as the truss floor beams, and things like that that weighed less than five tons.

Prof. KERRY.—You could say that the men who prepared those plans thoroughly understood bridge erection?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—And gave their very best ability to preparing the plant and the plans for that erection?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—When you speak of the plant, you mean what, the travellers and all the handling apparatus?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—And that was included in your description of the general scheme as being well designed?

Mr. KINLOCH.—Yes, sir, I criticised the o'electric hoists in the start-off, I did not like them, but they panned out to be all right.

Mr. HOLGATE.—All the handling machinery was there that was required?

Mr. KINLOCH.—Yes, sir, in abundance.

7-8 EDWARD VII., A. 1908

Mr. HOLGATE.—And was there anything that was required for the carrying out of the work that was not used ?

Mr. KINLOCH.—I cannot think of anything that I could have done any better with.

Mr. HOLGATE.—In other words, the whole ground you think had been fully covered ?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—And would you put it in this way, would you say that all contingencies had been provided for ?

Mr. KINLOCH.—I think that would be a very good way to express it.

Mr. HOLGATE.—Notwithstanding that it was an exceptional piece of work ?

Mr. KINLOCH.—Well, if it had not been an exceptional piece of work it would not have required all that preparation.

Mr. HOLGATE.—Then, notwithstanding its exceptional character, everything had been fully provided for in your opinion ?

Mr. KINLOCH.—It had ; right on the ground they had Mr. Birks who was the—

Mr. HOLGATE.—I am speaking of the plans and appliances.

Mr. KINLOCH.—I am speaking of him because he was capable of getting them out on a moment's notice. He was the best man on erection I ever saw.

Mr. HOLGATE.—Mr. Birks was ?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—With regard to the progress of riveting, Mr. Kinloch, did you make reports ?

Mr. KINLOCH.—Only daily to Mr. McLure.

Mr. HOLGATE.—Were they in writing or did you just give him a memorandum at the end of the day ?

Mr. KINLOCH.—I gave him a memorandum at the end of the day, they were in a book, and he copied them off into a diary.

Mr. HOLGATE.—Not a formal report.

Mr. KINLOCH.—No, just how many gangs were riveting and how many rivets they drove.

Mr. HOLGATE.—So if any report exists on riveting it would contain the information you gave to Mr. McLure ?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—When joints were bolted up, Mr. Kinloch, whose instructions were necessary in order that the riveting might be commenced and carried out ?

Mr. KINLOCH.—Mine.

Mr. HOLGATE.—From whom did you get those instructions ?

Mr. KINLOCH.—Why, the little green books of the Phoenix Bridge Company had the general instructions for riveting.

Mr. HOLGATE.—But as to the time when that should be done ?

Mr. KINLOCH.—That was at my own discretion.

Mr. HOLGATE.—That was left to your judgment ?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—How did you understand that that responsibility devolved on you ?

Mr. KINLOCH.—It devolved on me only this much, that I was to judge of when a certain condition existed in a member. The orders were to rivet certain members when they came in perfect contact, and I was the judge of when they were in perfect contact. They could not be riveted before they were in perfect contact, so I generally called Mr. McLure in on a matter before we riveted.

Mr. HOLGATE.—You understood that as part of your duty then ?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—As to parts in the field joints near their final position, did you find it necessary from time to time to change the bolts from a smaller to a larger size ?

Mr. KINLOCH.—In some of the members, yes, sir. Not all of them.

SESSIONAL PAPER No. 154

Mr. HOLGATE.—Have you any reason why it was not general?

Mr. KINLOCH.—Well, it depended a good deal on where the member was and what sized bolts were in it before.

Mr. HOLGATE.—Then was it the rule that the smaller bolts had to be used first?

Mr. KINLOCH.—Put in just as big a bolt as they could get in the hole.

Mr. HOLGATE.—Then was the inspection frequent enough and complete enough to detect the time at which these bolts should be changed?

Mr. KINLOCH.—Well, there was no movement you know, the movement all came you might say together, when it began to pick and from that forward.

Mr. HOLGATE.—That is there was a regular movement as the work progressed on the cantilever arm?

Mr. KINLOCH.—After a certain period, no, sir; there was not much movement until we got quite a way out, I forget exactly which panel. Mr. McLure can tell you that, but the joints commenced to close and really it is hard for me to remember that. It is all down in record and you can get it better from Mr. McLure than I can give it to you.

Mr. HOLGATE.—Was there always a sufficient force of riveters on the work?

Mr. KINLOCH.—Oh, yes, sir, on this work the riveting was on the bottom chord, mostly all compression members, very few tension members, and as far as I was personally myself concerned, I would just as soon not have seen any of it riveted up to now, outside of a few tension members in the bridge.

Mr. HOLGATE.—So at any rate there was no lack of riveters?

Mr. KINLOCH.—Oh, no, they always had men. They used to work them into other work, they were always there to fall back on to replace men in the raising gang, if a man in the raising gang should stop work they could take a few from the riveting gang.

Mr. HOLGATE.—There was always a sufficient number of riveters to keep the raising gang full?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—After the wreck of the bridge, Mr. Kinloch, I understand that you identified certain members and marked them prior to their being photographed?

Mr. KINLOCH.—Yes, sir, I helped.

Mr. HOLGATE.—You are sure that the identification, as far as it went, was correct?

Mr. KINLOCH.—With one exception.

Mr. HOLGATE.—Which was that?

Mr. KINLOCH.—That is that the picture marked chord 9-L west rib should be west centre rib. That is on that photograph. It should be west centre rib A-9-L (Photograph was marked in accordance with Mr. Kinloch's directions.) That is correct.

Mr. HOLGATE.—I will put in this series of 24 photographs. (Photographs put in and marked Exhibit No. 84.) You assisted in taking the photographs numbered Exhibit 34?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—I understand that you took certain photographs yourself?

Mr. KINLOCH.—Yes, sir.

Mr. HOLGATE.—These 21 photographs (referring to a number of photographs) are the ones you took yourself?

Mr. KINLOCH.—Yes, sir.

(Photographs put in and marked Exhibit No. 85.)

Mr. HOLGATE.—We are through with Mr. Kinloch.

Mr. DAVIDSON.—There is one point on which I would like a question to be put to Mr. Kinloch: Has he formed any opinion as to the point at which the break occurred in the bridge when it fell.

Mr. HOLGATE.—No, I won't ask that.

Mr. DAVIDSON.—Of course, it is a suggestion to the Commission.

Mr. HOLGATE.—We must form our opinion on the evidence we get.

Mr. DAVIDSON.—What occurs to me is this : Mr. Kinloch is a gentleman of wide experience in this kind of work. Although not an engineer he certainly must have acquired a vast amount of knowledge and he has shown that he has done so in his examination. He is intimately connected with this work, he actually saw the bridge fall and as a matter of fact he has already stated at the coroner's inquest, where in his opinion, this break occurred. I can quite conceive that it would not in any way bind the Commissioners. It would simply be an expression of opinion by him in no way binding upon the Commissioners in arriving at a conclusion as to where that break occurred. At the same time it does appear to me that it would be useful to have the opinion of a man like Mr. Kinloch on that point, who was an eye-witness to the fact.

Mr. HOLGATE.—If we can see anything to assist us in asking Mr. Kinloch's opinion, Mr. Davidson, we will not hesitate to ask him, but you can see from the nature of the examination of Mr. Kinloch, that we have tried to extract everything he knows.

Mr. DAVIDSON.—Certainly, there is no doubt about that.

Mr. HOLGATE.—And short of asking him the question you have just asked, we have asked him pretty nearly everything; so that we feel that we have the benefit of Mr. Kinloch's knowledge of the conditions and we also feel that he has not kept anything from us.

Mr. DAVIDSON.—I do not think he has.

Mr. HOLGATE.—Let us leave that entirely as it stands, Mr. Davidson, for a little while. If there is any object to be gained by asking Mr. Kinloch that at a later period we will do so. At the present time I think it would be out of place.

Mr. DAVIDSON.—All right, sir.

Witness retired.

Mr. HOARE, recalled :

Mr. HOLGATE.—Here are some documents from your company. Can you deposit those ?

Mr. HOARE.—I will deposit this agreement between the Government of the province of Quebec and the Quebec Bridge Company of the 27th November, 1900 (Agreement filed and marked Exhibit No. 36), and this agreement between the City of Quebec and the Quebec Bridge Company dated September 22, 1900. (Agreement filed and marked Exhibit No. 37.)

Witness retired.

Commission adjourned to meet to-morrow (Saturday) at ten a.m.

TWELFTH DAY.

QUEBEC, Saturday, September 21, 1907.

The Commission resumed at ten a.m.

Mr. KINLOCH, recalled :

Prof. KERRY.—Mr. Kinloch, we have evidence here that was given by a witness—Delphis Lajeunesse—which we do not quite fully understand. Perhaps you could explain to us just what the witness was doing at that time. I will read you over his evidence first of all. The evidence as quoted here is not exactly my recollection of what Lajeunesse said. He told us that he was bolting

SESSIONAL PAPER No. 154

on some splice bars and was standin gup on top of a wooden box for the purpose of hitching on his tackle to lower a box of tools down to his brother who was down below him. There came a sudden jerk on the bridge and he was thrown down in the box that he was standing on. He got up and turned around and looked at the traveller and saw that the traveller was standing there all right; then, he looked at the Quebec truss of the anchor arm and he saw that it was falling towards Quebec. Then, the whole bridge fell and he hung on to the bridge and retained his place until it got down. As a matter of technical fact indicating the character of the failure the evidence is very important, and if you would describe to us just as nearly as you can make out exactly what he was doing at the time it would assist us.

Mr. KINLOCH.—The only splice where it is riveted there is what we call a little buck brace or cross frame for a stiffener inside of the splice (indicating point L on Exhibit No. 26). In all of the splices it is the same. This is left off and he was bolting this on.

Prof. KERRY.—They bolt on to what member?

Mr. KINLOCH.—They bolt on to the cross member. They take off one of them in order to get in.

Prof. KERRY.—That is speaking of P-2 post?

Mr. KINLOCH.—Yes.

Prof. KERRY.—The cross brace that they call the buck brace?

Mr. KINLOCH.—Yes, I am not sure whether there was any place there—whether there was any turn bolt that he could put in, but there were different places where they could not drive the rivets where they would put in turn bolts, and they would fasten the tackle on the diagonal to lower the tools down. His brother was down below and he was letting his tools down to his brother. This box is about eight inches wide and eighteen inches long and five or six inches deep with a handle nailed across the top of it—a piece of board.

Prof. KERRY.—He said he was standing on his box?

Mr. KINLOCH.—He may have been standing on his box to reach the tackle over his head.

Prof. KERRY.—Where would he be standing?

(Mr. Kinloch pointed out the position evidently occupied by Mr. Lajeunesse.)

Prof. KERRY.—He was probably standing on the cross strut running from P-2-R to P-2-L and ending near the point marked L on Exhibit 26?

Mr. KINLOCH.—Yes, sir.

Prof. GALBRAITH.—On the cross strut between P-2-R and P-2-L?

Mr. KINLOCH.—Yes, sir.

Prof. GALBRAITH.—Close to P-2-R?

Mr. KINLOCH.—He must have just moved there because he was near there a few minutes before. They also cleaned up the bolts that were there and let them down. In fact they were finishing up.

Prof. KERRY.—He would probably up-end his box to reach the tackle?

Mr. KINLOCH.—No, sir, I do not know that he would; it would be too little a box to up-end and stand on.

Prof. KERRY.—Well, then, the jerk that threw him down would probably have only dropped him four or five inches?

Mr. KINLOCH.—I do not think he would have stayed there if he had got very much of a jerk.

Prof. KERRY.—His feet would drop in the box. He was probably standing on the edge of the box.

Mr. KINLOCH.—I do not know if you could get your feet in this box or not. I understood him to say that he dropped on his box.

Prof. KERRY.—He could see the lines of the big traveller from there?

Mr. KINLOCH.—I do not know if he could very distinctly—no. He could see that the traveller was there all right.

7-8 EDWARD VII., A. 1908

Prof. KERRY.—That is all that he said.

Mr. KINLOCH.—He could see probably the top part and he could probably see the little traveller better than the big traveller. There is a big mass of transverse bracing all through there.

Prof. KERRY.—He could see the Quebec truss of the anchor arm very fully?

Mr. KINLOCH.—Yes.

Prof. KERRY.—Then, referring to another point, what was the condition of the riveting on the main diagonals?

Mr. KINLOCH.—50s and 5?

Prof. KERRY.—Yes.

Mr. KINLOCH.—The two top splices down from the centre post were riveted complete, the next splice had no rivets (that is in the anchor arm)—none whatever and the joints were open about—well, from $\frac{1}{8}$ th to a quarter of an inch, just guessing. I never measured; I was not close, but the next splice down on the Quebec side was riveted complete. On the Montreal side the inside of the truss was riveted and the outside lacked about $\frac{1}{8}$ th of an inch of being close. That is all the splicing.

Prof. KERRY.—Is that loose splice you mentioned right down at the foot of the diagonal?

Prof. KINLOCH.—No, it is right at the top.

Prof. KERRY.—How about the connection with P-4?

Mr. KINLOCH.—That is a pin connection.

Prof. KERRY.—Right where the main diagonal connects with P-4 there was in that truss a horizontal brace running across the pier connecting with the cantilever arm.

Mr. KINLOCH.—Right at the end of it?

Prof. KERRY.—Yes?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—Was that riveted up?

Mr. KINLOCH.—No, sir, it was entirely loose.

Prof. KERRY.—It was in place but not fastened?

Mr. KINLOCH.—Not fastened.

Mr. HOLGATE.—At what point?

Mr. KINLOCH.—P-4.

Prof. KERRY.—Was it otherwise fastened?

Mr. KINLOCH.—Riveted at the other end.

Prof. KERRY.—Was it riveted to the T-5-Z members there?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—Was it riveted to the main post?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—So that it was practically finished except for one connection at the end of P-4 in the anchor arm?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—Why was it left loose?

Mr. KINLOCH.—According to instructions to provide for the movement of the centre post going ahead.

Prof. KERRY.—It had not yet settled in its final position?

Mr. KINLOCH.—No, sir.

Prof. KERRY.—Was it getting nearly into such a position that it could be riveted up finally?

Mr. KINLOCH.—No, the holes were too bad to do anything with it.

Prof. KERRY.—They would be how much out?

Mr. KINLOCH.—I never had it up in position enough to know for sure but I would say that it would be a hole out anyway.

Prof. KERRY.—The whole width of a hole?

Mr. KINLOCH.—Yes, sir.

SESSIONAL PAPER No. 154

Prof. KERRY.—Which way—too long or too short?

Mr. KINLOCH.—I think it was too long. I am not positive upon that because I did not pay much attention to it only I noticed it was out.

Prof. KERRY.—It was not considered of very great importance?

Mr. KINLOCH.—No, sir.

Prof. KERRY.—Was that on both the Quebec truss and the Montreal truss?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—The members were in the same condition?

Mr. KINLOCH.—The same condition.

Prof. KERRY.—Was the main diagonal of the cantilever arm riveted up?

Mr. KINLOCH.—It had no rivets in it in place?

Prof. KERRY.—Just bolted?

Mr. KINLOCH.—Just bolted.

Prof. KERRY.—Full bolted?

Mr. KINLOCH.—Yes.

Prof. KERRY.—Have you thought of anything you omitted to state in your evidence yesterday?

Mr. KINLOCH.—Mr. Holgat^d asked me about chord 10-L and I had noticed a bulging on the cover plate.

Prof. KERRY.—Of the anchor arm?

Mr. KINLOCH.—Yes, at the splice of chord 10 and 9, and I called the Indian's attention to it and told him to put a couple of bolts in it and asked him how long it had been in there and he said that it had been there ever since they came.

Prof. KERRY.—That is ever since the gang went there for the purpose of riveting up that joint?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—How long had they been working on the joint?

Mr. KINLOCH.—I think they started on Saturday; I am not sure. Also at the foot of 10, when it was set, it was found that the ribs did not match and we cut a diaphragm.

Prof. KERRY.—They did not match on the stub chord?

Mr. KINLOCH.—No; we cut a diaphragm, jacked the webs over, reamed the holes and held them over there with wedges.

Prof. KERRY.—Reamed which holes?

Mr. KINLOCH.—The holes in the diaphragm. The diaphragm was shop riveted in there and the ribs did not quite match. One of them was off from the other three.

Prof. KERRY.—A matter of how much?

Mr. KINLOCH.—About a quarter of an inch. When Mr. Scheidel came there we called his attention to it and it was his instructions to do that.

Prof. KERRY.—Then you field riveted it after you had reamed the holes out? You replaced the diaphragm with field rivets?

Mr. KINLOCH.—We replaced the diaphragm but whether it was field riveted or not I am not positive. I think it was left at the time; it was wedged there.

Prof. KERRY.—How were the wedges inserted?

Mr. KINLOCH.—A long thin wedge driven down between the end of the diaphragm and the chord rib.

Prof. GALBRAITH.—To widen the space?

Mr. KINLOCH.—To widen the space.

Prof. KERRY.—You spoke of Mr. Scheidel; we have not heard of him before as being on the bridge locally. How often did he visit the bridge?

Mr. KINLOCH.—Only once that I can remember. He may have been here twice, but he was here for quite a while at one time.

Prof. KERRY.—He did not come up in any specific connection, but was simply visiting the works?

7-8 EDWARD VII., A. 1908

Mr. KINLOCH.—I really do not know what he did come up for or whether he just came up on a visit.

Prof. KERRY.—While he was on that visit this particular detail was referred to him?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—If I remember rightly, Mr. Scheidel was responsible for all the detailing of the bridge?

Mr. KINLOCH.—I understood so; yes, sir.

Prof. KERRY.—Did you notice whether the Indians put the bolts in that you directed on that cover plate?

Mr. KINLOCH.—No, I do not believe I did.

Prof. KERRY.—You gave them that direction what day?

Mr. KINLOCH.—Wednesday, I think.

Prof. KERRY.—They were then working on the joint between 9 and 10?

Mr. KINLOCH.—Yes.

Prof. KERRY.—The bulge was on the upper end of 10? The plate had lifted?

Mr. KINLOCH.—Yes, the plate had lifted at the lower end of No. 9?

Prof. KERRY.—The lower end of No. 9 resting on No. 10?

Mr. KINLOCH.—Do you mean that the plate was solid on No. 10?

Prof. KERRY.—Yes.

Mr. KINLOCH.—I am not positive about that. It may have been up a little but not quite as much as it was at the upper end of No. 9.

Prof. KERRY.—How would you detect a defect of that kind?

Mr. KINLOCH.—By looking down through the hole.

Prof. KERRY.—The bolts were out?

Mr. KINLOCH.—What called my attention to it was that I cautioned them about taking the drift pins out, and told them why I wanted the drift pins left in, and I just looked through the hole and saw the plate was up. I told them to draw that plate down.

Prof. KERRY.—A matter of how much, do you suppose?

Mr. KINLOCH.—A quarter of an inch.

Prof. GALBRAITH.—Was that the condition all across the chord of the plate away from the angle iron all along the chord on the four ribs?

Mr. KINLOCH.—No, it was bolted on the edge and in the centre they only had drift pins in because it is about five feet to reach up and you cannot hold the bolt to put it in without special preparation and the instructions are to put drift pins in.

Prof. GALBRAITH.—What was the space between?

Mr. KINLOCH.—I suppose it was a gradual hump from one to the other; it was not a short bend or kink.

Prof. KERRY.—On the opposite edges it would probably be drawn down tight?

Mr. KINLOCH.—Yes, sir, it was drawn down tight.

Prof. GALBRAITH.—A gradual curve from one edge to the other showing the biggest space in the middle?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—On the opposite side the joint was full riveted on 9 and 10?

Mr. KINLOCH.—Yes, that gang had just moved over.

Prof. KERRY.—That is on the Quebec side?

Mr. KINLOCH.—Yes.

Prof. KERRY.—Do you think you have told us, Mr. Kinloch, every indication that you know of that could help us to find out the cause of the failure?

Mr. KINLOCH.—To the best of my memory, I have. There may be some small things in there, but I did not think they would have any bearing on the thing. There may be some little errors in there that I have not thought of.

Prof. KERRY.—Every reason you have got for forming personal opinions you have given to us?

SESSIONAL PAPER No. 154

Mr. KINLOCH.—Yes, sir. I might say that there was a slight error in punching in the anchor section of the main diagonals, but they would not have anything to do with it. That joint was completely riveted up, but there were some holes that were bad; in fact they were blind, and we had to put some re-enforcing plates on that. Mr. McLure has a sketch of the plate which will show that.

Prof. KERRY.—That is on the main diagonal?

Mr. KINLOCH.—Yes, sir, on the Montreal side.

Prof. KERRY.—In the evidence given by the witness, Alexander Beauvais, he mentioned that directly previous to the accident his working partner saw one rivet right on that 9 and 10 joint broken and very shortly afterwards another one broke. In ordinary practice is the failure in a comparatively short time after driving of field rivets a usual thing?

Mr. KINLOCH.—No, it is not a usual thing, but it happens sometimes.

Prof. KERRY.—It happens sufficiently frequently for you to assume that the fault is in the rivet generally?

Mr. KINLOCH.—Generally we do not pay any attention to it. You might hear some remark about it by the gang driving the rivets, but it would not alarm anybody.

Prof. KERRY.—You would lay the blame on the men driving the rivets rather than on the structure?

Mr. KINLOCH.—Yes, sir, you would think that it was in the rivets, not in the structure.

Prof. KERRY.—And if you saw two going close together you would still not be alarmed?

Mr. KINLOCH.—I do not know; no.

Prof. KERRY.—In addition he said that they saw the ribs bending away from the cover plate.

Mr. KINLOCH.—The side cover plate?

Prof. KERRY.—I imagine the cover plate of the rib he was working on. He was working on one of the two inside ribs. What would you have thought of that?

Mr. KINLOCH.—If I had seen it I would have been going yet.

Witness retired.

Mr. McLURE, recalled.

Prof. KERRY.—I think you might just go over the different points as Mr. Kinloch did. First of all, tell us about each of the unexpected happenings that came to your notice on the bridge and what was done in regard to them?

Mr. McLURE.—I could be able to do that better out of my books.

Prof. KERRY.—Are the books in the possession of the Commission just at present?

Mr. McLURE.—No, sir, they are right here.

Prof. KERRY.—Take your books, please? (Witness produced a note-book.)

Mr. HOLGATE.—Is that a private note-book?

Mr. McLURE.—No, sir.

Mr. HOLGATE.—Has it got the information?

Mr. McLURE.—It has got a record of the things I found on the bridge. I think very nearly everything is in there. There may be a few things I have in my diary that I have here and there may be a few things that are not in here that will be in my correspondence with Mr. Cooper. I cannot attempt to recall all those things to mind now. The book is entitled, 'Record of shop errors found in field during erection.'

(Note-book put in and marked Exhibit No. 38).

Prof. KERRY.—By reference to the book you can go over your ground thoroughly?

Mr. McLURE.—I think so.

Prof. KERRY.—I think it would be well to have your own statement.

Mr. McLURE.—Do you want me to cover the ground that Mr. Kinloch covered too, because everything he stated to you I have seen myself.

7-8 EDWARD VII., A. 1908

Prof. KERRY.—Very largely, Mr. McLure, because in a good many cases Mr. Kinloch left his evidence incomplete for reference to you for the facts?

Mr. McLURE.—I have not got the dates down here (referring to Exhibit No. 88). The first thing I can remember that we came across in the erection that had to be rectified was in the batten plates on the dummy chords A-O-O—R and L at the connection to the top of the post P-1-R-L. These batten plates interfered with entering the chords and we had to cut them off. We referred the matter to Mr. Cooper and the Phoenixville office and we were instructed to leave them off.

Mr. HOLGATE.—It is a pity you cannot give the date of that.

Mr. McLURE.—I will tell you when it was—September, 1905.

Mr. HOLGATE.—Can you say that the exhibit is a record of all the shop defects found in the field?

Mr. McLURE.—Yes, shop defects and every other kind of defects.

Mr. HOLGATE.—All?

Mr. McLURE.—All except, as I said before, perhaps one or two that I have in my correspondence or diary that would not be in here, but I cannot think of any now that I have not included in here.

Prof. KERRY.—I think you were just taking up, Mr. McLure, a case that you considered it necessary to refer to a higher authority for advice?

Mr. McLURE.—This is on April 21, 1906. At the connection of diagonal A-T-4, with top chord of truss floor beam A-F-B-8 of the anchor arm 7 holes on each side of the diagonal A-T-4 did not match the holes in the floor beam. This was referred to Mr. Cooper and Phoenixville, it was thought that it should be reinforced and a plate was furnished to put on over the connection plate and holes drilled through from the strut to the plate.

Prof. KERRY.—A reinforcing plate was supplied, drilled in place and riveted?

Mr. McLURE.—No, sir, it was never put on. Mr. Cooper said that it was not necessary. But it was provided by the Phoenix Bridge Company.

Prof. KERRY.—Provided but not put on?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—Were the holes, where necessary, left unfilled?

Mr. McLURE.—No, sir; the holes were drilled through the original connection, the plate without the re-enforcing plate, and riveted that way. In the connection between S-V-5-L on top of hanger A-U-T-5-Z-L of anchor arm, two horizontal rows of holes on the inside did not match by an inch and a quarter. These were the holes that connected the big truss anchor and the top splice plate on the hanger. A sketch was sent in to Phoenixville by Mr. Birks, and a re-enforcement plate provided for that connection and riveted on there only recently. I have not the date for that.

Prof. KERRY.—Will these sketches be among the file of plans?

Mr. McLURE.—I have a sketch of it here.

Prof. KERRY.—Put in by Mr. Hoare?

Mr. McLURE.—Put in by Mr. Hoare.

Prof. KERRY.—Mr. Hoare has supplied us with the Quebec bridge plans.

Mr. McLURE.—No, I do not believe it will be. Then, as Mr. Kinloch has already said, there was a slight dish found on the top centre post section C-P-1-R and L after the brackets were riveted on. That was referred to Mr. Cooper and his suggestions followed in the matter when it was erected.

Prof. KERRY.—What were the suggestions?

Mr. McLURE.—To get a certain percentage of bearing area before we allowed it to be erected. That is in the correspondence.

Prof. KERRY.—His instructions were carried out?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—Did you note that joint at any subsequent time?

Mr. McLURE.—Yes, sir, I think I did. I remember looking at it—I do not remember just what date, but this year some time. Of course, it was a joint between two

SESSIONAL PAPER No. 154

flat plates, and it was spliced up with these splices on the sides, so that practically all you could see were the corners.

Mr. KERRY.—The spliced plates that you remember seeing in the two finished surfaces were in good contact?

Mr. McLURE.—Yes, sir. At the time of the erection of that joint Mr. Birks and I took some thin steel feelers and went down in the sections, in the manholes in the two plates that come together, and slipped this in and around the edges to see how the bearing was actually. I have a record of that. The top cover plates over centre posts C-P-R & L that connect the top laterals on the cantilever arm side did not fit the connecting angles in the post sections. On the west truss it was not a sufficiently bad fit to make any change in the metal, so that the holes were reamed. On the east truss in the connecting angles they were sent from Phoenixville in the blank, taken up there and drilled to fit. Mr. Kinloch has already mentioned a warp in the base plate of the east shoe that was found at the time of setting the shoe in August, 1905. It ran through in a longitudinal direction in the east half of the shoe, the maximum being $\frac{1}{8}$ ths of an inch. This was reported, and the instructions were to watch it and see if the weight placed on the shoe would take that warp out. Subsequent inspection showed that the weight had taken the warp out, but not altogether.

Prof. KERRY.—Were any repairs made?

Mr. McLURE.—No, sir.

Prof. KERRY.—That was the joint between—

Mr. McLURE.—Between the top pedestal and the shoe.

Prof. GALBRAITH.—That was a warp that was in it when it arrived and was delivered at the bridge?

Mr. McLURE.—We did not notice it until we set it and compared it with the top plate of the pedestal.

Prof. KERRY.—It remained to the end as a minor but permanent defect?

Mr. McLURE.—I could not say about the end; the last time I saw it it was not entirely up. We had instructions to plug it up with red lead or paint filler to prevent moisture getting in, and you could see in the squeezing out that it was settling and that it had not altogether closed.

Prof. GALBRAITH.—What was the thickness of the plate?

Mr. McLURE.—I think it was a 3-inch plate planed down to 2½ inches. In the transverse strut belonging to truss 4-B-F-B-9 of the cantilever arm—the bottom transverse strut—the end of the connection plates had to be chipped slightly in order to enter them in the connection at the feet of posts P-4.

Prof. KERRY.—What date?

Mr. McLURE.—I have not the date for that, but it must have been in August, 1906. They were chipped off and four rivet holes removed from one of the plates at the chord I refer to. The thickness was two plates, and reports were sent in in the regular way about it.

Prof. KERRY.—What would be the amount chipped off?

Mr. McLURE.—About 16 square inches.

Prof. KERRY.—In length, I mean?

Mr. McLURE.—I have a sketch of it.

Prof. KERRY.—I understand that the transverse strut was too long? (The witness here explained the detail of this alteration from his notes in Exhibit No. 38) and continued: On the end post of the cantilever arm at the connection to the north ends of the end bottom chords we found on the south side of the posts the plate lapping over the chord extended too far down and this was evidently a mistake in reading the drawing. The chord was chipped in the field to fit the post and a note sent of it to the shop and the posts for the north side were remodelled accordingly. In the tops of the end posts on the cantilever arm the outstanding legs of four vertical stiffener angles had to be chipped about an inch and a half to admit the connecting link for

7-8 EDWARD VII., A. 1908

the suspended span. I guess that is all. I did not read over all but those are all the ones that were rectified as I remember.

Prof. KERRY.—In general, Mr. McLure, would you say that in all details the shop work was exceedingly satisfactory?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—The errors that you found either in the dimensions of members or in the provisions for riveting were very few?

Mr. McLURE.—Very few indeed.

Prof. KERRY.—And for the field riveting the holes were found to match well?

Mr. McLURE.—I cannot speak with as much authority on that as Mr. Kinloch, but considering the number of holes, I should say that they matched very well.

Prof. KERRY.—Mr. Kinloch mentioned two or three places where there were cracks in members. You might speak about them?

Mr. McLURE.—There was one crack in a finished plate for the bottom strut of truss floor beam F-13-8 at the foot of Post P-4 on the south anchor arm. It was noticed that the plate was cracked shortly after its erection and a report was made of it and a repair plate furnished and put in place. I do not recollect any other cracks except one or two lattice angles had the outstanding leg cracked on some of the transverse braces.

Prof. KERRY.—No members were erected that were known to be cracked at the time, Mr. McLure?

Mr. McLURE.—No, sir. Yes, there was one transverse diagonal that had the outstanding leg of the lattice angle cracked; that was erected, a note made of it and the understanding was it was to be cut off and a new angle put on.

Prof. KERRY.—Was that done?

Mr. McLURE.—No, sir, it has never been done yet; it is out on the end of the cantilever arm.

Prof. KERRY.—Where would the record of that be?

Mr. McLURE.—In another book there. (Book produced, filed, and marked Exhibit 39). Shall I read it, about that lattice angle?

Mr. HOLGATE.—Yes, or note what page it is.

Mr. McLURE.—It is page 5 of Exhibit 39. 'Transverse diagonal 671-T. 71 south cantilever arm. Third lattice angle from the top bend on this diagonal has its outstanding leg cracked, and must be replaced.'

Prof. KERRY.—We had some evidence dealing with the crinkling up of the joint of a bend in the plates between the centre post and S-P-5.

Mr. McLURE. S-P-5, yes, sir. I had correspondence with Mr. Cooper about that.

Prof. KERRY.—Your correspondence with Mr. Cooper and Mr. Kinloch's evidence cover that point perfectly.

Mr. McLURE.—Yes, sir.

Prof. KERRY.—Then you have now covered all the actual difficulties that you noted, either by exhibits or your statements.

Mr. McLURE.—Yes, as near as I can recollect now.

Prof. KERRY.—And there has been certain evidence given with regard to cracked plates in the vicinity of the base of the centre post? Different witnesses have mentioned different plates as cracked. Can you give any evidence bearing on those?

Mr. McLURE.—I never saw any cracked plates there.

Prof. KERRY.—How thoroughly and how often would you have inspected that part of the bridge?

Mr. McLURE.—I cannot say exactly as to how often, but when I inspected it I inspected it thoroughly enough to see a crack of any magnitude at all.

Prof. KERRY.—Will you say positively that all the plates around the base of the centre post had been inspected since June 15 by you?

Mr. McLURE.—Yes, sir.

SESSIONAL PAPER No. 154

Prof. KERRY.—And that to your observation there was no crack in any one of them?

Mr. McLURE.—No, sir, not the slightest.

Mr. DAVIDSON.—Might I suggest to the commissioners that the witness be asked if he could account in any way for the very positive statement made by three witnesses that they saw cracked plates?

Mr. HOLGATE.—Which witnesses?

Mr. DAVIDSON.—Ouimet—

Mr. HOLGATE.—Ouimet has not come before us.

Mr. DAVIDSON.—No, of course his statement was at the coroner's inquest, but the other two, Davis and Lafrance, they were cross-examined on the point, they were asked if it was possible they could be mistaken, if they could have mistaken something else for a crack and notwithstanding that they still maintained that it was cracks that they saw. I would like to know if Mr. McLure can account for that in any way.

Prof. KERRY.—What explanation would you offer of any appearances that could have misled these witnesses?

Mr. McLURE.—The only explanation I could offer would be that they might have seen a crimp in the plate from Lafrance evidence; of course I cannot locate even the plate he saw it on. From Mr. Davis' evidence the crimp and the crack that he said he saw are in exactly the same place.

Prof. KERRY.—Could you make a sketch as a matter of evidence showing a section through the plate right at the crimp to show how sharply the plate was bent there?

Mr. McLURE.—I do not know from memory if I can. I can try it.

Prof. KERRY.—Just a transverse section through the plate.

Mr. McLURE.—Yes, sir.

Mr. STUART.—I am told that Mr. Edwards has an actual sketch of that crimp which was referred to Mr. Cooper; he can produce it.

Mr. HOLGATE.—Perhaps it would facilitate Mr. McLure's explanation if something like that were here.

The witness made a sketch which was filed and marked as Exhibit 40.

Prof. KERRY.—Would it be possible, Mr. McLure, that a crack in the paint would look like a crack in the plate itself?

Mr. McLURE.—It might look like a hair crack, but not like a crack $\frac{1}{4}$ of an inch wide.

Prof. KERRY.—The evidence of the witness Davis was directed towards a narrow crack, not $\frac{1}{4}$ of an inch wide.

Mr. McLURE.—Yes.

Prof. KERRY.—Have you ever been misled personally by any such surface cracks?

Mr. McLURE.—No, sir, not that I recollect; I always carry something around to scrape the paint off.

Prof. KERRY.—Have you been misled to the extent of requiring to scrape the paint off to make sure?

Mr. McLURE.—I do not remember any particular instance.

Prof. KERRY.—Passing from errors and cracks, Mr. McLure, what can you tell us about the deformations of the members that have been observed?

Mr. McLURE.—In all the compression members, especially those with heavy webs, we have noticed more or less deformation in the webs.

Prof. KERRY.—That is in advance of erection?

Mr. McLURE.—In advance of erection, yes, sir.

Prof. KERRY.—The deformation would amount to how much?

Mr. McLURE.—I do not think in any case over three quarters of an inch and not

7-8 EDWARD VII., A. 1908

usually as much as half an inch. I do not remember the figures, we measured a few and sighted along a greater number.

Prof. KERRY.—You would not be able to observe whether that deformation ran completely across the ribs or not, your observation would be mainly confined to the upper surface, would it not?

Mr. McLURE.—The only way you could observe that would be by measuring the ribs with a line, top and bottom.

Prof. KERRY.—Was that done in any cases?

Mr. McLURE.—I do not remember except in the cases of the chords in place that we measured recently.

Prof. KERRY.—Then to the best of your knowledge no members went into the bridge with deformation in excess of the neighbourhood of half an inch?

Mr. McLURE.—No, sir.

Prof. KERRY.—And you inspected all the members before they were placed in the bridge for that among other defects, did you?

Mr. McLURE.—I did all members with the exception of the first nine bottom chords of the south anchor arm, which were placed before I arrived on the work.

Prof. KERRY.—The first nine. Which would the first nine be specifically?

Mr. McLURE.—From one to nine inclusive.

Prof. KERRY.—On one side?

Mr. McLURE.—Both sides.

Prof. GALBRAITH.—When you say the deformation was not more than one half inch, how is the deformation measured; what base line do you measure from; between what points are you taking the measurement?

Mr. McLURE.—Usually the total length of the latticing, I think.

Prof. GALBRAITH.—A straight line from one end to the other?

Mr. McLURE.—I do not remember exactly how we did measure them all.

Prof. GALBRAITH.—You are estimating by eye from a straight line?

Mr. McLURE.—No, actual measurement with a rule.

Prof. GALBRAITH.—Did you stretch a line from one end to the other?

Mr. McLURE.—From one end to the other as far as we could get in some. I do not remember whether in every case we went from one end to the other with the line, because it would not be possible to do it on account of the connections at the end, but I think we covered the latticing in every case to a batten plate.

Prof. GALBRAITH.—You went from one batten plate to the other with the line?

Mr. McLURE.—There is not always a batten plate at each end of a compression member; that is, a splice plate acts as a batten plate when fully riveted on, and in the condition in which we made these measurements a splice plate would not be on.

Prof. GALBRAITH.—The line would be roughly in the neighbourhood of 50 feet?

Mr. McLURE.—I cannot give you any general rule.

Prof. GALBRAITH.—What I want to get at is whether you are speaking of local deformations measured from a short base line, say from 5 to 10 feet or whether you are speaking of a general deformation of the whole web taken from a base line as nearly as possible from end to end.

Mr. McLURE.—That is what I was referring to.

Prof. GALBRAITH.—And you say that it was in the latter way that the measurement was taken?

Mr. McLURE.—Yes, sir.

Prof. GALBRAITH.—And the deformations, as far as you know, did not exceed one-half inch?

Mr. McLURE.—Yes, sir, to the best of my recollection.

Prof. KERRY.—Now, you might tell us all that you know about the subsequent deformations?

Mr. McLURE.—I watched the main post for subsequent deformations and never found any. The post P—4 anchor and cantilever arm, at the time of the collapse of the

SESSIONAL PAPER No. 154

bridge, had already received their maximum compression stresses as well as post P-3. I had watched all these posts for deflections and never could detect any. Also some of the sub-diagonals connected to these posts. The intermediate verticals between these posts I had watched for signs of buckling but never detected any. In the centre post particularly I had watched together with Mr. Kiuloch to detect when the different sections would be exactly in line across the splices and we had observed that centre post numerous times at a not very remote date and from our observations it was perfectly in line.

Prof. KERRY.—The joints of the post were bearing full ?

Mr. McLURE.—Yes, sir, every one of them.

Prof. KERRY.—And the post itself, as far as you could observe, was perfectly true ?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—It was swinging on the main pin ?

Mr. McLURE.—It had freedom to turn on the main pin.

Prof. KERRY.—At no very remote date, you say; you mean any time last month ?

Mr. McLURE.—Yes, sir, not any longer ago than that.

Prof. KERRY.—A month previous to the accident ?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—Then with regard to the chord sections ?

Mr. McLURE.—I think the first thing my attention was called to in regard to bending in the chord section was the splice between chord 7 and 8-L on the cantilever arm, which had one of the inner ribs bent in towards the other one between the diaphragms, a maximum of three-quarters of an inch right at the splice. That did not extend entirely to the top of this rib although it did slightly, that is it was not three-quarters of an inch at the top but it was I forget how much, something less.

Prof. KERRY.—The lining at the top of the two ribs, 7 and 8, was not perfect ?

Mr. McLURE.—Not perfect but less out of line than the beam. It was measured very carefully by Mr. Birks and myself and reported with a recommendation to insert a diaphragm between the inner ribs extending upward six rivets, I think.

Prof. KERRY.—That is a diaphragm connecting the two inner ribs ?

Mr. McLURE.—Yes, sir, and I think Mr. Cooper did not approve of that method.

Prof. KERRY.—In any case the recommendation was not carried out ?

Mr. McLURE.—No, sir, not yet. I believe it was being discussed at the time of the accident between Mr. Cooper and the Phoenix Bridge Company.

Prof. GALBRAITH.—By the top do you mean the north end of the chord ?

Mr. McLURE.—No, the top and bottom of the rib.

Prof. GALBRAITH.—Four or five feet between ?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—Was that the only case of failure to line that had come to your attention, Mr. McLure ?

Mr. McLURE.—No, there was something similar at the splice between chord 3 and 9 L on the cantilever arm. It was only $\frac{1}{8}$ of an inch out of line. The same rib at the bottom of the rib, the top of the rib was perfectly safe. That was not reported because it was not considered of sufficient importance and any reinforcement that might be recommended for the chord that was out of line three-quarters of an inch would apply to the other.

Prof. KERRY.—Were these deflections corrected before the joint plates were riveted on ?

Mr. McLURE.—They never were corrected.

Prof. KERRY.—These joints have not been riveted ?

Mr. McLURE.—No, sir, not completed.

Prof. KERRY.—Is it a customary thing to find when the riveting was about to commence, that there were little errors in lining between the ribs ?

Mr. McLURE.—Errors of lining but not errors of alignment except the two instances I have mentioned. Errors of lining I should take to mean that one rib did not match the other at the end exactly.

Prof. KERRY.—That is what I mean ?

Mr. McLURE.—Yes, sir, I found several of those errors on the anchor and cantilever arm both and they always occurred on one of the two inner ribs at the bottom. One splice in the cantilever arm, I forget which one it was, the error did not amount to more than one-quarter of an inch. It was referred to Mr. Cooper in my correspondence and he replied to do the best we could with it. I described our method of jacking the rib back, but he said to make the best job we could with it.

Prof. KERRY.—Would the wind in the rib extend far back or would it start at the diaphragm plate and be just a little local twist ?

Mr. McLURE.—Well, it is so small you could not detect it with your eye. It was just by having the two not matched that you could tell there was any at all.

Prof. KERRY.—It was never permitted to start to rivet up any of these chord joints until the two adjoining sections were in contact from the top joint to the bottom ?

Mr. McLURE.—Yes.

Prof. KERRY.—That was the practice followed ?

Mr. McLURE.—Yes, that was the practice; there never was any riveting done until an attempt was made at least to get them into perfect contact. Of course there were slight variations; it was not possible to jack a thing back all the way, I think.

Prof. KERRY.—You are misunderstanding me for the minute. I understand that as far as the lining of the ribs of two adjacent sections is concerned, that they were jacked into line as closely as possible ?

Mr. McLURE.—Jacked into line as closely as possible.

Prof. KERRY.—And then side plates were put on, and then they were riveted in that position ?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—And the deviation at the time you left them would probably not be as great as one-sixteenth of an inch ?

Mr. McLURE.—No, sir.

Prof. KERRY.—Considering the ends of two adjacent chord sections, they would have been put in in most of the cases you have mentioned with the upper ends in contact and with the camber taken care of by an opening in the bottom ?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—Before the riveting was commenced, and at the time of this jacking and interlining, would those joints be closed up perfectly ?

Mr. McLURE.—No riveting was ever started on any joints in a chord before they had a full bearing.

Prof. KERRY.—They were carefully inspected for that ?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—Would you show us, by sketch, what the method of jacking was ?

Mr. McLURE.—I do not think I could. It was customary to support the jack against the other inner rib and to transfer part of the pressure to the next outer rib by means of a wooden shore.

Prof. KERRY.—Was any precaution taken, Mr. McLure, to get the four ribs in their correct relative positions to one another when finally jacked into position ? If I remember rightly, in each case the four ribs were held by diaphragm plates within four feet of the joint ?

Mr. McLURE.—Yes.

Prof. KERRY.—So that any alteration in the correct theoretical spacing of ribs was either a shop error or it would be a bend that would occur in the last four feet of the rib ?

Mr. McLURE.—No, because these diaphragms do not extend the full length of the rib, they only extend about half way down or a little over, I think.

Prof. KERRY.—Was it possible for one of these ribs to warp below the diaphragm ?

Mr. McLURE.—I should think so; this bend that caused the imperfect bearing might extend back of the diaphragm to the bottom, and, as I said before, all the imperfect matchings that were noticed were at the bottom.

SESSIONAL PAPER No. 154

Prof. KERRY.—That wind might start further back than the diaphragm?

Mr. McLURE.—Yes, I should think so.

Prof. KERRY.—And would the spacings between the ribs be correct when you finished jacking, or how much would they be in error?

Mr. McLURE.—I do not think they ever measured it.

Prof. KERRY.—You never measured it?

Mr. McLURE.—No, sir.

Prof. KERRY.—How would you determine when it became a question of jacking one rib out and the other in? How would you determine which to work on, or would you jack both?

Mr. McLURE.—We would jack the rib which seemed to be out of line, but that would be a matter of judgment.

Prof. GALBRAITH.—Was the riveting of the diaphragm you speak of done in the shop?

Mr. McLURE.—Yes, sir.

Prof. GALBRAITH.—Or done in the field, or done sometimes in one place and sometimes in the other.

Mr. McLURE.—The diaphragms Mr. Kerry referred to as being back of the splice about four feet were riveted in the shop entirely, I think.

Prof. GALBRAITH.—Going back to that 7-8 joint in the cantilever arm, that $\frac{1}{2}$ of an inch deviation, was that entirely in one rib?

Mr. McLURE.—Yes, sir, entirely.

Prof. GALBRAITH.—The other three ribs lined correctly?

Mr. McLURE.—The other three lined correctly.

Prof. GALBRAITH.—Were there any instances to your knowledge, Mr. McLure, in which the side plates had to be bent to bear up correctly against the two chord members?

Mr. McLURE.—No, sir, not to any extent.

Prof. GALBRAITH.—So far as you know in each case the side plate that was set on the outside was a plane surface?

Mr. McLURE.—Yes, sir.

Prof. GALBRAITH.—So that beyond this deviation of the inner ribs you have mentioned you were not aware of any defect in the lining of the adjacent chords?

Mr. McLURE.—Not at the splice. I said I did not know of any splice plate that had to be bent. I wish to qualify that by saying that at the splice between 7 and 8-L the splice plate on the rib that was bent was riveted on and that splice plate----

Prof. GALBRAITH.—That is on an inner rib?

Mr. McLURE.—An inner rib.

Prof. GALBRAITH.—As far as you know the spliced ribs on the outer rib at the same point were true?

Mr. McLURE.—Yes, sir.

Prof. GALBRAITH.—What defect did you notice in the chord members, not at the splices but between the splices, along the length of a member?

Mr. McLURE.—My attention was called by Mr. Kinloch to the bends in chord A-9-L in the anchor arm, and 8 and 9-R in the cantilever arm.

Prof. GALBRAITH.—At the same time or different times?

Mr. McLURE.—At the same time.

Prof. GALBRAITH.—But you have heard of those defects of those three chords at the same time?

Mr. McLURE.—I believe he mentioned something about the cantilever arm two or three days before he called my attention to the anchor arm, but I do not remember just what he said, I just have a faint recollection of him saying something.

Prof. GALBRAITH.—You did not make any inspection of those?

Mr. McLURE.—Not at that time.

7-8 EDWARD VII., A. 1908

Prof. GALBRAITH.—And the first inspection you made personally was when Mr. Kinloch called your attention to the A-9-L chord on the anchor arm ?

Mr. McLURE.—Yes, sir.

Prof. GALBRAITH. Did you say he called your attention to A-9-R ?

Mr. McLURE.—No.

Prof. KERRY.—I think somebody mentioned yesterday without going into the evidence, Mr. McLure, that you were sick shortly previous to the failure of the bridge ?

Mr. McLURE.—Yes.

Prof. KERRY.—Between what dates would you have been absent from the bridge ?

Mr. McLURE.—Between Saturday afternoon, August 17, and Friday morning,

August 23.

Prof. KERRY.—Then probably just on your return Mr. Kinloch mentioned something about it ?

Mr. McLURE.—I think it was the afternoon of my return.

Prof. KERRY.—The chords on the cantilever arm ?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—When did he draw your attention to the A-9-L on the anchor arm ?

Mr. McLURE.—On Tuesday morning, August 27.

Prof. KERRY.—About the middle of the morning ?

Mr. McLURE.—About 9.30.

Prof. KERRY.—What action was taken ?

Mr. McLURE.—We went immediately with Mr. Birks to the chords, first to A-9-L, and took measurements, with a line stretched from the edge of the batten plate to batten plate.

Prof. KERRY.—You measured the off-sets ?

Mr. McLURE.—Measured the off-sets along the line at every panel point of the lattice ends.

Prof. GALBRAITH.—What sort of line ?

Mr. McLURE.—A bit of string, fish line, I think it was.

Prof. GALBRAITH.—Have you a record of these measurements with you ?

Mr. McLURE.—Yes, sir.

Document produced, filed and marked Exhibit No. 41.

Prof. KERRY.—This exhibit No. 41, shows the measurements taken at that time ?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—As soon as you took those measurements, Mr. McLure, what followed ?

Mr. McLURE.—Pretty shortly after that we went to lunch.

Prof. KERRY.—That is to say you measured the one chord 9-L and then went to lunch ?

Mr. McLURE.—Measured the three of them. It took pretty nearly till lunch, and then 9-R cantilever and then 9-L in the cantilever arm.

Prof. KERRY.—You went immediately over and measured those as well ?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—Then what followed ?

Mr. McLURE.—Well, at lunch we talked it over at the bridge.

Prof. KERRY.—We, would mean whom, in that case ?

Mr. McLURE.—Mr. Birks, Mr. Yenser, and, part of the time, Mr. Kinloch, I think, and myself; and we decided to report immediately with sketches.

Prof. KERRY.—To whom ?

Mr. McLURE.—To Mr. Cooper and to the Phoenix Bridge Company.

Prof. KERRY.—Did you discuss at that time as to whether any more work should be done or not ?

Mr. McLURE.—Yes.

Prof. KERRY.—Pending those reports ?

Mr. McLURE.—Yes.

SESSIONAL PAPER No. 154

Prof. KERRY.—And your conclusion was?

Mr. McLURE.—There was not any definite conclusion reached at that time. I think Mr. Yeneer said it was his intention not to add any more work to the bridge until we found out what was causing the condition of the chords.

Prof. KERRY.—Was your own opinion of the advisability of adding any more weight, expressed?

Mr. McLURE.—Yes.

Prof. KERRY.—And to what effect?

Mr. McLURE.—I said at the time I thought it would be poor policy to either move the traveller or add more weight, because if anything had to be done to rectify those chords, it could be easier done at that time than after the stress had been increased.

Prof. KERRY.—You were convinced that those deflections had occurred after the members were placed in the bridge?

Mr. McLURE.—I was convinced of that in the case of chord 9-L of the anchor arm. Of the chords in the cantilever arm I was not sure.

Prof. KERRY.—You did not consider that there was any possibility of the A-9-L chord in the anchor arm recovering itself?

Mr. McLURE.—You mean getting back into line again?

Prof. KERRY.—Yes.

Mr. McLURE.—No, sir; I did not see it could. I do not know that I ever thought of it doing that at all.

Prof. KERRY.—You would not, as an engineer, consider that a column that was once forced out of line by direct thrust along its axis, could possibly recover itself while that thrust remained on the column?

Mr. McLURE.—No, not without the application of some exterior force.

Prof. KERRY.—That is to say it was recognized at the time that some action had to be taken to straighten up that member?

Mr. McLURE.—I thought so, yes.

Prof. KERRY.—And your decision was to report immediately to Mr. Cooper the condition of affairs?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—And you had also the statement of Mr. Yeneer that he did not propose to place any more load on the member until he was further advised by the proper authority?

Mr. McLURE.—Yes, I was so convinced that that was his determination that I mentioned that in my letter to Mr. Cooper.

Prof. KERRY.—What further action did you take then?

Mr. McLURE.—I took the rest of the day to get that report off.

Prof. KERRY.—You wrote a report to Mr. Cooper, which went off that evening?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—Fully describing the situation?

Mr. McLURE.—With sketches.

Prof. KERRY.—And then what further action?

Mr. McLURE.—I called up Mr. Hoare on the telephone, and told him I would like to see him that afternoon, and went in to see him in Quebec. I explained the situation to him and we talked it over. I suggested going to Phoenixville and New York, and he seemed to think it would be a good plan. He told me first to go out in the morning and examine all connections in the bridge that could possibly have any relation to those members, and see if I could find any further cause of trouble, also to run the levels of the main pier.

Prof. KERRY.—These instructions were carried out?

Mr. McLURE.—Yes, sir, by Mr. Kinloch and myself.

Prof. KERRY.—And you found no alterations in the levels of the main pier?

Mr. McLURE.—Not the slightest.

Prof. KERRY.—And you found no further indications of trouble?

Mr. McLURE.—No further indications of trouble whatever, in any other members than the ones mentioned.

Prof. KERRY.—You noted immediately in the morning that Mr. Yenser had changed his decision?

Mr. McLURE.—Almost immediately.

Prof. KERRY.—Did you take any action with regard to that?

Mr. McLURE.—No, sir, I told him I thought it was poor policy, that was all.

Prof. KERRY.—You told Mr. Yenser—

Mr. McLURE.—Yes, sir.

Prof. KERRY.—That you thought it was bad judgment on his part to do so?

Mr. McLURE.—I do not think I said bad judgment; I think I said poor policy.

Mr. Birks and I had already figured that moving the traveller would increase the stress on that chord a very slight amount. I think I got 40 pounds a square foot and he got 50 pounds a square foot as the increased stress; that is about one-half of one per cent of the stress it was receiving at that time.

Prof. KERRY.—You were both trained engineers, Mr. McLure, and did it occur to you in connection with that investigation that a column that had been bent out of line under stress along its axis is likely to go on and continue to bend out of line under the same stress?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—At a more rapid rate?

Mr. McLURE.—I do not know that the rate entered into my thoughts, but I fully understood that a column out of line is more apt to bend than it would have been if it had been straight, under the same stress.

Prof. KERRY.—You were perfectly clear in your own mind that the safe unit stress on a column bent out of line is considerably less than the safe unit stress on a column that is perfectly true?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—And what ground did you take with regard to the small increase of stress which the movement of the traveller would produce in the member?

Mr. McLURE.—In my own mind I did not consider it would do any particular harm to move the traveller.

Prof. KERRY.—You did not think that the increase in the stress itself—

Mr. McLURE.—Would be sufficient to cause any trouble with that chord. To prove that I walked out behind the traveller while they moved it.

Prof. KERRY.—We are to understand there was just the one definite measurement made for that chord?

Mr. McLURE.—That is all to my knowledge.

Prof. KERRY.—You were on the bridge when the traveller was moved out?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—And you examined the chord after it was moved out?

Mr. McLURE.—Yes, sir, without measuring it.

Prof. KERRY.—Without noticing any alterations?

Mr. McLURE.—Not much.

Prof. KERRY.—Without measurement?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—And you left the bridge when?

Mr. McLURE.—I left at 12.30 on Wednesday.

Prof. KERRY.—Was the traveller then fully out?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—Your letter would have reached New York about when?

Mr. McLURE.—Reached there the same time I did.

Prof. KERRY.—You wrote it on Tuesday?

Mr. McLURE.—It was mailed Tuesday evening, and I do not know what time it

SESSIONAL PAPER No. 154

reached the city, but Mr. Cooper would have received it and read it when he came to the office on Thursday morning, which he did.

Prof. KERRY.—Was Mr. Yenser's action in moving out the traveller reported to Mr. Hoare or Mr. Cooper?

Mr. McLURE.—Well, not in that letter, because that was before he moved the traveller.

Prof. KERRY.—I mean you did not wire to Mr. Cooper that that action had been taken previous to your leaving Quebec?

Mr. McLURE.—No, sir.

Prof. KERRY.—Did you telephone to Mr. Hoare about it?

Mr. McLURE.—Mr. Hoare was on his way out to the bridge.

Prof. KERRY.—Mr. Hoare was on his way to the bridge, so that he saw when he came out—at what time did he arrive?

Mr. McLURE.—About eleven o'clock, I think, on Wednesday.

Prof. KERRY.—You drew his attention, when he came out, to the fact that the traveller had been removed?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—Did you discuss at that time whether it was necessary to take any action of that sort in regard to the safety of the bridge?

Mr. McLURE.—Nobody had any idea that the safety of the bridge was in danger.

Prof. KERRY.—So that the matter was not discussed?

Mr. McLURE.—Not discussed in that light.

Prof. KERRY.—You are clear on that, Mr. McLure? You mean that it never occurred to any one that the safety of the bridge was threatened?

Mr. McLURE.—No, sir.

Prof. KERRY.—And that any drastic action to protect the bridge was therefore not thought about?

Mr. McLURE.—That is the idea.

Prof. KERRY.—You went over the bridge with Mr. Hoare?

Mr. McLURE.—No, I did not. I left too soon for New York and Phoenixville.

Prof. KERRY.—You left to go down to New York and you did not accompany Mr. Hoare on his examination of the bridge?

Mr. McLURE.—No, sir.

Prof. KERRY.—And between Tuesday morning and the time you left no accurate measurements were made to see whether that deflection was increasing?

Mr. McLURE.—No, sir, no actual measurements.

Prof. KERRY.—Then what followed, in your own personal experience, Mr. McLure, after you left the bridge?

Mr. McLURE.—I got to New York next morning at 7.30.

Prof. KERRY.—That would be Thursday morning?

Mr. McLURE.—Thursday morning—went down to Mr. Cooper's office and saw Mr. Berger. Mr. Cooper did not get in till 11.15, and so I had to wait and see him. As soon as he came in he found my letter waiting for him, and he read it and I went in to see him. I also had my notes and sketches with me and explained the matter to him.

Prof. KERRY.—Are these notes and sketches in evidence?

Mr. McLURE.—This sketch you have (sketch marked exhibit No. 41) I showed to Mr. Cooper.

Prof. KERRY.—And?

Mr. McLURE.—We talked the matter over; I explained to him any points he was not clear on and he told me to go to Phoenixville.

Prof. KERRY.—It was a thorough discussion, Mr. McLure?

Mr. McLURE.—I do not remember just what was said.

Prof. KERRY.—How long were you talking over the matter?

Mr. McLURE. Not more than 45 minutes.

7-8 EDWARD VII., A. 1908

Prof. KERRY.—You drew Mr. Cooper's attention then to the fact that the traveller had been moved forward since?

Mr. McLURE.—Yes.

Prof. KERRY.—And to the fact that no further measurement of the deflections had been made?

Mr. McLURE.—Yes, sir. I also told him that as far as we could see by eye no further change was noticed in the chord since the moving of the traveller. I told him that it was my understanding when I left the bridge that there would be no more metal erected until advices were received regarding these chords. That was my understanding with Mr. Yenser. I asked him whether, in his opinion, it would be all right to go ahead with the erection with the chords in that condition, and he set down and wrote a telegram to the Phoenixville Bridge Company.

Prof. KERRY.—He did not answer you directly?

Mr. McLURE.—No, I do not think he answered me.

Prof. KERRY.—You are not personally aware of the wording of the telegram?

Mr. McLURE.—Not of the exact words—no.

Prof. KERRY.—Did he tell you what the effect of the telegram was?

Mr. McLURE.—He showed it to me.

Prof. KERRY.—And it said practically what?

Mr. McLURE.—Don't add any more weight to the bridge until the facts are carefully considered, or something to that effect; I cannot remember if these are the exact words. Mr. McLure will arrive five o'clock—I think he added to it.

Prof. GALBRAITH.—What was that you said?

Mr. McLURE.—Mr. McLure will arrive at five o'clock.

Prof. GALBRAITH.—Where?

Mr. McLURE.—Phoenixville.

Prof. GALBRAITH.—He was telegraphing to the Phoenix Bridge Company?

Mr. McLURE.—The Phoenix Bridge Company.

Prof. KERRY.—The facts would be, Mr. McLure, that at noon on Tuesday Mr. Yenser stated that he would not increase the load on the bridge by moving the traveller forward?

Mr. McLURE.—In the afternoon it was.

Prof. KERRY.—In the afternoon of Tuesday?

Mr. McLURE.—Yes.

Prof. KERRY.—That on Wednesday morning, without further consultation with you, he commenced to move the traveller out?

Mr. McLURE.—I asked him his reason and he said that he had too many men out.

Prof. KERRY.—Practically moved the traveller out to find work—

Mr. McLURE.—For the number of men he had out.

Prof. KERRY.—That was his reason for it?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—And that you advised him at the time—

Mr. McLURE.—That I thought it was poor policy.

Prof. KERRY.—But at the same time you did not consider that it was dangerously increasing the strain on the member?

Mr. McLURE.—I do not think I told him that.

Prof. KERRY.—But you agreed to that with Mr. Birks?

Mr. McLURE.—I had that in my mind.

Prof. KERRY.—You and Mr. Birks had looked into that and that was your joint conclusion?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—And that when you reached Mr. Cooper and gave him the facts he immediately wired to cease increasing the load on the members?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—Then what followed? You left for Phoenixville?

SESSIONAL PAPER No. 154

Mr. McLURE.—Yes, I got to Phoenixville about five o'clock, went to the office of the Bridge Company and had a talk with Mr. Deans about these chords. I forgot to mention that when I was in Mr. Cooper's office I got a telegram from Mr. Birks—that was about half-past ten o'clock on Thursday morning—saying that—I have the telegram here—do you want to see it?

Prof. KERRY.—It would be as well to read it.

Mr. McLURE.—(reading): 'I do not think we can state positively that chord has buckled since erection; the only definite evidence we have shows the contrary. See my letter with additional data in Phoenixville to-morrow morning. Signed A. H. Birks.'

Prof. GALBRAITH.—At what hour was that telegram sent from here?

Mr. McLURE.—It has 9.45 on it.

Mr. HOLGATE.—That is the receipt in New York.

Prof. KERRY.—When you said to Mr. Yenser that it was poor policy to move the traveller forward you were not thinking at the time of the safety of the bridge but of the difficulty of making the necessary repairs?

Mr. McLURE.—That is what I had in mind—the difficulty of making repairs under the increased stress.

Prof. KERRY.—Referring to Mr. Birks' telegram, he mentions positive evidence there. Did you see that evidence?

Mr. McLURE.—I have not seen any evidence yet that I consider positive.

Prof. KERRY.—Did you see the letter?

Mr. McLURE.—I think Mr. Deans showed me the letter.

Prof. KERRY.—What information was there bearing on this chord?

Mr. McLURE.—He stated his reasons why he thought it was possible that the bend might have been there longer than we thought it had.

Prof. KERRY.—But without anything absolute in the way of measurements?

Mr. McLURE.—Yes, without anything absolute in the way of measurements.

Prof. KERRY.—What followed in your discussion?

Mr. McLURE.—I showed that telegram to Mr. Cooper when I was in New York, and when I got to Phoenixville Mr. Deans and I talked it over. He said that he had a telephone message from Mr. Birks, I think, stating that it was his opinion that the bends in the A-9-L chord were not of recent occurrence, that he was writing a letter explaining the matter and had written a letter explaining the matter which they would receive the following morning. Mr. Deans seemed also to think that the bends had probably been in the chord, if not since it was turned out of the shop, they were there for some time.

Prof. KERRY.—Did he offer you any definite evidence of the fact?

Mr. McLURE.—Nothing, except that he said, I think if you would measure some chords at Blair you would find similar bends.

Prof. KERRY.—Was there anything further in your conversation?

Mr. McLURE.—No, we did not bring it to any definite close on account of our desire to wait for Mr. Birks' letter to see what he had to say about the reasons for not thinking that the bends were of recent occurrence; so that we agreed to meet the following morning when Mr. Birks' letter would be there and talk the matter over further.

Prof. KERRY.—Then what followed?

Mr. McLURE.—I left the office at about six o'clock, and I heard of the collapse of the bridge about 7.30.

Prof. KERRY.—How did that word reach you?

Mr. McLURE.—It reached me by someone telling me that someone had telephoned to them that the bridge had fallen down.

Prof. KERRY.—It was indirect?

Mr. McLURE.—Indirect, yes.

7-8 EDWARD VII., A. 1908

Prof. KERRY.—Did you make any further investigation into the history of that chord while you were still in Phoenixville?

Mr. McLURE.—No, I left early the next morning.

Prof. KERRY.—Simply came straight through to Quebec?

Mr. McLURE.—Came right back.

Mr. STUART.—Will you ask him whether he brought any other instructions to Phoenixville—to Mr. Deans—than were contained in the telegram which Mr. Cooper had sent.

Prof. KERRY.—Did you have any verbal instructions at all to the Phoenix Bridge Company?

Mr. McLURE.—Mr. Cooper told me to go to Phoenixville, see Mr. Deans and tell him that some steps must be taken to strengthen that chord—I think he said—or to repair the chord, and I do not think I told him that that evening at Phoenixville.

Prof. KERRY.—Mr. Cooper's telegram had already been received when you reached Phoenixville?

Mr. McLURE.—Yes, I think Mr. Deans said that he had had a telegram from Mr. Cooper when I reached there.

Mr. STUART.—I thought Mr. McLure said that he showed Mr. Birks' telegram to Mr. Deans.

Mr. McLURE.—Showed it to Mr. Cooper. I do not know whether I showed it to Mr. Deans or not; maybe I did.

Mr. STUART.—At that time Mr. Birks' letter to Mr. Deans had not been received. It was only received on the following morning, and they decided to wait until they received that letter.

Prof. KERRY.—That is what Mr. McLure says in his evidence.

Mr. STUART.—Much of it I miss because he speaks so low.

Prof. KERRY.—Have you heard anything further from Mr. Cooper since your interview with him in New York?

Mr. McLURE.—I stopped to see him on my way back here.

Prof. KERRY.—Did you see him at that time?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—Did he express any opinion at all?

Mr. McLURE.—He said: 'Well, it's that chord.' I only saw him a few minutes; he was not feeling very good.

(In confirmation and explanation of previous statement the witness identified Exhibit No. 41 as correctly showing the measurements made on the morning of Tuesday, August 27, of chord No. 9-L of the anchor arm and chords Nos. 8-R and 9-R of the cantilever arm.)

Prof. KERRY.—Is that correct, Mr. McLure?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—At the time that these measurements were made, Mr. McLure, were the opposite chords in each case examined?

Mr. McLURE.—Not by me.

Prof. KERRY.—You just went over these three chords?

Mr. McLURE.—Yes.

Prof. KERRY.—Practically, in the whole system of inspection, Mr. McLure, there was no means of definitely ascertaining whether these chords were straight or what their deflection from the straight was when they were placed in the bridge? They had not been measured for true, and there was no record of their shop deflections?

Mr. McLURE.—I think not.

Prof. KERRY.—So that any discussion in regard to the time that that deflection took place would be a matter of opinion?

Mr. McLURE.—Well, we knew that every piece, particularly every main member that went into the bridge, had been inspected for just such things as bends in the ribs. We also knew that nothing as large as the bends we had measured, particularly

SESSIONAL PAPER No. 154

in the A-9-L chord, could possibly have escaped an inspection such as we gave that member.

Prof. KERRY.—My recollection of previous evidence is that you and Mr. Birks together made the final inspection of each member before it was put in.

Mr. McLURE.—Mr. Kinloch made the same inspection, too.

Prof. KERRY.—The inspection on the car previous to the hoisting of the member was made by whom?

Mr. McLURE.—Mr. Kinloch and myself, and Mr. Birks, usually. Mr. Birks paid particular attention to the attachment of the attachments.

Prof. KERRY.—You and Mr. Kinloch paid particular attention to the member itself?

Mr. McLURE.—Yes.

Prof. KERRY.—You are absolutely convinced that you would not have passed a member with any such deflection upon it?

Mr. McLURE.—Yes. Of course, I was not here when A-9-L chord was erected. Mr. Kinloch was.

Prof. KERRY (to Mr. Kinloch).—Previous to Mr. McLure coming here did that system of inspecting members on the car before they were placed in position exist?

Mr. KINLOCH.—Yes, sir.

Prof. KERRY.—So that chord 9-L would have been inspected by you previous to unloading from the cars to the traveller?

Mr. KINLOCH.—Yes, sir, and it was also free from any upright members for five or six months, and any one walking over it could have seen it.

Prof. KERRY (to Mr. McLure).—Had you made, for any reason, any definite observation of the condition of the chord previous to the time of the measurement of the chord as shown in Exhibit No. 41?

Mr. McLURE.—Yes, sir, of A-9-L; two or three days before I went to the hospital, the dates of which I have given already, I sighted along each rib of the chord, particularly the rib that had the mark of the chain on, as described by Mr. Kinloch yesterday, to see if there were any bends noticeable, but particularly to see how the bend made by that chain was acting under load and, from my observation then, I am convinced that the ribs were straight.

Prof. KERRY.—That is to say within a deflection of—?

Mr. McLURE.—Within two or three weeks of the accident.

Prof. KERRY.—They were straight to within what wind?

Mr. McLURE.—To within at least half an inch.

Prof. KERRY.—The condition and the progress of the work at that time would be fully recorded; more particularly, I suppose, this would be fully recorded in Mr. Yenser's reports, would it not?

Mr. McLURE.—At the date of the accident?

Prof. KERRY.—At the date of your previous inspection—the position of the cant lever and the number of pieces up at that time?

Mr. McLURE.—Yes, sir. You could get it either from Mr. Yenser's reports or from my books.

Prof. KERRY.—Your books would show just when each member was raised and when the traveller was moved?

Mr. McLURE.—I have a book that shows the date that each member was raised.

Prof. KERRY. Have you a copy of that book with you?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—You might file that also, please.

Mr. McLURE.—I could shorten that up by reading it out of my diary.

Prof. GALBRAITH.—You might do that.

Prof. KERRY.—Do you want to make a statement from that?

Mr. McLURE.—From this book?

Prof. KERRY.—Yes!

7-8 EDWARD VII., A. 1908

Mr. McLURE.—Just as it suits you. That will be the shortest way, I think. You want the condition of the erection at the time I made an inspection of the chord and found it straight. As nearly as I remember the date was August 15. At that time I have recorded as being erected on that day the bottom chord sections of the suspended span B-R and L of sub-diagonals S-P-2-R and L. These chords were connected by pinning diagonal eye-bars T-2-P and L to the hangers T-O-O. That was on the third panel of the suspended span. The main post of the small traveller then would be over post P-1 of the suspended span and I should say the panel was approximately half erected—panel 3.

Prof. KERRY.—The traveller was sitting on the second panel?

Mr. McLURE.—Yes. The tip of the top forward overhang only had been removed.

Commission took recess.

AFTERNOON SESSION—TWELFTH DAY.

The Commission resumed at 2 p.m.

Mr. HOARE put in monthly progress estimates from June, 1904, to July, 1907, accompanied by progress diagrams (filed and marked Exhibit No. 42).

Mr. McLURE, recalled.

Prof. KERRY.—You were familiar with the instructions issued by the Phoenix Bridge Company in regard to erection, Mr. McLure?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—And in all except very minor detail those instructions were absolutely followed?

Mr. McLURE.—Yes.

Prof. KERRY.—In particular were the instructions in regard to the opening at the joints between the several chords of the lower chord followed exactly?

Mr. McLURE.—They could not follow any instructions in regard to the openings. They had to make their own openings. You could not make the openings anything you wanted to.

Prof. KERRY.—Not setting the place originally?

Mr. McLURE.—You could on the anchor arm. On the anchor arm the opening centres are set to a certain elevation. On the cantilever arm the opening in the chord would be made at a certain point and you could not change that if you wanted to.

Prof. KERRY.—You mean that the length of the members absolutely fixed that opening?

Mr. McLURE.—Yes, sir.

Prof. KERRY.—And as it worked out the openings were as anticipated?

Mr. McLURE.—The openings agreed fairly well with what was supposed.

Prof. KERRY.—What do you mean by fairly well?

Mr. McLURE.—They were not always exactly what was indicated on the drawing.

Prof. KERRY.—How much would they vary?

Mr. McLURE.—An eighth of an inch.

Prof. KERRY.—I think you told us that you were not present at the time that the lower chord of the anchor arm was laid?

Mr. McLURE.—No, sir.

Prof. KERRY.—So that you could give us no positive evidence in regard to those openings?

Mr. McLURE.—I know what they were after I got there.