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second, H. P. Dwight, \$93,750, 6.
third, Waddle & Smith, \$121,250, 6.

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 Fuller's additional demand for clearing, 7.
 making his tender, say \$128,750, 7.
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 Sifton, Glass & Co.'s tender for whole line, not for section 1, 9.
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SIFTON, J.

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 on section 1, nor why profits were added, 1330.
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MACKENZIE, HON. A.

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ROWAN, J. H.

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FLEMING, S.

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FLEMING, S.

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Sifton & Co. and Fuller's price as contracted, \$225,100, 1333.

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 managed by the Minister, 47.
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 no Order-in-Council authorizing contract, 48.
 statement of expenditure put in, 60.
 took no part in arrangement of this contract, 1817.
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BROWN, P. J.

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 Thompson & Thirkell ignored by Sutton, 775.
 witness subsequently purchased Davidson's interest, 775.

SUTTON, R. T.

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 Braun to Sutton & Thirkell, 12th December, and reply 16th December (1874), 1070.
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WADDLE, J.

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 Minister attributed it to delay as to security, 1105.
 promised further chance if Thirkell failed, 1106.
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 Glass offered \$10,000 for contract; refused by witness, 1108.
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DAVIDSON, J.

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 or how latter was substituted for former, 1140.
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St. JEAN, Dr.

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FLEMING, S.

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MACKENZIE, Hon. A.

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CONSTRUCTION AND MAINTENANCE—**CONNERS, J. L.**

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STRONACH, J.

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GADDY, J. S.

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ROWAN, J. H.

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JENNINGS, W. F.

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BROWN, P. J.

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OPERATING—**TRUDEAU, T.**

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CONTRACT No. 5.—Railway construction :**TRUDEAU, T.**

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wanted time; refused, 49.
Whitehead and A. H. Clark, same amount, 22 cts., 49.
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WHITEHEAD, J.

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reasons for building Pembina Branch then, 215.
extent of contract, 215.
work remeasured, 215.
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ROWAN, J. H.

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FLEMING, S.

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CONTRACT No. 5 A.—Railway construction :**TENDERING—****TRUDEAU, T.**

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Whitehead's offer reported on by Fleming, 51.
Order-in-Council specifying conditions and limiting cost to \$60,000, 52.
actual cost to 31st December, 1879, \$141,800, 52.
no contract made; treated as extension of contract No. 5, 52.
\$87,589 for work not mentioned in contract No. 5, 53.

CONTRACT No. 5 A.—Railway construction—continued.**TENDERING—continued.****TRUDEAU, T.—continued.**

this portion never submitted to competition, 53.

Braun telegraphs instructions: 22 cts. earth, and other work at prices in contract No. 15, 53.

off-take ditches paid for at 45 cts. as against 23 cts. in contract No. 14, 53.

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Order-in-Council defines specific items as to which prices of contract No. 15 shall apply, 54.

witness cannot say why other prices of No. 15 were made to apply, 54. .
does not know Braun's authority for telegram, 55.

WHITEHEAD, J.

did not tender, 243.

reasons for award of contract; made an offer, 244.

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ROWAN, J. H.

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this work facilitated carrying rails to contract No. 14, 748.

FLEMING, S.

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Braun telegraphed authority, 1347.

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SMELLIE, W. B.

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every item beyond the four mentioned in Fleming's letter paid without authority, 1349.

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BRAUN, F.

thinks instructions to telegraph received from Minister, 1754.

remembers the circumstance, 1755.

cannot state positively his authority to telegraph, 1756.

can find no authority, but message could not have been sent without authority, 1761.

telegram sent four days before receiving Order-in-Council, 1762.

no instructions as to details from Engineer's Department, 1765.

CONSTRUCTION—**FLEMING, S.**

Smellie notified Department as to high prices, 1348.

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MACKENZIE, HON. A.

prices fixed by engineer, of course, 1815.

discussed off-take ditches with Fleming, 1815.

especially careful to authorize nothing not in engineer's report, 1815.

CONTRACT No. 6.—Steel rails, &c.:**TRUDEAU, T.**

public competition invited by advertisement; time postponed, 833.

contractors: Guest & Co., 10,000 tons, 834.

no Order-in-Council awarding contract, 844.

See *Steel Rails*.

CONTRACT No. 7.—Steel rails, &c.:**TRUDEAU, T.**

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contractors: Ebbw Vale Co., 5,000 tons, 834.

no Order-in-Council awarding contract, 844.

See *Steel Rails*.

CONTRACT No. 8.—Steel Rails, &c.:**TRUDEAU, T.**

Mersey Steel Co. tendered for 5,000 to 10,000 tons, 834.

Cox & Green lower price, 834.

awarded contract for 20,000; why increased, 834.

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CONTRACT No. 8.—Steel Rails, &c.—continued.**TRUDEAU, T.—continued.**

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 thinks lower tenderers applied to first, 842.
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 of acceptance, 843.
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COOPER, J.

of Cooper, Fairman & Co., 915.
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FAIRMAN, F.

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FLEMING, S.

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 enquired if more favourable purchase could be made elsewhere, 1357.
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 See *Steel Rails*.

CONTRACT No. 11.—Steel rails, &c.:**TRUDEAU, T.**

contractors: Naylor, Benzon & Co., 5,000 tons, 834.
 witness cannot explain correspondence between Cooper and Buck-
 ingham, 843.

COOPER, J.

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FAIRMAN, F.

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CONTRACTS Nos. 6 TO 11.—Steel rails, &c.:**TRUDEAU, T.**

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 tenders and correspondence in return of 2nd March, 1876, to House
 of Commons, 833.
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 1817.
 no record of Buckingham's replies to Cooper's telegrams, 1817.
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 tary should take place, 1818.
 the Minister decided upon these contracts himself, witness's judg-
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REYNOLDS, T.

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FLEMING, S.

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MACKENZIE, HON. A.

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ENGINEERING—**MURDOCH, W.**

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FLEMING, S.

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SMITH, M.

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MACKENZIE, HON. A.

\$41,000 paid Foster on Fleming's recommendation, 1804.
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 Charters withdrew offer, 62.
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SITTON, J.

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FLEMING, S.

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ENGINEERING—**TRUDEAU, T.**

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- SIFTON, J.**
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- FLEMING, S.**
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TENDERING—

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MURDOCH, W.

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ROWAN, J. H.

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FLEMING, S.

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SMITH, M.

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CONSTRUCTION.**RUTTAN, H. N.**

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SIFTON, J.

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CARRÉ, H.

- construction commenced before location of southerly line, 149.

WHITEHEAD, J.

- took over completion of Sifton & Ward's contract under agreement approved by Minister, having necessary plant, which original contractors had not, 238.
- has been filling Cross Lake since spring of 1879, 239.
- two steam-shovels, three locomotives and 100 men at work night and day, 239.
- thinks big bay at Cross Lake might have been avoided, 246.

CLARK, A. H.

- employed two years as walking boss, 259.
- contractors' claims for compensation, 260—264.

MOLLOY, J.

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- Julius Muskeg, 315.
- re-location of line, 319.
- witness's claim on Government, 321.

WHITEHEAD, C.

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ROWAN, J. H.

- contractors' claims: delay, compensated for by extension, 704.
- changes of location, advantageous to contractor, 704.
- coffer-dams, foundationless, 704.
- use of contractor's roads, worthy of consideration, 705.
- Selkirk station ground, recommended, 705.
- two miles of contract transferred to Whitehead, 706.
- original contractors have no claim under this, 707.
- question of haulage thoroughly discussed, 709—711.

FLEMING, S.

- Carré's southerly line, 1376.
- some delay, but contractors magnify difficulties, 1378.
- explains why no maximum limit to haul, 1616.
- limited by discretionary power of engineer, 1616.
- limit established in subsequent specifications, 1617.

SMITH, M.

- Julius Muskeg, 1575.
- muskeg can only be measured in excavation, 1575.
- muskeg should have been sounded, 1576.
- never knew work in Europe being let without fullest previous information, 1576.
- witness advised cross-logging, 1579.
- suggested no material improvement in location, 1579.
- Chief Engineer returned in spring of 1877, 1580.
- a mile and a-half rock, which should have formed part of contract No. 15, subsequently transferred to Whitehead, 1609.
- Sifton's claim, 1610
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MACKENZIE, Hon. A.

- transfer of Cross Lake Section to Whitehead, 1807.
- mere substitution of contractors, 1808.
- See *Engineering*.

CONTRACT No. 15.—Railway construction :**TENDERING—****TRUDEAU, T.**

- submitted to public competition, and let after three advertisements, 67.
- lowest tender, A. P. Macdonald & Co., 68.
- second lowest, Martin & Charlton, 68.

CONTRACT No. 15.—Railway construction—*continued.*
TENDERING—*continued.***TRUDEAU, T.—*continued.***

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WHITEHEAD, J.

lives at Winnipeg since 1874, 211.
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did not get contract on his tender, 216.
joined Sutton & Thompson after consulting Minister, 216.
paid Sutton & Thompson \$10,000, 218.
admitted by Order-in-Council as sole contractor, 218.
correspondence with Minister respecting Charlton, 218.
information as to tenders easily obtainable at Ottawa, 220.
the \$10,000 paid to Sutton & Thompson by McDonald in witness's presence, 220.

Senator McDonald put up witness's security, 221.

agreed to pay him 10 per cent. and share profits with his son equally, 221.

Mitchell McDonald neither wealthy nor experienced, insolvent at the time, 222.

paid him \$20,000 which he gave to his father, 222.

subsequent settlement with McDonald, \$112,000, 223.

Senator McDonald not satisfied with arrangement, 223.

reasons why witness was willing to adopt tender \$188,000 less than his own, 228.

respecting Charlton, 228.

McDonald paid Charlton \$20,000, 229.

arrangement with Charlton made a few days before contract was let, 231.

further evidence as to transaction with Charlton, 236.

relative position of tenders well known, 236.

produces agreement and statements of account with Senator McDonald, 241.

Senator McDonald charged 10 per cent. on security to Government though that security was in lands, 242.

money paid Charlton at Prescott station, not Cornwall, as stated, 606.

further as to agreement with McDonald, 612.

MACDONALD, A. P.

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SUTTON, R. T.

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Whitehead knew how tenders stood, 1045.

MACKENZIE, HON. A.

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not aware of Senator McDonald's interest in contract, 1809.

McDonald denied effecting the withdrawal of Charlton, 1809.

why Martin was not considered, 1810.

Kane & McDonald wanted to impose a condition, 1810.

ENGINEERING—**SURVEYS.****TRUDEAU, T.**

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progress estimates did not give that information, 69.

no record of estimated quantities kept, 70.

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CONTRACT No. 15.—Railway construction—*continued.**ENGINEERING—continued.*SURVEYS—*continued.*

CARRÉ, H.

- in charge of location survey, June, 1874, 129.
 - party over forty men, 129.
 - so engaged till January, 1875, 129.
- witness afterwards took soundings on Red River, while the party ran a line from Shoal Lake to Selkirk, 129.
- in December, 1874, asked to send in plan and profile, 129.
 - made it roughly on unprinted wall paper, 130.
 - Frank Moberly and party calculated the quantities from it in Ottawa, 130.
 - thinks the profile made from it correct, 130.
 - not cross-sectioned or test-pitted, 130.
- when in Ottawa, scheduled out quantities, they were enormous, 131.
- asked to find a better route, 131.
 - returned for that purpose, June, 1875, 131.
 - the survey was exploratory and location combined, 131.
 - line finished in December, 1875, 131.
 - thinks party consisted of fifty, 131.
- ran also the Dalles line at same time, 132.
- returned to Ottawa, until May or June, 1876, 132.

FLEMING, S.

- thinks cross-sections taken two years before advertising for tenders, 1379.
- essential in such country, 1379.
- reads his report of May 16th, 1879, accounting for discrepancies, 1380.
- corrects statement as to cross-sections, previous page, 1380.

SMELLIE, W. B.

- reads letter from Chief Engineer, respecting Carré's evidence, 1484.
- west of Cross Lake, Carré undertook no more than trial location, 1485.
- thinks there is no point in Fleming's letter, 1486.
- never saw Ferrest's line until yesterday (22nd April, 1881), 1488.
- cannot say if Carré's plans of 1875 survey are in the Department, 1488.

SMITH, M.

- found the works would be heavy, 1573.
 - grades about 40 feet, 1573
- terminus established by letting section 14, 1574.
- was not at Cross Lake in 1876, 1574.

CONSTRUCTION.

RUTTAN, H. N.

- became engineer for contractor Whitehead on Fleming's recommendation, April, 1877, 25.
- reached section 15 in May, 1877, 25.
- permanent location not then completed, 25.
- ground very rough, could get no cross-sections, 25.
- alignments and grades changed, 26.
- instructions as to rock bases in water stretches, 26.
- Carré the division engineer in charge, 27.
- final instructions not practicable, 27.
- rock protection walls authorized by Rowan, 28.
- Carré's instructions in June, 1877, to borrow earth, 29.
- differences between contractor's engineer and Carré as to classification of material, 30.
- thinks Government in April, 1880, owed Whitehead \$60,000 more than admitted, 31.
- at that date work taken out of Whitehead's hands, 31.
- Rowan's instructions as to earth embankments in July, 1877, 31.
- saw on first inspection that all material for embankments could be borrowed, no trestle work necessary, 32.
- not enough timber on section to build trestle work, 36.
- should have been well known after five years' surveys, 36.

CARRÉ, H.

- appointed engineer on construction, May or June, 1876, 132.
- original location line of 1874 adopted, 132.
- re-located whole section between June and December, 132.

CONTRACT No. 15.—Railway construction—continued.
ENGINEERING—continued.**CONSTRUCTION—continued.****CARRÉ, H—continued.**

- four assistants took measurements of cross-sections and were responsible for their correctness, 133.
 thinks final returns were correct, 134.
 cross-sections completed in March, 1877, 134.
 tenders asked for about time cross-sections were commenced, 134.
 quantities not calculated from cross-sections till 1878, 134.
 changes in grade and alignment, increased rock cuttings and earth excavations, 136.
 without specific data, tenders were necessarily speculative, 138.
 accurate quantities conducive to economy, 138.
 cross-sections necessary to accurate calculations, 154.
 quantities calculated from cross-sections, January, 1878, 154.
 after lowering grade two feet, 154.
 rock cutting increased by lowering grade, 113,200 yards, 154.
 earth excavations increased by changes, 224,000 yards, 155.
 line thereby improved, 155.
 increased cost mainly due to changes and substitution of earth embankments for trestle work, 156.
 deep fillings in water stretches, 160.
 Cross Lake probably requires 222,000 yards, equal to \$82,000, 161.
 trestle work probably \$17,500, 161.
 if filled according to original specification, full rock base and trestle, \$345,832, 162.
 as actually executed, \$142,500, 162.
 trestle cheaper in heavy land voids, 163.
 instructions from superior officer, 164.
 refused contractors certain information, and why, 164.
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 meantime change of grade, 165.
 grade determined in Ottawa four months after contract commenced, 166.
 solid rock bases found impracticable, 166.
 witness proposed protection walls, approved October, 1877, by Rowan, 166.
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 ordered by Rowan not to touch a stake, 169, 1476.
 Rowan's inspection of line described, 170.
 witness's suggestions ignored at Ottawa, though supported by Rowan, since carried out by Schreiber, 171.
 in charge of construction four years, 171.
 Haney made superintendent in June, 1880, 171.
 Rowan's letter permitting earth borrowing produced, 172.
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 statement showing comparative quantities for rock bases and protection walls respectively, produced, 175.
 differences between Government and contractor's engineers as to:
 bottoms left in cutting, 179.
 loose rock, 180.
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 Fleming's and Smith's interpretation of loose rock clauses, 181—187.
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CONTRACT No. 15.—Railway construction—*continued.*ENGINEERING—*continued.*CONSTRUCTION—*continued.*CARRE, H.—*continued.*

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WHITEHEAD, C.

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WHITEHEAD, J.

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 his reasons for this statement, 225
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 was not examined before Parliamentary Committee, 231.
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 got advance about \$45,000 on plant, 232.
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 Fraser & Grant's names suggested by Cooper, Fairman & Co., 234.
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 expects net proceeds of contract as carried out by Government, 236.
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FRASER, J. H.

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ROWAN, J. H.

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 how far Carre was responsible for discrepancy, 740.
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CONTRACT No. 15.—Railway construction—continued.
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- SCHULTZ, J., M.P.**
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- BROWN, G.**
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 Whitehead attacked by *Winnipeg Free Press*, wanted means of defence, 728.
- TUTTLE, C. R.**
 Cooper, Fairman & Co. furnished contractors, not the Government, with supplies, 764.
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- COOPER, J.**
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- HAGGART, J., M.P.**
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- POPE, HON. J. H.**
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- FLEMING, S.**
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 Cross Lake, 1608.
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SCHREIBER, C.

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financial inability of contractor led to Government assuming work in March, 1880, 1770.
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work too far advanced to consider advisability of any alternative lines, 1771.

CARRÉ'S ALTERNATIVE SOUTHERN LINE.**RUTTAN, H. N.**

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CARRÉ, H.

southerly route would have saved \$275,000, 140.
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if adopted, \$68,000 expended on section 14, would have been lost, 1471.
Julius Muskeg would have been avoided, 1472.

ROWAN, J. H.

views as to alternative southern line, 702.
Carre's southerly line in some respects favourable, 731.
but work executed on contract No. 14 would have had to be abandoned, 732.
had route west been south of Lake Manitoba, Carre's line would have been cheaper, 732.

FLEMING, S.

suggested line compared with present one, 1376.
thinks rough land less, but quantities and mileage greater, 1376.
work on contract No. 14 not proceeded so far that abandonment precluded adoption of suggested line, 1376.
still thinks selection of existing route judicious, 1377.
suggested line might have been preferable had Winnipeg been objective point, 1380.
produces letter of 4th May, 1881, from Rowan, asserting saving only \$100,000 from its adoption while lengthening line five miles and a-half, 1630.

SMITH, M.

witness's views endorsing this route, 1596.
See *Engineering*.

CONTRACT No. 16.—Railway construction :**TRUDEAU, T.**

extension, Douglas to Nipissing, 846.
no public competition; Order-in-Council granting \$12,000 per mile, 846.
work abandoned, 846.
letter of President, 22nd August, 1874, praying for subsidy, 1215.
reported on by Chief Engineer, 8th October, 1874, 1215.
Order-in-Council, 4th November, 1874, ratified by House of Commons, 13th March, 1875, 1215.
company contract with A. B. Foster, 1215.
26th October, 1875, Foster reports difficulties, 1216.
10th February, 1877, route by Ottawa Valley proposed, 1217.
approved by Order in Council 18th April, 1878; subsidy, \$1,440,000, 1218.

CONTRACT No. 16.—Railway construction—continued.

- TRUDEAU, T.—continued.**
 formal contract thereunder with McIntyre & Worthington, 1218.
- FLEMING, S.**
 route not chosen on engineering grounds, 1366.
 contract let on walking exploration, 1366.
 witness's authority for action, Order-in-Council, 4th November, 1874,
 1381.
- MACKENZIE, HON. A.**
 as to loan of rails to Foster, 1811.

CONTRACT No. 17.—Transportation of rails:

- TRUDEAU, T.**
 arranged through Cooper, Fairman & Co., 846.
 Braun telegraphs offer to Cooper, Fairman & Co., 846.
 further correspondence in relation thereto, 847.
 no correspondence as to specific contract with Anderson & Co., the
 shipowners, 847.
- FAIRMAN, F.**
 Cooper, Fairman & Co.'s offer at £2 per ton, 1182.
 witness acted in shipper's interest, 1183.
 did not hear that less than £2 was paid, or that more than £2 was
 agreed on, 1185.
- FLEMING, S.**
 witness not concerned in this contract, 1381.

CONTRACT No. 18.—Transportation of rails:

- FULLER, R.**
 tendered, but did not get contract, 472.
 contract given to Red River Transportation Co., 473.
 witness's offer the lowest, 473.
 namely, \$13.50 per long ton, American currency, from Duluth to
 Winnipeg, or \$15 to Selkirk, 473.
 no conditions as to channel of Red River, 473.
 competing lines justified witness's offer, 1294.
 remarks as to long and short ton, 1295.
- ROWAN, J. H.**
 produces letter from Ottawa, 25th June, 1875, his first communica-
 tion on the subject, 731.
 told contractor to land rails at Selkirk; he refused, 748.
- TRUDEAU, T.**
 no formal contract, 848.
 no advertisement for tenders, 848.
 produces Fleming's report on Fuller & Milne's offer, 848.
 which is simply acknowledged, 849.
 cannot explain why another offer at a higher price was accepted, 850.
 nine thousand short tons for Pembina Branch, the rest for Selkirk,
 967.
 Fuller's offer more favourable than that accepted by \$13,500, 967.
 that advantage increased if offer based on long ton, 967.
 no conditions by Fuller as to depth of water, 968.
 rails did not reach Selkirk by water, 967.
 necessity for their transport hastened Pembina Branch North, other-
 wise \$11,500 additional expense incurred, 968.
 Fleming estimates transport expenses saved by premature building of
 Pembina Branch North, at \$30,000, 968.
 possibly verbal arrangement with Hill made by Minister before receiv-
 ing Fuller's offer, 969.
 witness places the loss at \$15,000, 970.
- CAMPBELL, G.**
 a ton of rails understood to be 2,240 lbs., 1120.
- FLEMING, S.**
 can recollect nothing about it, 1382.
 the long ton understood in respect of rails unless otherwise specified,
 1398
- MACKENZIE, HON. A.**
 reasons why Kittson get contract at higher price than Fuller, 1812.
 does not remember whether question of long or short ton was con-
 sidered, 1813.
 See Contract No. 28.

CONTRACT No. 19.—Engineer's house at Read :

TRUDEAU, T.
amount of contract, \$1,600, 867.
contractor : Moses Chevette, 867.

CONTRACT No. 20.—Transportation of rails :

TRUDEAU, T.
arranged through Cooper, Fairman & Co., 927.
public competition invited ; tenders produced, 927.
contractors not mentioned in schedule, 927.
E. Samuel lowest tenderer, \$6, 927.
Order-in-Council 30th April, 1875, awards to Cooper, Fairman & Co.,
928.
contract claimed under Mersey Co.'s tender, 929.
witness thinks their claim not a good one, 931.
\$12,400 would have been saved had Perkins & Co.'s offer been accepted
instead of Cooper, Fairman & Co.'s, 931.

FAIRMAN, F.
no authority from Mersey Co. to tender for inland transport, 1187.
Cooper, Fairman & Co. interested with contractors, 1190.
tender in own names, 1191.
no reference to transportation in Mersey Co.'s tender, 1192.
price, with extras, \$6.20, 1193.

FLEMING, S.
had nothing to do with this, 1382.

CONTRACT No. 21.—Transportation of rails :

TRUDEAU, T.
tenders asked for by Morin, 867.
cannot explain how Cooper & Co. had prior information, 867.

FLEMING, S.
managed entirely by the Deputy Minister, 1382.

CONTRACT No. 22.—Transportation of rails :

TRUDEAU, T.
offered to public competition by circular, 932.
Chief Engineer's report recommending Holcomb & Stewart produced,
932.

FLEMING, S.
explains his recommendation, 1382.

CONTRACT No. 23.—Railway ties :

TRUDEAU, T.
let after public competition, 868.
satisfactorily fulfilled, 868.

CONTRACT No. 24.—Erection of a house :

TRUDEAU, T.
amount of contract, \$3,500, 868.

FLEMING, S.
instructed, 15th May, 1875, to authorize Hazlewood to enter into
arrangements as above, 1383.

CONTRACT No. 25.—Railway construction :**TENDERING—**

TRUDEAU, T.
report of engineer, 72.
Purcell lowest tenderer, 72.
tenders opened on day stated in advertisement, usual delay of two
or three days not accorded, 72.

RYAN, H.
interested in tender of Brown, Brooks & Ryan, 1220.
not lowest and not accepted, 1220.
contract awarded to Purcell, whom witness joined, 1220.
Purcell's tender lower than any other by \$100,000, 1239.

CONTRACT No. 25.—Railway construction—continued.
TENDERING—continued.

- FLEMING, S.**
 Purcell lowest tenderer, 1384.
 bonus to hasten construction, 1384.
 figures on tender altered, 1384.
 explanation of witness's part in transaction, 1386.
 respecting increase of bonus and penalty, 1387.
- McLENNAN, R.**
 had no communication with contractors before contract awarded, 1535.

ENGINEERING—**SURVEYS.**

- FLEMING, S.**
 object of surveys to obtain most favourable line irrespective of soil, 1390.
 summer surveys were made but no boring done, 1390.
 how contents of embankments should be paid for, 1391.
 these views not of general applicability, 1391.
 two and a-half yards of muskeg moved to make one in embankment, 1392.
 thinks borrowing might have been resorted to, 1393.
 took steps to prevent similar difficulty in future, 1393.
 facts as to difference between McLennan's and Bell's measurements, 1396.
 has not been on ground himself, 1397.
- McLENNAN, R.**
 in winter of 1875-'6 made survey north of Lake Shebandowan, 1534.
 profile sent to Ottawa, 1534.
 thinks estimate of quantities based on this, 1535.

CONSTRUCTION.

- TRUDAU, T.**
 estimates considerably exceeded, 73.
 re-measurement ordered, reducing first quantities, 73.
- CADDY, J. S.**
 position of section when he took charge, 649.
 much muskeg, 649.
 considerable settlement of road-bed, 650.
 disputes with contractors, 654.
 subsidence of embankments, 654.
- RYAN, H.**
 work completed, October, 1879, 1220.
 dispute regarding quantities, 1221.
 re-measured by L. G. Bell, excess chiefly in earth and rock, 122.
 McLennan made first measurements, 1222.
 piling ten times as much as estimated, 1223.
 discrepancy due to ignorance of country, location made in winter, 1223.
 shrinkage of embankment, 1224.
 increase in off-take ditches, 1224.
 changes increased cost but shortened and improved line, 1224.
 shrinkage of muskeg, 1225.
 could easily have ascertained depth of bogs, &c., in winter, 1227.
 bog in all cases lying on hard material, 1227.
 alignment is right, 1227.
 reason for lowering grades and increasing number of ditches, 1228.
 road somewhat narrower than specified, 1229.
 reason why re-measurements could not be correct, 1230.
 no allowance in estimates for muskeg earth, 1245.
- FLEMING, S.**
 quantities greatly in excess, 1388.
 thought at the time information sufficient for letting work, 1388.
 nature of soil not understood, 1389.
 principles which should guide an engineer as between Government and contractor, 1631.
 principles applied to muskeg question, 1632.
 Government should fix price for muskeg material if none in contract, 1633.

CONTRACT No. 25.—Railway construction—continued.**ENGINEERING—continued.****CONSTRUCTION—continued.****FLEMING, S.—continued.**

sub-section 3 of clause 17 classes muskeg as earth, 1634.
 earth measured in excavation, 1636.
 thinks muskeg should be measured in embankment, 1636.
 directions to stop further certificates, 1654.
 on discovering cause of excess, sent instructions to engineers, 1655.
 specific instructions to Jennings, 1656.
 instructions to measure muskeg in embankment, 1657.
 Order-in-Council governing procedure thereafter, 1658.

MCLENNAN, R.

quantities turned out much larger than estimate, 1536.
 made material changes, 1536.
 shortened line nearly two miles, 1537.
 changes hastened completion of line, 1537.
 and decreased cost, 1538.
 good deal of muskeg, 1539.
 subsidence of muskeg in embankments, 1539.
 general sinking of muskeg country when drained, 1540.
 some reasons for discrepancy between the two measurements, 1541.
 measured material in excavation, 1544.
 tunnel of 515 feet, 1546.

SMITH, M.

chief causes of extra cost, 1604.

SMELLIE, W. B.

tunnel decided on in 1876, 1614.

SCHREIBER, C.

held different views from Fleming as to muskeg measurement, 1772.
 must be measured as earth work in excavation, 1772.
 substitution of earth for muskeg might have lost two years without
 increasing efficiency, 1773.
 earth five times the weight of dry muskeg, 1773.
 excavation of muskeg necessary to drain country, 1773.
 muskeg "blinded" the finest of embankments, 1774.
 sinkage *vs.* shrinkage, 1775
 results of re-measurement compatible with correctness of original
 measurement, 1776.

MACKENZIE, HON. A.

as to price of tunnelling, 1816.
 See *Engineering*.

CONTRACT No. 26.—Construction of engine house :**TRUDEAU, T.**

public competition invited, 933.
 awarded to lowest tenderer, 933.
 work satisfactorily performed, 933.

FLEMING, S.

immaterial evidence, 1398.

CONTRACT No. 27.—Transportation of rails :**TRUDEAU, T.**

public competition invited, 934.

FLEMING, S.

his evidence herein, 1398.

CONTRACT No. 28.—Transportation of rails :**TRUDEAU, T.**

based on an offer from Kittson, 1046.
 engineer's recommendation subsequent to Kittson's offer, 1046.
 no record of previous communication with Kittson, 1046.
 no other competition, 1046.
 expenditure included under contract No. 18, 1946.
 amount involved and properly chargeable against this contract,
 \$143,000, 1047.
 amount expended under contracts Nos. 18 and 28, \$215,679.52, 1153.
 contract No. 18 for 5,000 short tons, 1153.
 contract No. 28 not the result of public competition, 1153.

CONTRACT No. 28.—Transportation of Rails—continued.

- FLEMING, S.**
recommended that provision should be made for transport May 13th, 1876, but took no further part in this specific arrangement, 1399.
- MACKENZIE, Hon. A.**
cannot say why not subjected to public competition, 1814.
See *Contract No. 18.*

CONTRACT No. 29.—Railway spikes:

- TRUDEAU, T.**
awarded after advertisements and competition, 934.
- FLEMING, S.**
witness prepared specifications; no other part in this transaction, 1399.

CONTRACT No. 30.—Bolts and nuts:

- TRUDEAU, T.**
contractors, Cooper, Fairman & Co., agents for Robb & Co., 935.
offer accepted without competition, 935.
how contract came to be made, 935.
recommended by Fleming, 936.
- FAIRMAN, F.**
Cooper, Fairman & Co. had to pay duties, 1197.
contract brought about by letter of Cooper, Fairman & Co., 1198.
cannot remember as to state of market, 1198.
price received \$101 per ton, 1198.
learned since that bolts and nuts were offered at a lower figure, 1199.
no explanation why Government should accept a higher offer, 1199.
- FLEMING, S.**
cannot explain why he recommended this contract, 1399.
thinks it quite likely he did not give it much attention, 1400.
- MACKENZIE, Hon. A.**
made with Cooper, Fairman & Co. without public competition, 1814.
cannot say if steps were taken to get better offer, 1814.

CONTRACT No. 31.—Bolts and nuts:

- TRUDEAU, T.**
no public competition, 937.
Cooper, Fairman & Co.'s offer accepted on Fleming's recommendation, 937.
- FAIRMAN, F.**
offer spontaneous, 1200.
could not say if the market had fallen, 1200.
interview with Minister and Deputy, 1200.
- FLEMING, S.**
no recollection about it, 1401.
in recommending it no doubt thought the proposal was a reasonable one, 1401.
- MACKENZIE, Hon. A.**
a spontaneous offer, accepted without public competition. 1814.

CONTRACT No. 32.—Railway spikes:

- TRUDEAU, T.**
public competition invited, 937.
prices varied from \$54.95 to \$75 per ton, 938.
Cooper, Fairman & Co.'s tender 5 cts. per ton less than next tender, 938.
- FAIRMAN, F.**
Cooper, Fairman & Co. offered to supply spikes at price in July, 1876, 1201.
cannot explain how he knew that 100 tons were wanted, 1201.
cannot speak as to relative prices in July, 1876, and January, 1877, 1202.
soon after tendered at \$54.95 instead of \$57, 1202.
Pillow, Hersey & Co. tendered at \$55, 1202.
Cooper, Fairman & Co. often worked with them, 1202.
cannot recollect details, 1203.
- FLEMING, S.**
as to Cooper, Fairman & Co.'s letter of 19th July received before tenders were invited, witness cannot explain, 1401.

CONTRACT No. 32 A.—Engineers' houses :**TENDERING—****TRUDEAU, T.**

let by public competition through Hazlewood on Fleming's authority, 963.

no record of other authority, 964.
expenditure, \$17,730, 964.**FLEMING, S.**

Hazlewood had general authority, 1402.

CONSTRUCTION—**TRUDEAU, T.**

explanation as to excess of price, certain materials burnt, M. Smith's recommendation as to delaying erection, 990.

CONTRACT No. 33.—Railway construction :**TRUDEAU, T.**

Kavanagh's tender the lowest, 55.

contractors failed to execute the work; taken out of their hands, 56.
subsequently done by days' work, 57.**ROWAN, J. H.**

ordered to take work out of contractors' hands and complete by days' labour, 749.

KAVANAGH, T.

witness's the lowest tender; contract offered to him, 835.

partner objected to by Mackenzie, 836.

Murphy & Upper took contract at his figures, witness consenting, 836.

further evidence, 840.

MACDONALD, A. P.

about Kavanagh's relations with Falardeau, 981.

FLEMING, S.

contract entered into during witness's absence, 1402.

CONTRACT No. 34.—Transportation of rails :**TRUDEAU, T.**

let by public competition, 956.

transportation from Fort William included in this contract in Fleming's report of 1879, improperly so placed, 957.

the contractors were the same, the North-West Transportation Co., 957.

that work let without public competition, 957.

Fort William to Emerson, \$18; same price as from Kingston, 965.

arranged for by correspondence authorized by Minister, amount \$27,864, 966.

knows no reason why it should be included under contract No. 34, 966.

CAMPBELL, G.

twenty years' experience freighting, 1119.

\$1.50 gross ton fair rate from Fort William to Duluth, 1120.

1873 to 1879 cheap years, 1120.

witness's line carried mails on Lake Superior in 1874 and 1875, 1120.

in fall of 1878 Collingwood line available in competition on Lake Superior, 1120.

further evidence as to prices of Lake Superior freight, 1121—1125.

FLEMING, S.

knows very little about it, 1402.

MACKENZIE, Hon. A.

does not remember the facts, 1816.

CONTRACT No. 35.—Railway spikes :**TRUDEAU, T.**

spikes made at Montreal, 957.

other tenders would have been lower minus duty, 967—968.

duty always considered in foreign tenders, 958.

FAIRMAN, F.

5 cts. lower than the next highest tender, 1203.

not the result of departmental information, 1203.

FLEMING, S.

nothing to do with it, 1403.

CONTRACT No. 36.—Railway ties :

- TRUDEAU, T.**
 tenders opened by Nixon, 57.
 management left to Marcus Smith, 58.
 considers Nixon made proper selection, 58.
 Robinson's tender accepted by Order-in-Council, 58.
 delays in execution, 58.
 contract taken out of contractor's hands, 58.
- ROWAN, J. H.**
 Robinson failed to perform his contract, 749.

CONTRACT No. 37.—Railway construction :*TENDERING—*

- TRUDEAU, T.**
 submitted to public competition, 993.
 work authorized by Order-in-Council, 2nd September, 1878, 993.
 let to lowest tenderers, Heney & McGreevy, 993.
 no report by engineer, 994.

ENGINEERING—

- SMITH, J. N.**
 became a partner with Government's consent, 949.
 work stopped by Government, 950.
 nature of claim against Government, 950.
 actual outlay \$100,000, 951.
 loss of contemplated profits, 951.
- TRUDEAU, T.**
 work stopped by Orders-in-Council, 995.
 date, 25th July, and 14th August, 1879, 995.
 contractors' alleged claim under consideration, 995.
 McGreevy withdrew and Heney took other partners, 996.
- TUPPER, SIR CHARLES.**
 reasons for cancelling the contract, 1275.

CONTRACT No. 38.—Neebing Hotel :

- TRUDEAU, T.**
 competition invited and lowest tender accepted; amount involved,
 \$3,400, 958.
- FLEMING, S.**
 not in Canada at the time, 1402.

CONTRACT No. 39.—Transportation of rails :

- TRUDEAU, T.**
 public competition invited, 958.
 Braun telegraphs Robson, Victoria, to advertise for tenders, 12th
 June, 1878, 973.
 Order-in-Council passed 13th July, 974.
 letter from Robson, 19th June, suggesting extension of time as
 likely to lower offers, 974.
 no record as to any consideration of this, 974.
 work stopped 31st October, 974.
 rails not then required at Yale, 974.
 nothing to show whether weight of ton was considered or not, 975.
- FLEMING, S.**
 not in Canada at the time, 1402.

CONTRACT No. 40.—Engine house :

- TRUDEAU, T.**
 public competition invited, 973.
 Gouin & Co. lowest tenderers, 973.
 authorized by Order-in-Council, 973.
 satisfactorily completed, 973.
 explains extras under this contract, 991.

CONTRACT No. 41.—Railway construction :**TENDERING—****TRUDEAU, T.**

submitted to public competition after advertising, 75.
 time for receiving tenders extended twice, 76.
 lowest tender, Marks & Conmee, 76.
 correspondence as to Purcell and others being admitted, 76.
 this correspondence subject of a return to the House, 76.
 two-fold condition as to time of completion, 77.
 no difficulty with contractors, 77.
 Chief Engineer's report of tenders 40 and 41 produced, 78.

BOWIE, A.

one of the sureties of Charlebois & Co., 1142.
 took no part in arriving at prices, 1143.
 not aware of any information having been given by officers, 1144.

RYAN, H.

witness's tender not the lowest, 1231.
 work awarded to Marks & Conmee, 1231.
 whom witness joined, 1231.
 no Government influence, 1232.
 Marks' prices in some cases very low, 1232.
 utilization of plant the main inducement to join contractors, 1239.

TUPPER, SIR CHARLES

Marks & Conmee lowest on A, not sufficient financial standing, 1264.
 asked if they could strengthen themselves, 1264.
 no suggestion as to acceptable names, 1265.
 Marks & Conmee bore loss arising from their errors in tendering, 1275.

FLEMING, S.

time extended to obtain more accurate quantities, 1403.
 separate tenders lower than combined, 1404.
 recommended that tenders for short periods should not be entertained, 1405.
 would have preferred letting combined sections to men of known capacity, 1406.
 does not recollect objecting to pecuniary standing of Marks & Conmee, 1410.
 no recollection of conversations with Purcell & Ryan, 1410.
 pointed out to Minister mistake in tender and suggested contractors should be informed of it, 1411.
 Minister insisted on their executing contract according to tender, 1411.
 after the experience on contract No. 25, no special provisions made as to muskeg country, 1412.

ENGINEERING—**CADDY, J. S.**

witness's opinion as to contractors' prices, 655.
 about muskeg earth, 655.
 inconsistent prices, 656.
 deviations result in clay instead of rock, 657.

RYAN, H.

alignment considerably changed, 1234.
 changes will save \$300,000, 1234.
 made by Bell and Middleton in 1879, 1234.

FLEMING, S.

instructions to Jennings and others as to measuring muskeg earth, 1414.
 pressed importance of despatch on Minister, 1418.
See Engineering.

CONTRACT No. 42.—Railway construction :**TENDERING—****TRUDEAU, T.**

usual public competition, 78.
 same advertisement as contract No. 41, 78.
 similarly reported to the House, 78.
 lowest tender, Morse, Nicholson & Marpole, 78.
 who withdrew their tender, 78.
 second lowest, Andrews, Jones & Co., 78.
 who failed to make deposit, 78.
 third lowest and successful tender, Fraser, Grant & Pitblado, 79.
 as to introduction of new names, 79.
 no disputes between contractors and Department, 80.
 Chief Engineer's report of tenders for 40 and 41 produced, 80.
 respecting irregular tenders, 80.
 none lower than tender accepted, 81.

CONTRACT No. 42.—Railway construction—*continued.**TENDERING—continued.*

FRASER, J. H.

of Fraser, Grant & Pitblado, 247.
 firm put in tenders for sections A and B and one for the whole, 248.
 contract first awarded to Nicholson, Morse & Co., 248.
 who were negotiating for their security when witness first became acquainted with them, 249.
 supposed that Andrews, Jones & Co. got eight days to put up their deposit, 250.
 Manning wanted to take an interest, 251.
 terms agreed upon, 252.
 understood from one of Manning's firm that Andrews, Jones & Co. would fail to put up security, 252.
 thinks Andrews, Jones & Co. had ample time to furnish security had they wished, 255.
 Fraser, Grant & Co. sold out to Manning, Shields & McDonald, 256.
 first intimation of Close's interest, 643.
 witness not privy to arrangement, 644.
 general impression that Andrews, Jones & Co. would not put up security, 644.

MCDONALD, J. J.

of the firm of Manning, Shields & McDonald, 299.
 joined Fraser, Grant & Co., the contractors, 299.
 arrangements provisionally made before contract was let, 299.
 subsequently bought out Fraser, Grant & Co., 302.
 respecting arrangement with P. G. Close, one of Morse & Co.'s bondsmen, 303.
 respecting information gained about tenders, 304.
 respecting amount promised to Ohapleau, 305.
 history of this arrangement, 306.

SHIELDS, J.

of the firm of Manning & Co., 307.
 arrangements with Fraser, Grant & Co., also with P. G. Close, 307—313.
 witness's withdrawal from the firm, with substitution of his father, 313.

MANNING, A.

became interested with Fraser, Grant & Pitblado, 496.
 did not become interested with them until after they got the contract, 497.
 merely entered into it to help other people, 497.
 took very little part in the negotiations, 497.
 a matter of indifference to witness, 497.
 no recollection of Fraser & Co.'s letter of 29th February, addressed to Minister of Public Works, suggesting an amalgamation, 499.

CHAPLEAU, S. E.—St. O.

practice of Department, 850.
 transaction with McDonald, 852.
 with Smith, 853.
 use of patent, 855
See Chapleau; Influencing Clerks.

SMITH, J. N.

carries on business in New York, 938.
 visited Ottawa as intending surety, 938.
 subsequent negotiations with Andrews, Jones & Co. as to partnership, 939
 their promise to put up security without proper foundation, 941.
 does not remember Chapleau's arrangement as to telegraphing, 942.
 moneyed men at witness's back refused to entertain the project, 942
 refusal chiefly due to imminent breaking up of winter, 943.
 relations with Ohapleau, 947.
 never any talk as to Ohapleau's partnership, 948.

GOODWIN, J.

tendered unsuccessfully for sections A and B, 1005.
 negotiations with Andrews, Jones & Co., 1006.
 finally declined to join them, 1008.

HAGGART, J., M.P.

made enquiry as to alleged waste in passing over Andrews, Jones & Co., 1016.
 gives explanation offered to him, which he deemed satisfactory, 1016.

CONTRACT No. 42.—Railway construction—continued.**TENDERING—continued.****MORSE, G. D.**

witness's firm tendered for A and B separately, and collectively under C, 1048.
 B awarded, 1049.
 withdrew from offer, 1049.
 negotiations with Close and Shields, 1051.
 lowest separate tenders less than their combined tender, 1052.
 proposition to join next highest tender, 1053.
 agreement made before withdrawing, 1054.
 evidence as to deposits, 1055
 not all put up within the time, 1056.
 negotiations with F. Shanly, 1057.
 March 5th, notified contract awarded to Fraser, 1058.
 negotiations with Close, 1060.

MARPOLE, R.

of Morse, Nicholson & Marpole, 1063.
 other partners interested, 1063.
 negotiations with Close and Shields, 1064.
 tendered for sections B and C, 1065.
 tender for B not conditional, 1066.
 relative position of tenders known, 1066.
 known immediately after tenders in, 1067.
 believes that Shields had no advantage over others as to information, 1071.
 witness disagreed with partners as to prices, 1072.
 Shields advised lower prices, 1072.
 Fleming and Smith said prices too low, 1073.
 before declining contract arranged with next highest tender, 1074.
 when Jones and Smith left Ottawa expected they would put up security, 1075.
 not aware that Smith's decision depended on others in New York, 1075.
 as to delays in putting up security, 1076.
 hardly expected extension, 1077.
 notice of contract being awarded to Fraser before entire deposit was made, 1077.
 conditional arrangements with F. Shanly, 1078.
 thinks no just complaint can be made, 1079.
 agreement with Close modified, 1084.
 Boulton not personally interested, 1084.
 not aware of any benefit to Member of Parliament or official, 1084.

McCORMICK, A.

undefined interest in Morse & Co.'s tender, 1079.
 present during negotiations with Shields and Close, 1080.
 Boulton's relations thereto, 1080.
 informed Minister that only the combined sections would be accepted, 1082.
 reasons why notification not given in writing, 1083.

NICHOLSON, F.

of Morse & Co., 1085.
 made no tender for A separately, 1085.
 tender for section B wholly unconditional, 1086.
 notified 20th February that section B was awarded to witness's firm, 1087.
 declined contract, 1087.
 agreement with Andrews, Jones & Co. produced, 1088.
 communicated substance of arrangement to Minister, but withheld certain information, 1090.
 difference between witness's tender and that of Andrews, Jones & Co., \$448,436, 1091.
 neither Smith nor Jones in Ottawa, between 26th February and 5th March, 1091.
 witness's letter respecting security, dated 5th March, not correct, 1092.
 agreement with Close and Shields produced, 1093.
 led to believe that they could obtain contract, though not the lowest tenderers; consideration mentioned in agreement not the real one, 1095.
 Close signed and acted for himself and Shields jointly, 1095.
 negotiations leading to modification of agreement with Close, 1096.
 heard Chapleau's name mentioned as possible participant, 1099.

CONTRACT No. 42.—Railway construction—*continued.*
TENDERING—*continued.***NICHOLSON, F.—*continued.***

original figures in tender B reduced at Shields' suggestion, 1099.
 witness lost all faith in Shields's influence or reliability, 1100.
 capacity in which Macdougall acted, 1101.
 witness's firm never offered to sell or received any money, 1102.
 telegraphic correspondence respecting Andrews, Jones & Co.'s refusal to proceed, 1298.
 telegraphic correspondence as to security, 1299.
 second \$100,000 not deposited when contract awarded to Fraser, 1301.

CLOSE, P. G.

retired from the grocery business, 1160.
 in January, 1879, Morse asked witness to become surety, 1160.
 Morse wanted a surety known to Government, 1160.
 compensation, a commission on tender, 1161.
 reasons why witness's name strengthened tender, 1162.
 witness never undertook to secure any improper advantage for Morse, 1162.
 made no effort to influence Government, 1163.
 knows nothing of any message sent by McCormick, 1165.
 Shields negotiated all arrangements, 1165.
 after Morse & Co. were out, arranged for interest in section B with Manning, 1166.
 no arrangement with them till 6th March, 1166.
 had discussed matters with Shields before withdrawing from Andrews, Jones & Co., 1167.
 final interview with Morse, 1168.
 agreement with Shields stipulates witness shall not be surety for Morse, 1169.
 reasons for this proviso, 1169.
 no negotiation with any Minister in reference to contracts A, B, or C, 1170.

TUPPER, SIR CHARLES.

deliberations as to advisability of asking for tenders separately or together, 1261.
 no step taken without consulting colleagues, 1262.
 tenders for C slightly in excess of A and B, 1262.
 would, however, have been considered if from a firm of sufficient strength, 1263.
 Chief Engineer would not recommend Morse & Co. for whole work, 1263.
 tenders for separate sections adopted, 1264.
 no intimation of Morse & Co.'s intended withdrawal, until their letter declining contract received, 1265, 1273.
 winter passing rendered disposal of tenders urgent, 1265.
 Fleming reported loss of a week might mean a whole year, 1265.
 passed to next tender, 1265.
 time for Andrews, Jones & Co. to qualify fixed at three days, 1266.
 short time justified by their letter of 6th February, 1266.
 no knowledge of arrangement of Morse & Co. with Shields and Close, 1268.
 Manning's probable association with Fraser known before contract awarded, 1268.
 practically Andrews, Jones & Co. had eight days to deposit, 1269.
 approved of Andrews, Jones & Co. strengthening the firm through Goodwin, 1269.
 Thompson's deposit not available as against Andrews, Jones & Co., 1270.
 believes no one improperly benefitted by letting contract to Fraser & Co., 1271.
 when negotiating as to deposits never suspected Andrews, Jones & Co. had retired, 1273.
 no contingent promises to any tenderers, 1273.
 long period tenders adopted after careful consideration, 1273.
 argument as to further delays in passing Andrews, Jones & Co., 1274.

MACDONALD, HON. J.

no improper influence, 1293.

CONTRACT No. 42.—Railway construction—continued.**TENDERING—continued.****POPE, HON. J. H.**

transfer from Fraser to Manning made during witness's temporary administration, 1302.

security not weakened thereby, 1303.

FLEMING, S.

Morse, Nicholson & Marpole lowest for sections 41 and 42 combined, 1404.

lowest for section 42, 1404.

lower than next tenderer by \$700,000, 1406.

witness recommended acceptance of other than lowest tenders, 1405.

recommendation not adopted, 1405, 1408.

advised against giving Morse & Co. the whole work, 1407.

satisfied they could not carry it on, 1408.

did not believe they could do work on contract 42 for price in tender, 1409.

recommended Fraser, Grant & Co., 1409.

tenderers were allowed to take position according to their rights, 1410.

information to tenderers as to muskegs, 1413.

open question as to whether muskeg should be used in embankments, 1414.

knew Fraser and Pitblado and formed a high opinion of them as contractors, 1415.

no recollection of any pressure in favour of his recommendation of them, 1415.

time of great importance, 1416.

ENGINEERING—**MANNING, A.**

difficulties encountered, character of country, cost of moving supplies, 502.

fifteen hundred men employed, 503.

immense fills, 503.

witness's information derived from others he not having been on the ground, 503.

JENNINGS, W. T.

as to economy made on the line in this section, 793.

TUPPER, SIR CHARLES.

estimates based with greater accuracy than heretofore, 1272.

reduction effected by re-location, 1272.

SCHREIBER, O.

inspected this contract December, 1879, 1767.

general location settled, 1767.

made slight deviations, 1767.

saved thereby \$600,000 to \$700,000, 1768.

found work progressing satisfactorily except as to time, 1768.

thinks a total saving of \$1,500,000 has been made on contract 42, 1768.

of which \$650,000 is absolutely saved and \$850,000 the result of modified design, 1769.

See *Engineering*; *Influencing Clerks*.**CONTRACT No. 43.—Operating Pembina Branch:****TRUDEAU, T.**

lease for operating Pembina Branch cancelled by Order-in-Council, 28th January, 1890, 89, 1087.

no public competition, 1047.

first document recorded, an offer from Upper, 1047.

reported on by Fleming 3rd March, 1879, 1047.

authorized by Order-in-Council, 13th March, 1879, 1047.

claim of contractors under consideration, 1048.

CONTRACTS Nos. 44 TO 47.—Steel rails, &c.:**TRUDEAU, T.**

competition invited by letter, 959.

time for delivery 15th August, 1879, 959.

ordered through Reynolds as agent, 960.

method of inviting competition discussed between Engineer and Minister, 960.

CONTRACTS NOS. 44 TO 47.—Steel Rails, &c.—*continued.*

TUPPER, SIR CHARLES.

course pursued as to purchase of rails, 1275.

FLEMING, S.

how contracts Nos. 44 to 46 came to be made, price £4,193. to £5 delivered in Montreal, 1419.

report of 17th June, 1879, showing necessity for rails, 1419.
Reynolds's arrangements satisfactory, 1419.

CONTRACT No. 48.—Railway construction :

TENDERING—

TRUDEAU, T.

let by public competition after advertisement, 82.

tenders received to 1st August, 1879, 82.

lowest tenderer, Hall, 83.

Hall not prepared to deposit, himself doubtful about finding capital, 84.

Hall retires; his deposit returned, 85.

under Order-in-Council, 86.

Ryan's tender \$46,190 more than Hall's, 85.

tenders produced, 868.

RYAN, J.

contractor for first 100 miles west of Winnipeg, 476.

Hall a lower tenderer than witness, 476.

knew nothing of relative positions of tenders till contract was let, 477.

no negotiations with other tenderers, 477.

HAGGART, J., M. P.

no interest with Ryan, or any other Government contractor, 1017.

POPE, HON. J. H.

tender awarded on witness's recommendation, 1302.

Hall declined contract; prices too low, 1302.

FLEMING, S.

Smellie reported against Hall, 1420.

Hall's letter of withdrawal produced, 1420.

SMELLIE, W. B.

reasons for reporting against Hall, 1421.

Hall did not express any dissatisfaction, 1422.

ENGINEERING—

TRUDEAU, T.

some fault found as to progress made; reasons of delay under investigation, 87.

RYAN, J.

contract let August, 1879, 477.

half to be finished in eight months, the whole by 19th August, 1880, 477.

some delay in location, 478.

bulk price \$600,000, without fencing and with half ballast, 478.

change in the mode of building, 479.

track located only from twenty to forty miles ahead of track-layers, 479.

ties laid on the prairie, and ballast put in instead of earth excavation, 479.

process approved by Schreiber, 479.

road-bed improved and cost not materially increased, 480.

correspondence with Department relative to this change, 480.

rate of progress five miles a week, 481.

seven stations on line, 481.

ROWAN, J. H.

delays in locating were due to extreme wetness of season, 750.

contractor claims that ballasting is more costly than grading, 750.

witness prefers to offer no opinion thereon, 751.

Drope's discharge authorized by Schreiber, 811.

witness's relations with Murdoch, 822-823.

MURDOCH, W.

in June, 1879, locating contract 48, 805.

size of party twenty-two, 805.

completed 1st September, 806.

witness removed to take charge of contract 66, 806.

as to Drope's inspection of ties, 808.

certain instructions by Chief Engineer disapproved by witness, but notwithstanding carried out, 817.

censured by Chief Engineer for doing so, 818.

respecting his treatment by Rowan, 818.

CONTRACT No. 48.—Railway construction—continued.**ENGINEERING—continued.**

- DROPE, T.**
complaint as to his discharge, 810.
- FLEMING, S.**
respecting delay in location of the line, 1423.
Ryan urged to proceed at once, 1423.
temporary right of way granted by city of Winnipeg, 1424.
thinks line was located faster than Ryan could proceed, 1425.
surveys not required for this section, country being flat, 1425.
rails laid on ground and then ballasted, 1426.

CONTRACT No. 49.—Station buildings :

- TRUDEAU, T.**
submitted to public competition, and contract awarded to lowest tender, 59.
cost limited to a maximum sum, in contract, 59.
completed to satisfaction of Department, 60.

CONTRACT No. 50.—Railway spikes :

- TRUDEAU, T.**
public competition ; lowest tender accepted, 975.
delivery satisfactory, 976.

CONTRACT No. 51.—Fish-plates, bolts, &c :

- TRUDEAU, T.**
contract based on lowest tender after competition, 976.
articles supplied of Canadian manufacture, 976.
delivery satisfactory, 976.

CONTRACT No. 52.—Transportation of rails :

- TRUDEAU, T.**
competition invited by circular, 992.
Beatty had previously tendered, 992.
let to the lowest offer, 992.
- FLEMING, S.**
suggested inviting tenders by circular, 1427.
lowest tender accepted, 1427.

CONTRACTS Nos. 53 to 55.—Steel rails :

- TRUDEAU, T.**
public competition invited by advertisement, 997.
procured from lowest available tenderers, 997.
Order-in-Council 13th June, 1879, authorizing purchase, passed on Chief Engineer's report, 997.
prices, £4 15s. to £5 5s., 998.
history of negotiations, 999.
- REYNOLDS, T.**
Fleming telegraphed in 1879, authorizing witness to receive tenders, 1003.
mode of inviting competition, 1004.
lowest offer accepted, 1004.
- TUPPER, SIR CHARLES**
course pursued as to purchase of rails, 1275.
colleagues and Chief Engineer in accord, 1276.
all purchased from lowest available tenderers, 1277.
no benefit accrued to any Member of Parliament or other person than contractors, 1277.
- FLEMING, S.**
pressed on Minister necessity for rails, 1428.
advertised in English papers, 1428.
tenders opened by Finance Minister in presence of Sir J. Rose and witness, 1428.
50,000 tons ordered, of which 11,000 were for Intercolonial (Rivière du Loup), 1429.
respecting Wallace's tender, 1430.
lowest tenders invariably accepted, to full extent parties would furnish, 431.

CONTRACT No. 56.—Iron bridge: /

- TRUDEAU, T.**
 amount of contract, \$1,400, 996.
 let to lowest tenderer after competition, 996.
 recommended by Fleming's report, 24th November, 1879, 996.
 work not yet complete, 996.
- FLEMING, S.**
 lowest tender accepted, 1432.
 satisfactorily erected, 1432.

CONTRACT No. 57.—Railway frogs, &c. :

- TRUDEAU, T.**
 no competition, patent having been adopted, 996.
 recommended 11th November, 1879, by Chief Engineer, 996.
 Order-in-Council confirming, 996.
 cost \$12,000, contract fulfilled, 997.
- FLEMING, S.**
 frogs previously got from the Kingston Penitentiary, 1432.
 offered by the Truro company at a lower rate, 1432.
 a better article for a less price, 1433.
 no influence to prevent public competition, 1433.

CONTRACT No. 58.—Iron turn-tables :

- TRUDEAU, T.**
 tenders invited by circular, 1151.
 contract let to lowest tenderer, 1154.
- FLEMING, S.**
 tenders invited by circular, 1433.
 the lowest offer accepted, 1434.
 advertising would have been too expensive, 1434.

CONTRACT No. 59.—Railway ties :

- RUTTAN, H. N.**
 Whitehead, Ryan and witness contracted to deliver 100,000 ties in
 the spring of 1850, 35.
 difficulties with Rowan as to culling, 35.
- TRUDEAU, T.**
 contract has been fulfilled, 87.
- RYAN, J.**
 witness a partner in contracting firm, 482.
- FLEMING, S.**
 instructed Rowan to receive tenders; the lowest accepted, 1435.

CONTRACT No. 60.—Railway construction :**TENDERING—**

- MACDONALD, A. P.**
 lowest tenderer on sections A and C, 982.
 contract transferred to Onderdonk for a consideration, 982.
 one contractor having the four sections would have an advantage of
 15 or 20 per cent. over several, 983.
- McRAN, W.**
 interested with A. P. Macdonald and others, 1067.
 tenders made out at the Windsor Hotel, Montreal, 1068.
 assigned to Onderdonk, 1068.
 Onderdonk's view of the transaction, 1069.
 the concentration of work an advantage to contractor, 1069.
- TRUDEAU, T.**
 public competition invited by advertisement, 1154.
 Fleming's report of 22nd November, 1879, produced, 1155.
 witness narrates circumstances attending the opening of tenders,
 1155.
 refers to certain irregular tenders, 1155.
 Order-in-Council of 22nd December, 1879, authorizing transfer to
 Onderdonk, produced, 1158.
 witness thinks it better that large works should be placed with one
 contractor if feasible, 1158.

CONTRACT No. 60.—Railway construction—*continued.*
TENDERING—*continued.***TUPPER, SIR CHARLES.**

reasons for inviting British Columbia tenders separately and subsequent amalgamation, 1287.

Onderdonk how and when introduced, 1289.

nature of the syndicate represented by D. O. Mills, 1289.

MILLS, D. O.

tenders of Onderdonk authorized by syndicate, 1297.

no preconceived arrangement with other tenderers, 1297.

Government security improved by transfer, 1298.

FLEMING, S.

on receiving report from Edmonton respecting Peace River route, an Order-in-Council was passed adopting Burrard Inlet and tenders for sections 60 to 63 invited, 1436.

D. McDonald & Co's tender, the lowest, was accepted, 1437.

CONSTRUCTION—**MILLS, D. O.**

one of the syndicate, 1296.

work progressing as demanded by contract, 1296.

how syndicate became interested, 1297.

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See *Engineering.*

CONTRACT No. 61.—Railway construction :**SMITH, J. N.**

was interested with others in this tender, 952.

sold his third interest to Onderdonk for \$31,500, 953.

aware of no improper influences, 954.

expected to get all sections, 954.

better for all that they should be in the same hands, 955.

saving in labour, 955.

economy in machinery, 955.

opinion based on thirty years experience, 955.

Macdougall interested only professionally, 955.

GOODWIN, J.

tendered for sections A, B, C and D, 1008.

lowest tender on B, 1009.

in company with Purcell, Ryan and others, 1009.

contract awarded and sold to Onderdonk, 1009.

witness's firm received \$100,000, 1009.

delay in acknowledging Onderdonk, 1010.

advantage of concentrating work in single management, 1011.

no intention of selling out when tendering, 1209.

TRUDEAU, T.

public competition invited, 1204.

tenders opened 20th November, 1879, 1204.

lowest tender accepted, 1205.

transferred to Onderdonk, 10th February, 1880, 1205.

RYAN, H.

interested in section B with Purcell and others, 1235.

no understanding with Onderdonk prior to award, 1235.

Government refused to allow transfer before contract, 1236.

a voluntary transfer, 1237.

reasons for acquiescence, 1237.

no improper information or advantage, 1238.

one contractor more economical than many, 1238.

special necessity for centralization, 1238.

FLEMING, S.

contract based on lowest tender, 1438.

See *Engineering.*

CONTRACT No. 62.—Railway construction :**TRUDEAU, T.**

contract awarded to lowest regular tenderer, 1207.

contracts 60 to 63 inclusive, transferred to a syndicate by Order-in-Council, 1207.

FLEMING, S.

given to lowest tenderer, 1439.

took no part in transfer to Onderdonk, 1439.

See *Engineering.*

CONTRACT No. 63.—Railway construction :

- KAVANAGH, T.**
tendered for section D, 838.
transferred to Onderdonk, 839.
does not remember anything about it, 839.
further as to what he does not remember, 840.
- KAVANAGH, J.**
tendered for section D, 1018.
no knowledge how figures were made up, 1019.
sold to Onderdonk, 1020.
witness sole negotiator with Onderdonk, 1020.
no experience in contracting, 1021.
- TRUDEAU, T.**
awarded to Kavanagh the lowest tenderer, 1208.
respecting extension of time approved by Order-in-Council, 1208.
- TUPPER, SIR CHARLES.**
why time granted to Kavanagh, 1290.
distinction between this matter and Andrews, Jones & Co., 1291.
Department sustained in this extension by Order-in-Council, 1292.
- FLEMING, S.**
contract let to the lowest of eleven tenderers, 1439.
took no part in transfer, 1439.
results of the transfer favourable to the public, 1440.
better for the public that one strong firm should have the whole work,
1441.
work let at very low prices, 1441.
See *Engineering*.

CONTRACT No. 64.—Bridge over Red River :

- RYAN, J.**
sum involved, \$7,350, 481.
duly completed and paid for, 481.
- TRUDEAU, T.**
public competition invited, 1209.
contract let to lowest tenderer, 1210.
work completed, 1210.
- FLEMING, S.**
how the work was undertaken, 1441.
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CONTRACT No. 65.—First-class passenger cars :

- TRUDRAU, T.**
public competition invited, 1210.
lowest tender accepted, 1210.
- FLEMING, S.**
contract given to lowest tenderer, 1442.

CONTRACT No. 66.—Railway construction :**TENDERING—**

- TRUDRAU, T.**
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contract let to lowest tenderer, 87.
- MCTAVISH, G. L., 488.**
contract signed in absence of witness, 487.
to be completed 31st December, 1881, 487.
the non-completion of the first 100 miles a serious drawback, 488.
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- CHAPLEAU, S. E. St. O.**
never assisted Bowie, 860.
- BOWIE, A.**
tendered with others for this contract, 1144.
difference of opinion as to prices, 1145.
general conversations with Chapleau, 1146.
prices of Geo. Bowie's tender diminished about \$9,000 or \$10,000, 1147.
Nicholson & Marpole's tender about \$10,000 higher than witness, 1147.
effect of changes to make tender \$289 lower than Marpole's, 1148.
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witness sold out to Bowie & McTavish, 1148.
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CONTRACT No. 66.—Railway construction—continued.**TENDERING—continued.****TRUDEAU, T.**

Engineer's report on tenders produced, 1212.
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FLEMING, S.

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location not approved by witness; gives his reasons, 1443.

ENGINEERING—**MURDOCK, W.**

in charge of location, 814.
party: twenty-one, 814.
ready for contractors 9th July, 815.
found favourable line, 815.
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CONTRACT No. 67.—Box and platform cars:**TRUDEAU, T.**

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Simon Peters \$5 lower for box cars, but could not furnish quantity required and withdrew, 1211.
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FLEMING, S.

confirms Trudeau's evidence, 1444.

CONTRACT No. 68.—Postal and baggage cars:**TRUDEAU, T.**

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FLEMING, S.

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CONTRACT No. 69.—Transportation of rails:**TRUDEAU, T.**

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FLEMING, S.

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CONTRACT No. 70.—Transportation of rails:**TRUDEAU, T.**

public competition invited, 1212.
let to lowest tenderer, Henry Beatty, 1212.
prices compared with contract No. 34, 1213.

FLEMING, S.

witness had nothing to do with this, 1445.

CONTRACT No. 71.—Iron bridge:**TRUDEAU, T.**

let to lowest tenderer, 1214.

FLEMING, S.

confirms Trudeau's evidence, 1445.

CONTRACTS Nos. 72 TO 76.—**TRUDEAU, T.**

advertised and let since date of Commission, 1214.

CONTRACT No. 77.—Wire fencing:**TRUDEAU, T.**

report of tenders produced, 1214.

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COOPER, FAIRMAN & Co.:

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COOPER, JAMES:

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 contract No. 8, 915.
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CROSSING RED RIVER:

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DEPARTMENT OF RAILWAYS AND CANALS:

TRUDEAU, T.

Deputy Minister, 1.
 connection with Canadian Pacific Railway since commencement, 1.
 next in control to Minister, 1.
 Pacific staff special and distinct as to engineering, not as to accounting, 1.
 accountant: James Bain, 2.
 accounts by double entry, 2.
 no periodical report by accountant to Deputy, 2.
 Fleming financially responsible from inception till 1875, 2.
 subsequently system changed, 2.
 Fleming's paymasters: Wm. Wallace, Geo. Watt, and subsequently Radford, 2.
 Watt's accounts were audited by T. Taylor, and reported satisfactory, except as to vouchers, 2.
 all orders should proceed from Minister, 3.
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FLEMING, S.

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- BRAUN, F.**
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- SCHREIBER, C.**
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ENGINEERING:

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- FLEMING, S.**
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- instrumental surveys decided on, 1639.
- advantages of a traversed line, 1639.
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- letter to Minister (1871) as to winter surveys, 1641.
- progress of work described in report of 1872, 1642.
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- system adopted due to witness's belief that the railway was to be commenced within two years, 1646.
- otherwise would have made explorations first, 1646, 1649.
- practicable line from end to end required before a blow was struck, 1650.
- probable expense of exploring parties, 1652.
- two engineers, two axe men and men for transport sufficient for an exploration, 1653.
- refers to Murdoch, Armstrong and Austin's exploratory surveys, expense of which could be obtained from Department, 1653.
- cost of instrumental as against exploratory not considered, 1658.
- the latter impracticable, 1658.
- sufficiently capable men for the latter not available, 1658.
- exploratory not sufficient in any case, 1660.
- instrumental between Lake Superior and Ottawa essential; reason why, 1660.
- exploration parties used on branch lines from an instrumental base, 1662.
- impossible for a non-professional man to ascertain feasibility of railway, 1662.
- breadth of country examined, 1663.
- course followed in making instrumental survey, 1663.
- cost of surveys a secondary consideration, 1664.
- up to 1877, 10,000 miles of track surveys between Ottawa and Red River, 1664.
- attention first drawn to Howse and Yellow Head Passes by writings of Capt. Palliser and others, 1666.
- appointments on political grounds, 1666.
- directions to district engineer, 1667.
- much left to men's discretion, 1668.
- instruction to Moberly as to Howse Pass, 1668.
- comparison of Yellow Head and Howse Passes, 1670.
- abandonment of Howse Pass, 1670.
- reasons in favour of Yellow Head Pass, 1671.
- difficult approach to Howse Pass, 1671.
- supplies: directions to utilize Moberly's, 1674.
- exorbitant purchases by Moberly, 1678.
- lost, 1678.
- unnecessary articles purchased, 1678.
- Moberly's explanation as to, 1681.
- telegrams to and from Trutch respecting Moberly's change of base, 1674.
- Yellow Head Pass decided upon without an instrumental survey, 1675.
- enormous sums expended on surveys in British Columbia, 1676.
- trans-continental journey in 1872, 1678.
- dissatisfaction with Moberly, 1679.
- instructs him as to Jasper Valley survey, 1679.
- his services discontinued, 1682.
- correspondence between Fleming and Smith in 1872 produced, 1683.
- in England nineteen months in three years, 1683.

SMITH, M.

- arrived in British Columbia (1872), 1503.
- remained in charge until 1876, 1504.
- next superior officer: Cambie, 1505.
- made explorations from Winnipeg westward (1877), 1505.
- examined route critically from Edmonton, 1506.

ENGINEERING—continued.**SURVEYS—continued.****GENERAL—continued.****SMITH, M.—continued.**

- visited contracts 13, 14, 15 and 25 under construction (1878), 1507.
 sections 41 and 42 under survey (1878), 1507.
 wanted to resume work in British Columbia (1879), 1507.
 informed that little would be done there, 1507.
 proceeded to Manitoba, 1508.
 line south of Lake Manitoba explored, 1508.
 same work in 1880, 1509.
 each season's work in British Columbia arranged by Chief Engineer, 1509.
 manner of surveys, Fleming responsible for, 1510.
 Howse Pass abandoned before he went out, 1510.
 examined Watt's accounts in 1872, 1511.
 only two parties engaged in British Columbia in 1873, 1512.
 under Jarvis and Gamsby, 1512.
 object to obtain route through Cascade range, 1513.
 instructions for season 1872-73, 1513.
 impossibility of reducing expenses on account of system already established, 1514.
 exploring parties would have been sufficient, 1514.
 stated so in letter of 14th June, 1872, 1514.
 refers to the Palliser expedition, 1514.
 Palliser failed to find Yellow Head Pass his field being restricted by instructions, 1515.
 thinks Fleming must have been assured of the practicability of Howse Pass, 1517.
 time pressure in a measure justified instrumental survey, 1517.
 would have started smaller parties, 1518.
 two engineers and Indians a sufficient exploratory staff, 1560.
 comparative merits of passes should have been ascertained before directing instrumental survey, 1561.
 respecting McLennan's parties, 1562.
 ninety animals lost, 1562.
 Mahood's party badly managed, 1562.
 fire in C.P.R. buildings destroyed all the work of 1872, 1563.
 left Ottawa 15th May, 1874, with three parties, 1564.
 Bute Inlet then a probable terminus, 1564.
 Horetzky found a good pass through Kitimat Valley to the Skeena, 1566.
 Cooper's report of no value, 1566.
 surveys of 1875 also directed to Bute Inlet, 1567.
 survey on the Homathco, 1568.
 re-survey from Yellow Head Pass to Fort George, 1568.
 thinks British Columbia surveys 1873—1875 judicious and economical, 1568.
 explorations finished in 1874, 1569.
 spring of 1876, Chief Engineer being absent, was made acting Chief Engineer, 1569.
 Cambie sent out in his place to British Columbia, 1569.
 reasons why Howse Pass abandoned, 1582.
 no pass through Selkirk range, 1582.
 Moberly's instructions to retire from Howse Pass direct from Fleming, 1583.
 Chief Engineer's instructions respecting Athabaska Pass a mistake, 1584.
 engineers should not be trammelled by detailed instructions, 1584.
 further as to French River survey in 1876, 1585.
 between Nipissing and Nipigon the initial steps should have been bare explorations, 1587.
 first letter after appointment advocated exploratory surveys, 1597.
 examined country west of Winnipeg, 1591.
 made trial location south of Lake Manitoba, 1591.
 crossing good on Little Saskatchewan, 1591.
 not on Assiniboine, 1591.
 examined country south of Saskatchewan, 1592.
 thence to Carleton, 1592.
 wheat belt extends into forest country, 1592.
 proceeded *via* Edmonton and Yellow Head Pass to Kamloops, 1592.
 thence to New Westminster, 1593.

ENGINEERING—continued.*SURVEYS—continued.***GENERAL—continued.****SMITH, M.—continued.**

examined progress of British Columbia surveys, 1593.
 returned by way of San Francisco, 1593.
 visited section 14, 1593.
 returned to Ottawa in November, 1593.
 attention not called to Cross Lake, 1593.
 wrote appendix D to report of 1878, 1594.
 map suppressed, 1594.
 Fleming telegraphed for to write report, 1594.
 recommended Pine River Pass to Bute Inlet, 1594.
 Minister differed, 1595.
 ignored from spring of 1878, 1595.
 no instructions left in spring of 1878 when Fleming went to England, 1596.
 no consultation, 1596.
 thought Yellow Head Pass altogether wrong, 1596.
 reference to Pine River Pass explorations, 1598.
 favourable report by Hunter, 1598.
 report as to character of country, 1599.
 questions other than engineering weighed with him in recommending change of route, 1599—1602.
 extent of information gained by surveys, 1602.
 bringing parties to Ottawa an unnecessary expense, 1602.
 causing loss of time in spring, 1603.
 private company would have proceeded more rapidly, 1603.
 in charge of two parties in spring of 1879, 1611.
 locating 200 miles west Winnipeg, 1612.
 description of lines, 1612.
 kept ahead of contractors, 1612.
 first-class line located, 1613.
 report in favour of Stone Fort as crossing, 1613.
 addressed to Chief Engineer, 1614.
 did not appear in print, 1614.

MACKENZIE, HON. A.

took charge in 1873, 1784.
 Government not in possession of opinions from engineers justifying decided action, 1784.
 route from Upper Thompson to Big Bend discovered in 1874 to be impracticable, 1785.
 Fleming the sole director of surveys, 1785.
 view as to testimony regarding Government policy, 1785.
 Fleming not directed to change method of survey, 1785.
 locations made up to the end of 1874, 1786.
 general direction pretty well decided as far as Yellow Head Pass when telegraph tenders were invited, 1786.
 policy of Government to obtain shortest line between Thunder Bay and Rat Portage, 1805.
 decision to construct immediately, 1805.
 original line from Nipigon *via* Sturgeon River exceedingly rough, 1805.
 thinks quantities were not ascertained before contract was let, 1805.
 understands quantities calculated from actual data, so engineers reported, 1806.
 selection of Selkirk left to engineer, 1807.

EXPLORATORY.**RUTTAN, H. N.**

civil engineer and contractor, 21.
 assistant to T. J. Thompson at Pic River, 21.
 party: twelve, 21.
 from Red Rock to South Bay of Nipigon (instrumental), 22.
 four months in the field, 22.
 supplies: Thompson responsible for, 22.
 at Ottawa after field work, 22.
 from Hay Lakes to Root River (1875), 23.
 party: twenty-five to thirty-five, 23.

ENGINEERING—continued.**SURVEYS—continued.****EXPLORATORY—continued.****CARRÉ, H.**

- from height of land to English River (1871), 121.
- party: thirty-three, 122.
- surveys in charge of Rowan, 122.
- nature of work, country unknown, 123.
- latitude taken from stars, 123.
- supplies: difficulty about, 121.
- got from Thunder Bay, 122.
- started with sufficient for a month, 123.
- ran out a week after reaching starting point, 123.
- considered Rowan to blame for inadequacy, 123.
- work stopped in consequence, 125.
- returned to Thunder Bay, 15th October, 125.
- time lost from middle of October to end of December, 126.
- men on pay, 126.
- money value lost \$3,840 exclusive of provisions, 127.
- attacked with scurvy and had to return to Thunder Bay, 127.
- from Red Rock to north end of Black Sturgeon Lake (1873), 127.
- party: thirty-three, 127.
- supplies: ascertained before leaving that they were adequate, 128.
- finished in October, 1873, 128.
- in Ottawa until the spring, 128.
- from North-East Bay to Sturgeon Falls (1875), 131.
- returned to Ottawa March, 1875, 131.
- scheduled out quantities which were enormous, 131.
- asked to find a better route, 131.
- returned for that purpose, June, 1875, 131.
- survey exploratory and location combined, 131.
- line finished in December, 1875, 131.
- party: about fifty, 131.
- ran Dalles line at same time, 132.
- returned to Ottawa and remained until May or June, 1876, 132.

JARVIS, E. W.

- employed from 1871 to 1875, 274.
- from White Fish Bay to Red River (1871), 274.
- party: thirty-two, 275.
- ordered to remain out during winter, 276.
- supplies: base of, Thunder Bay, 275.
- four hundred miles from commencement of work, 275.
- sent Gray to Winnipeg to purchase, 275.
- those sent *via* Thunder Bay nearly consumed by supply party, 276.
- reached Red River 30th March, 1872, 277.
- struck river about ten miles north of Winnipeg, 277.
- cross-sectioned portions of the line, 278.
- returned to Ottawa and made plans, 278.
- plans and data burnt in fire of railway offices, 278.
- could not have been used to ascertain quantities, 278.
- line would have escaped Julius Muskeg, going south of it, 279.
- from Eagle Lake to Sturgeon Lake (1872), 280.
- time occupied: June to October, 280.
- supplies: manner of procuring, 280.
- difficulty in transporting, 281.
- six months outfit from \$10,000 to \$12,000, 282.
- in Ottawa during winter, 283.
- from Eagle Lake to Rat Portage (1873), 283.
- party: twenty, 283.
- cost of, much less, 284.
- supplies: arrangements with regard to, 283.
- took nothing but pemmican and flour, 284.
- laid down centre line and cross-sectioned at certain points, 284.
- data sent to Ottawa, 284.
- in June, 1873, proceeded to British Columbia, 285.
- from Cache Creek south-westerly to the Cascade Range, *via* Lillooet to Seton Lake, then north-westerly from Cache Creek to the Thompson *via* Bonaparte Valley, 285.
- party: twenty-four and mule train, pack train and thirty mules, 285.
- animals already the property of the Government, 285.

ENGINEERING—continued.**SURVEYS—continued.****EXPLORATORY—continued.****JARVIS, E. W.—continued.**

from Bridge Creek, Fraser River, to Horse Fly Lakes, 287.
 party: three, 287.
 thinks three men, with engineer in charge, and half a dozen animals sufficient for an exploration in British Columbia, 287.
 returned to Ottawa winter of 1873-74, 287.
 returned to British Columbia with three assistants in 1874, 288.
 from Tête Jaune Cache to Fraser River, 288.
 party: thirty-three and one hundred and twenty animals, 288.
 supplies taken with them, 288.
 engaged from June to October, 288.
 none of witness's surveys in British Columbia on located line, 289.
 north of Tête Jaune Cache and Smoky River Pass, 289.
 organizes party, 289.
 nearly starved to death, 289.
 reached Edmonton end of March, 1875, 290.
 Winnipeg, 23rd May, 290.
 declined further Government service, 290.
 cost of exploring in British Columbia and Lake Superior about the same per mile, prairie region cheaper, 293.

FORREKT, H. F.

assistant leveller on Mahood's party R, 345.
 from North Thompson towards Chilcotin, 345.
 description of, 346.
 commenced operations in May, 1872, 346.
 party: thirty, and sixteen mules and eighteen pack horses, 346.
 supplies: R. McLellan responsible for, 347.
 engaged until November, 347.
 on plans in Ottawa during winter, 349.
 probably forty miles covered by surveys, 347.
 line practicable but not favourable, 348.
 joined Carre's party, 1873, 348.
 from Nipigon River to Sturgeon Lake, 348.
 supply: system of, 349.
 engaged on plans in Ottawa during winter, 349.
 from Winnipeg to Selkirk, 354.
 party: about fifteen, 354.
 finished September, 1875, 354
 present located line not on these surveys, 354.

MOBERLY, W.

in charge of parties S and T, British Columbia, 400.
 consisted of twenty-two to twenty-four each, exclusive of packers, 401.
 party S: eighty or ninety animals in train, 401.
 afterwards bought more, 401.
 reached Wild Horse Creek, September, 1871, 403.
 to go to Howse Pass, 404.
 expense of wintering \$57,000, 407.
 instructed in 1872 to abandon Howse Pass and proceed to Yellow Head Pass, 410.
 discharged in October or November, 415.
 engaged during 1872 in cutting trail through Athabaska Pass to Yellow Head Pass, 415.
 according to telegraphic instructions from Chief Engineer, 416.
 remonstrated and recommended a different course, 417.
 endorsed by Lieut.-Governor Trutch, 417.
 an able Engineer, 418.
 loss in consequence (estimated) \$60,000, 418.
 and McCord trail party (1872-73), 419.
 consisted with party S of forty or forty-five men and two hundred and fifty animals, 419.
 reasons for so many animals, 420.
 from Kettle River to Edmonton, 420.
 found Howse Pass grades heavier than expected, 422.
 contradictory instructions, 423.
 concluded that Yellow Head Pass was preferable to Howse Pass in 1873, 424.
 wintered in 1872 near Jasper House, 424.

ENGINEERING—continued.**SURVEYS—continued.****EXPLORATORY—continued.****MOBERLY, W.—continued.****party S—continued.**

Tête Jaune Cache surveyed in 1873, 424.
 easterly to Root River, 424.
 completed about August, 424.
 then westerly to Moose Lake, 424.
 then carefully located line to Tête Jaune Cache, 424.
 returned to Victoria, 424.

party T: at Eagle Pass, 408.

consisted of twenty-two, 408.

no animals or packers, 408.

trial location from Eagle Pass to Big Eddy, 408.

engaged four months, 409.

found good railway route, 410.

delay of North Thompson trail party by action of, 413.

spent six weeks hunting for trail party, 413.

loss \$80 per day, 413.

a year lost in consequence, 414.

reached Moose Lake September 18th, 414.

misconduct of party caused loss of \$50,000 to \$60,000, 415.

supplies: arrangements for, 402.

purchased by witness, 408.

depot in Eagle Pass, 408.

difficulty in transporting, 409.

cost 80 cts. per lb., 409.

left half way on survey in charge of one Indian, 409.

has never seen them since, 410.

attempt to recover, 410.

does not know the result, 410.

loss about \$7,000, 410.

misadventure as to, 411.

transferred to Hudson Bay Co. at Lake St. Anne, 424.

animals transferred to Government Agent at Kamloops, 425.

returned to Ottawa, 425.

remained a year and a-half, 425.

accounts overhauled, 425.

leaves Government service, 426.

reported Athabaska Pass not feasible, 427.

afterwards MacLeod failed to find a pass, 427.

feasibility of Howse Pass discoverable by an engineer passing over it, 429.

instructions from Fleming verbal, 429.

elaborated and printed, 429.

smaller party might have answered, 429.

as to unnecessarily heavy survey parties in British Columbia, 431.

RYAN, J.

chain man on party K, 488.

no evidence of any moment, 488.

KIRKPATRICK, W. W.

connected with Pacific Railway since 1871, 519.

transit man under Armstrong, 519.

from Black River to Long Lake, 519.

party: forty-five, 519.

supplies: difficulties as to, 520.

progress retarded thereby, 521.

due to inefficient commissariat, 521.

track survey around end of Long Lake, 522.

party: ten men, 522.

completed early in March, 522.

returned to Ottawa, 523, 525.

left for Nipigon 1st July, 1872, 523.

from north-west of Lake Nipigon to Big Sturgeon Lake, 523.

party: thirty-five (L), 523.

supplies: difficulties as to, 524.

work less effective in consequence, 524.

preliminary with transit and level, 524.

work finished Christmas morning, 524.

returned to Ottawa, 525.

ENGINEERING—continued.**SURVEYS—continued.****EXPLORATORY—continued.****KIRKPATRICK, W. W.—continued.**

- from Lake Helen to Long Lake (spring, 1873), 525.
 - preliminary, 525.
 - party: thirty-five, 525.
 - commissariat arrangements satisfactory, 525.
- returned to Ottawa in winter, 525, 537.
- on Fire Steel River (spring, 1874), 536.
 - engaged six weeks, 537.
- from Fort Frances to Sand Island River, then to Orangoutang Lake, then Wabigoon River to Wabigoon Lake, through Manitou and back to Fort Frances (1874), 537.
 - party: fourteen, 537.
 - distance: three to four hundred miles, 537.
- from Wabigoon east and west (1875), 537.
 - party: thirty to forty, 537.
 - finished in October, 538.

ROWAN, J. H.

- appointed to Pacific Railway May, 1871, 669.
- engaged until June collecting information, 669.
- sketched outline of plan for surveys, 669.
- in June left Ottawa with thirteen parties, 669.
 - each party covered seventy-five miles, 670.
 - plan of work described, 670.
 - reasons why instrumental survey was adopted, 671.
 - necessity for large parties, 672.
 - difficulties of a bare exploration, 675.
 - season's work described, 675.
 - no line found north of Lake Superior, 676.
- second season's (1872) operations, 677.
 - from Mattawa *via* Nipissing to Sturgeon River Valley, 677.
 - new line tried for, 677.
 - around Nipigon, thence westerly to Red River, 677.
 - thorough exploration, 677.
 - instrumental, 677.
- third season (1873) further operations, 677.
 - between Red River and Nipissing, 677.
 - parties engaged: eight, 677.
- fourth season (1874), 679.
 - from Rat Portage to Red River, 679.
 - re-survey, 679.
 - also north of Lake Manitoba, 679.
 - also north of present contracts 14 and 15, 679.
 - found impracticable, 680.
 - second survey of section 15 by Carre, 680.

JENNINGS, W. T.

- in charge of party in British Columbia (1875), 753.
 - from Chilanco River to Blackwater River, 754.
 - trial location, 754.
 - party: seventeen, 753.
 - increased to twenty-five in Victoria, 754.
 - engaged from June to October, 754.
 - one hundred miles, 754.
 - supplies: as to, 754.
 - feasible location for mountainous country, 755.
- in Victoria from November until January, 755.
- returned to Ottawa, 755.
- next season's (1876) operations, 755.
 - from Dean Inlet through Salmon River Valley, 755.
 - party: double, sixty, 756.
 - location and trial line simultaneously, 756.
 - fifty-two miles, 756.
 - work finished in September, 756.
- returned to Ottawa, 757.
- in 1877 a portion of the Fraser River route, 757.
 - from Boston Bar to mouth of the Harrison, 757.
 - distance: seventy miles, 757.
 - staff engaged in Ottawa, 757.
 - axe men in Victoria, 757.

ENGINEERING—*continued.**SURVEYS—continued.*EXPLORATORY—*continued.***JENNINGS, W. T.—*continued.***

party: thirty-five, 757.
 discharged September, 1877, 758.
 favourable line, 757.
 examined Puget's Sound Harbour, 758.
 returned to Ottawa, 758.
 from Emory Bar to Boston Bar (1878), 758.
 revised survey, 758.
 ran trial line south of Kamloops Lake, 758.
 party: twenty-two, 758.

MURDOCH, W.

in charge of instrumental survey (1871), 795.
 from Sault Ste. Marie 100 miles easterly, 795.
 then French River crossing, 795.
 party: thirty, 795.
 supplies: purchase and distribution of, 795.
 when first 100 miles finished all but nine of party sent home
 796.
 returned to Ottawa February, 1872, 796.
 from Winnipeg River *via* English River to Nipigon, 797.
 despatched to find feasibility of a line, 797.
 found route impossible, 797.
 party: nine, 797.
 found an alternative line, 797.
 as far as Eagle Lake, 798.
 since been mainly adopted, 798.
 reports and plans destroyed by fire at Ottawa, 798.
 relieved Rowan from May, 798.
 he going to Ottawa, 798.
 jurisdiction extended from Lake Nipigon westerly, 799.
 from Prince Arthur's Landing to White Fish Lake (1873), 799.
 party: thirty, 799.
 instrumental and in winter, 799.
 plans destroyed by fire, 799.
 from Kaministiquia to Lake Shebandowan (1874), 800.
 two parties, 800.
 not completed that season, 800.
 superseded by Hazlewood, 800.
 discharged by Mackenzie, 800.
 demanded an investigation but was refused, 800.
 examined subsequently before Parliamentary Committee, 801.
 causes of excessive coat from White Fish Lake to Black Sturgeon
 Lake in 1873, 811.
 thinks \$146 a mile for preliminary not excessive in wet land, 814.

HOBERTZKY, C.

from Fort Garry to Rocky Mountains, 1240.
 Hay Lakes to Edmonton, 1240.
 left Winnipeg 4th August, 1871, 1240.
 south to Howse Pass, 1240.
 from Edmonton to Jasper House, 1240.
 with Chief Engineer's party in 1872, 1240.
 took usual cart road to Edmonton, 1240.
 not railway line, 1240.
 forty miles a day from Fort Garry to Edmonton, 1210.
 reconnaissance *via* Peace River, 1241.
 impracticable, 1241.
 suggested Pine River Pass, 1241.
 allusion to Peace River Pass suppressed by Fleming, 1241.
 to Pine River denounced, 1242.
 altitude of passes in Cascade range, 1243.
 expedition by Gamaby to Kitlope Valley (1876), 1243.
 respecting Kitimat Valley, 1244—1249.
 Lake Tochquonyala, 1249.
 exploration near François Lake (1875), 1251.
 Skeena and Peace Rivers (1879), 1251.
 views as to Cambie's exploration, 1251.
 disappointment as to salary, 1253.
 views endorsed by Hunter, Cambie and MacLeod as to Pine River
 1253.

ENGINEERING—*continued.*SURVEYS—*continued.*EXPLORATORY—*continued.*HORETZKY, C.—*continued.*

advocated by M. Smith, 1255.
 possible terminus at one time at Bute Inlet, *viâ* Pine Pass, 1255.
 describes Pine Pass to sea-board, 1256.
 rough country between Fort Assineboine and Lesser Slave Lake, 1257.
 reasons for preferring northern line, 1257.
 climate probably worse than Kamloops, 1259.
 approach to Peace River Pass difficult, 1702.
 availability of Pine River Pass probable, 1702.
 photographed salient features of Bute Inlet (1875), 1702.
 from Vermillion River to Lake Wenebagon (1876), 1703.
 from Pie River to French River (1877), 1703.
 examined country between the Skeena and Peace River under Cambie (1879), 1704.
 alleged unpaid claim, 1706.
 cost of Peace River examination, 1706.
 manner of exploration, 1707.
 route *viâ* Pine River, 1710.
 extravagance and waste of stores, 1712.
 explorations *vs.* instrumental, 1715.
 system of taking levels by Major Williamson, 1716.
 instruments carried by witness, 1717.
 with Moberly between Winnipeg and Rocky Mountains (1871), 1718.
 no scientific training before this (1871), 1718.
 further as to Peace and Pine River Passes, 1719.
 expedition by Gamsby to Kitlope Valley, 1721.
 missed the country explored by witness, 1722—1726.
 further as to, 1726—1730.
 cost of, 1732, 1749.
 did not cover ground surveyed by witness, 1750—1752.
 suppressed report (1874). passage from, 1721.
 photographed on the Homathco, 1730.

McLENNAN, R.

district engineer in Yellow Head Pass region (1871), 1513.
 began at Kamloops, 1514.
 party: thirty five, 1514.
 all labourers except five, 1514.
 sent back most at Cranberry Lake, 1518.
 with reduced party proceeded to Yellow Head Pass, 1518.
 about six, 1520.
 fourteen left at Cranberry Lake to examine country, 1520.
 thinks a large party was necessary, 1520.
 examined pass in eight days, 1521.
 returned to Cranberry Lake 1st November, 1522.
 to Kamloops about 20th November, 1522.
 proceeded to Ottawa to report, 1522.
 in spring (1872) in the Chilcotin Plains, 1523.
 party: thirty, and twenty-five animals, 1524.
 instrumental examination, 1526.
 thinks explorations should have been made first, 1527.
 reasons for this opinion, 1527.
 further in reference to Albrede Lake and Canoe River, 1533.
 neither Green nor Mahood found a practicable country, 1533.
 during first season, (1871), in B.C., eastern slope of Yellow Head Pass not examined, 1553.

McNICOL, E.

on Bute Inlet survey under Cambie (1875), 1732.
 expedition to Kitlope Valley under Gamsby (1876), 1733.
 did not take latitude at Tochquonyala Lake, 1739.
 had Horetzky's tracing but did not take it from camp, 1739.
 one lake mistaken for another, 1743.
 thought that the lake found at an elevation of fifteen feet was the same as Horetzky discovered at 1,100 feet, 1748.
 complete antagonism between the two sketches, 1748.

LOCATION.

RUTTAN, H. N.

instructed to make location survey at Edmonton (1876), 23.
 party idle under pay for some weeks, 23.

ENGINEERING—*continued.*SURVEYS—*continued.*LOCATION—*continued.*RETTAN, H. N.—*continued.*

supplies : Nixon responsible, 24.
prices not under engineer's control, 24.
party engaged May, 1875, to December, 1876 ; making plans at
Ottawa till May, 1877, 24.

CARRE, H.

in charge of location on contracts Nos. 14 and 15, June, 1874, 129.
party : over forty men, 129
so engaged till January, 1875, 129.
witness afterwards took soundings on Red River while party ran line
from Shoal Lake to Selkirk, 129.
plan and profile of contract No. 15 asked for by Rowan, December,
1874, 129.
made it roughly on unprinted wall paper, 130.
quantities calculated from it in Ottawa by Frank Moberly and
party, 130.
thinks profile made from it was correct, 130.
not cross-sectioned or test-pitted, 130.
contract No. 14 located by Brunel to Brokenhead, thence by Forrest,
176.
witness's survey only preliminary, 176.
Brunel's survey expedited work about a fortnight, 176.
Selkirk crossing : witness recommended half a mile south of Sugar
Point, 177.
Brunel's crossing about a mile and a-half north of this, 177.
good rock foundations at Sugar Point, Brunel's clay and loose
sand, 177.
from Rat Portage to Red River, 1447.
in charge of locating party in spring of 1874, 1447.
how a trial line is run, 1448.
difference between trial and location, 1449.
a line the exact centre of road-bed, 1449.
witness's line only practicable one on that route, 1451.
with the approved grades, 1451.

JARVIS, E. W.

southern route Rat Portage to Winnipeg discussed with Carre, 291.
thinks \$500,000 would have been saved by it, 292.
reasons for statement, 292
route from Eagle Lake to Sturgeon Lake favourable for railway, 293.
from Red River to Edmonton, 294.
thinks better line could have been obtained north of the North
Saskatchewan *via* Moose Hills, 294.
Selkirk crossing : cost of bridge near rapids about half cost at
Selkirk, 297.
recommended crossing at St. Andrew's Rapids, 298.

FORREST, H. F.

from Rat Portage to Brokenhead River, 349.
under Carre on trial location June, 1874, 349.
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