

PAGES

MISSING

Canadian Engineer

A weekly paper for Canadian civil engineers and contractors

Reconstruction Messages

to the people of Canada from three prominent members of the Federal Cabinet.

Extracts from speeches delivered last week at Ottawa at the First Conference of the Association of Canadian Building and Construction Industries.

Hon. A. K. MacLean,

Chairman of the Reconstruction Committee of the Privy Council:—

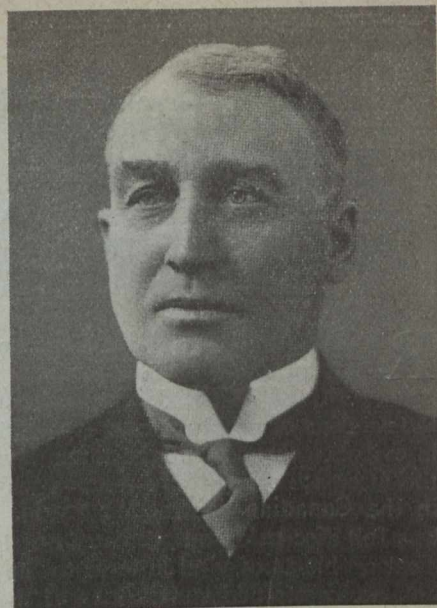
"I have no hesitation in saying that governments, provincial and local, municipalities, cities and towns which have deferred construction programs should resume them at once.

"There is no restriction to-day upon the issue of securities by any government whatever, provincial or municipal, so that these representative bodies are at liberty to go into the money markets and procure their money for construction programs, and it is the duty of all representative bodies to give a lead to the people of Canada at this moment when things are more or less confusing.

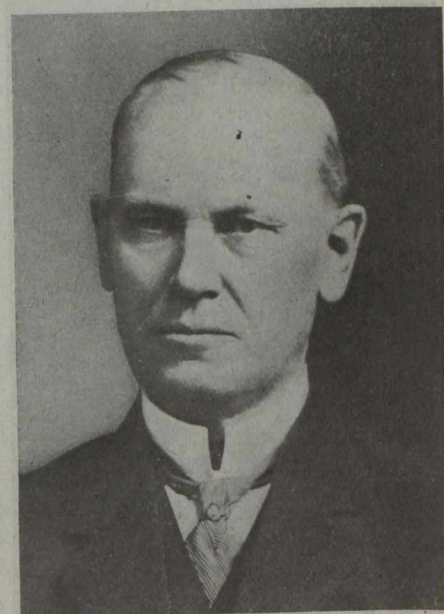
"For the whole of Canada there has been a deferred construction during the past four years of approximately one billion dollars, exclusive of public works, railroads, etc. This promises great activity in building industry and means prosperous times for all parts of Canada.

"Outside of Canada we can count on a large share of business that will contribute to our prosperity, and that will help to solve any problem arising from the demobilization of our soldiers and war workers. . . .

"The transition from war to work cannot be so great as from work to war. We can face the future with courage and confidence. We have the capacity to develop; we have vast resources."



HON. A. K. MACLEAN



HON. FRANK CARVELL

Hon. Frank B. Carvell,

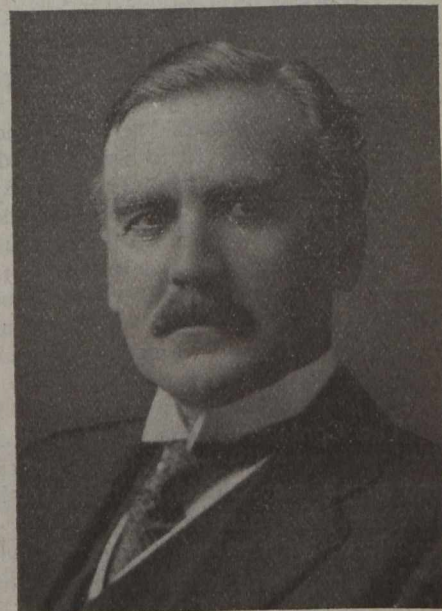
Minister of Public Works:—

"For the past year we have been putting on the brakes as hard as we could, endeavoring to save all our money for war purposes and not to spend money otherwise. Now that the war is over we look at the question of public expenditures from an entirely different standpoint.

"The Government is justified and is called upon to spend money on any work of economic advantage, even if the cost should be increased. We must have much broader outlook during the coming year than we had for the past two or three years from a building trades standpoint.

"It is our duty to branch out in a building program. . . .

"Although it was important that money be conserved during the war, it is now equally important that money be spent in reasonably useful projects."



HON. SIR THOMAS WHITE

Hon. Sir Thomas White,

Minister of Finance and Acting Premier:—

"In our opinion it would be desirable to proceed with works of immediately productive character. . . .

"The railways are run down and many industrial plants of all kinds are suffering from lack of repair.

"In all cities and towns throughout the country, building operations of a private character have been delayed."

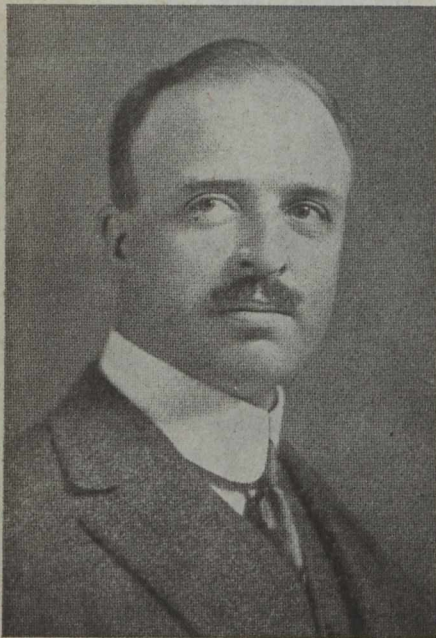
Building Industries Conference at Ottawa

Nearly Two Hundred General Contractors, Sub-Contractors and Representatives of Supply Firms Form Active New National Organization to be Known as the "Association of Canadian Building and Construction Industries"—National Reconstruction Problems Discussed and Large Amount of Ground Covered in Busy Three-Day Conference

RECONSTRUCTION was the key note of the Building Industries Conference held last week at Ottawa. The desire to assist the Government in the solution of problems now facing the country was more in evidence throughout the three days' sessions than was the attempt to right any wrongs which may exist to-day in the Canadian contracting world. Nevertheless, there was full discussion on scores of purely business and technical problems of vital interest to the engineers, contractors, architects and supply men of the country, and work

did not prove to be exactly a vacation trip for many of the members who attended, but as a result a really large amount of work was accomplished.

The committee on Conference arrangements had met on Monday and arranged the points to be covered in the preliminary work of the Conference, together with a list of necessary motions and suggested movers and seconders, so that this work was put through on Tuesday morning with great celerity and would have been completed before luncheon had the session started on time.



First Officers of the Association of Canadian Building and Construction Industries

J. P. ANGLIN, *President*

FRED ARMSTRONG, *Vice-Chairman*

H. DANCY, *Honorary Secretary*

was done which will result in lasting improvement to the status of all of these groups.

The first session of the Conference was scheduled to have been called at 10.30 a.m., Tuesday, November 26th, according to the preliminary program, but as the special Pullman car carrying the Toronto delegation arrived late, the meeting was not called to order until after 11 o'clock.

That was the only delay or lost time in the whole three days. The work of the Conference proceeded morning, afternoon and evening until nearly midnight Thursday. Even the luncheon hours every day were utilized, addresses being delivered by prominent members of the Dominion Government.

The Conference was divided at the start into three sections; namely, general contractors, sub-contractors, and supply men. Each of these sections formed its own permanent organization, held meetings and made separate reports to the sessions of the general Conference.

In turn, there were numerous committees composed of representatives of the three sections and these committees had frequent meetings, some of them lasting into the small hours of the morning, so that the Conference

J. P. Anglin, of Montreal, who was the originator of the idea of holding the Conference, was elected temporary chairman; Fred Armstrong, of Toronto, temporary vice-chairman; H. Dancy, of Toronto, temporary secretary; G. A. Crain, of Ottawa, temporary treasurer.

The organization of the following committees was perfected. Points of Order; Finance; Publicity; Permanent Organization; Resolutions and Order of Business; Attendance, Membership and Members' Welfare; Building Situation; and Business Relations. The members of each committee were requested to chose their own chairman.

It was decided that the executive committee to be in general charge of the Conference should consist of the above-mentioned temporary officers and the temporary chairmen of the three sections. W. E. Ramsay, of Montreal, was chosen as temporary chairman of the supply section; Norman McLean, of Vancouver, temporary chairman of the general contractors' section; W. A. Mattice, of Ottawa, temporary chairman of the sub-contractors' section. H. Elgie, of Toronto, presented a resolution signed by a number of representatives of builders' exchanges, stating that after a full discussion of the situa-



A Few of the Contractors Who Formed the New National Association

tion in Canada, they were in favor of the formation of an organization to be called the Association of Canadian Building Industries. It was later decided by the Conference that this name did not adequately represent the scope of the Association, which includes many general contractors and others who are interested in general construction work rather than in actual buildings, so the words "and Construction" were inserted after the word "Building."

Mr. Anglin stated that the object of the Conference was to stabilize the whole building industry of Canada. "It is a big job," he said, "because the building industry is the poorest organized industry in Canada; yet I am told that we employ the second largest number of men in the country. The farmers come first, and second comes the building industries. I do not mean those actually engaged in construction work, but including the manufacturers of materials entering into structures."

"We who are the responsible men in this business should organize an association to see to it that we get a square deal. We are looking for a square deal not only from those with whom we do business, but from one another. We have had internal troubles, and we sometimes think that the man who is opposing us for a contract is a terrible fellow, but when we meet him we find that he is all right. There is only so much work coming out each year and there is no reason why any of us should take business at a loss."

Must Participate in Reconstruction

"We must take our part also in the reconstruction movement. There are many meanings of this word 'reconstruction.' Many folks think that it only means rebuilding something that is smashed down. That is not the meaning of the word in its present connection. Society has experienced an upheaval and it is up to society to reconstruct itself in accordance with the conditions of the world's new democracy. It is of the utmost importance that we as contractors organize right now, for our share in this reconstruction work, what should ultimately prove to be one of the most important organizations in Canada."

Mr. Anglin called the attention of the members to a large sign which read "Minimum value of Conference time, \$10.00 per minute. Increase it by remarks both direct and brief."

It was decided to limit each speaker to one minute, and although this was later extended to two minutes and

at some of the sessions three minutes, it proved to be a very useful rule in stopping orations when the members wandered from the particular subject in hand.

Ed. Cass, of Winnipeg, stated that as a result of 45 years' experience as a contractor, he had come to the conclusion that one of the greatest difficulties in the business is the form of contract. "In Manitoba," said Mr. Cass, "we have a uniform contract. We got architects, contractors and others to agree to a form of contract which gives the contractor some legal status. It has been in vogue for eight or ten years, and has proved quite satisfactory excepting that it unfortunately exempts Federal and Provincial Governments, railways and municipalities. This is the time to apply such a contract to all persons."

Desirability of Uniform Contracts

"Nobody should expect a contractor to sign a contract which does not give a square deal to both parties. I was recently presented with a contract which occupied not less than 81 pages. The contractor who signed it would be a bond slave with no status or 'say.' There should be a uniform contract of not more than two or three pages."

"The possibility of such a contract was called to my attention many years ago by an American railroad company then operating in Manitoba, who sent me a contract of only one and a half pages, although the work amounted to about \$400,000. I formed the idea then that we should have a contract of that kind adopted throughout the province. A similar form of contract should be adopted by each of the other provinces, and so far as possible all of these contracts should be made alike so that we might have a national uniform contract."

"Another matter with which we should deal is that tenders should be opened publicly. This is the only honest and fair principle. It costs a great deal of money to figure on a contract sometimes, and the tenderer should be allowed to be present when the tenders are opened and read, and the contract should be awarded to the lowest bidder who complies with the conditions. We all know there has been much talk about graft and dishonesty in the letting of some contracts, and after we have won this war for democracy it should be in every one's interest to see that our work in that war is made effective in our own domestic relations."

"The supply man is also interested in seeing that the contractor gets a square deal. If the contractor cannot



Some More of Them on Their Way To Interview "The Government"

live, the supply man is affected because he cannot get his money."

Mr. Elgie, of Toronto, presented a memorial which had been signed by a large number of public bodies throughout Ontario, calling upon the Dominion Government to give greater preference to Canadians and Canadian materials, but upon motion of Col. Little it was decided that this should be referred to the resolutions committee before being acted upon by the Conference.

Interesting Telegrams

Anglins, Ltd.,
Contractors, Montreal.

Will you kindly inform me by wire if there is a Canadian organization of builders? If so, who are official heads?

A. K. MacLean, Privy Council.

A. K. MacLean,
Privy Council, Ottawa.

Canadian Association of Building Industries formed and conference called for November 26th in Ottawa. Could I, as chairman, see you tomorrow morning?

J. P. Anglin.

J. P. Anglin,
65 Victoria St., Montreal, Que.

I am pleased to learn that a conference of the building contractors and building supply dealers of Canada has been called for November 26th, 27th and 28th, to meet in the Chateau Laurier, Ottawa. If this meeting had not already been planned, I had myself intended requesting such a gathering. I hope that every responsible building contractor and supply dealer will attend, and I will co-operate with you as far as possible in reconstruction matters.

A. K. MacLean.

At 11.30 a.m. the Conference adjourned, and at 1 p.m. luncheon was served, at which the Hon. A. K. MacLean, chairman of the reconstruction commission of the Dominion cabinet, was the guest of honor. Mr. MacLean's speech, slightly condensed, appears on another page of this issue.

At the Tuesday afternoon session of the Conference, the personnel of the business relations, labor conditions, legal affairs and code of ethics committees was selected. The names of the members of these committees and also

of those mentioned above, appear on page 501 of this issue.

The chairman read the following telegram from D. A. Garber, president of the Associated General Contractors of America:

"The Associated General Contractors of America formed at Chicago was named to include Canadian contractors. Invite you to join with us in one great association. Best wishes for a rousing meeting."

The following letter from Mr. Garber was also read:

"From the indications at the convention, our Association will meet with the support of all contractors and as the problems of the Canadian contractors are the same as ours, I believe a combination would be much stronger than individual associations in each country, and co-operation would undoubtedly result in good to the general contractors on each side of the line.

Invited to Join U.S.A. Association

"I would be greatly pleased to have the proceedings of your meeting and I have wired to Chicago to mail you the proceedings of the Convention of the Associated General Contractors of America.

"It is too late this time for me to send a delegate to your conference, much as I would like to do so, but you have our hearty good wishes for a successful meeting."

A telegram was also read from J. P. Oullette, president of the Royal Architectural Institute, making a protest against alien architects and contractors being employed by the Dominion Government and offering to co-operate with the representatives of the building industries in any representations the latter might make to the government in this respect.

The Conference decided to leave these communications to be answered by the executive.

At this point Mr. Anglin requested the vice-chairman, Mr. Armstrong, to take the chair.

Mr. Ramsay, of Montreal: "After hearing the able but non-committal address from our guest at luncheon, and after listening to his optimistic and inspiring advice, I would suggest that this Conference adopt as a slogan, 'Boost, Build or Bust,' suggested by our guest to-day."

Mr. Ramsay subsequently explained that this slogan was actually a suggestion made to him by Mr. MacLean. It was unanimously adopted by the Conference.

The general meeting adjourned at 4.30 p.m. to permit meetings being held by the individual sections. E. R. Reid, of St. John, N.B., was selected as temporary secretary of the general contractors' section; W. F. Evans, of Toronto, temporary secretary of the supply section; and E. Dennis, of London, in a similar capacity for the sub-contractors or "trade" section.

By request of the executive, publicity will not be given to the internal discussions of the various committees or sections, as it is deemed advisable that the only matters that should be made public are those that were passed by

"BOOST, BUILD OR BUST"

Official Slogan Adopted by the Association of Canadian Building
and Construction Industries at the Suggestion
of the Hon. A. K. MacLean

the conference at large, and that the work of the committees and of the sections should be represented by their reports to the Conference.

Committee meetings were held Tuesday evening at 8, 9 and 10 o'clock, and the work of some of these committees was not completed until 2 a.m.

Resolutions Effecting

Permanent Organization

The report of the committee on permanent organization was presented when the Conference reassembled at 10 o'clock Wednesday morning. This report, which was presented by Chairman Oakley, consisted of three resolutions, as follows:—

Resolution No. 1—Whereas there is at the present time no central organization in Canada having the interests of the building and construction business under its hand; and

Whereas we believe that for this reason no stable conditions exist in this business, such a situation resulting in the failure to build up a reliable and virile profession;

Therefore, be it resolved that for the betterment of these industries such a national organization shall be formed whose duty shall be to establish and promote a new standard in the various phases of construction enterprise.

That it is desirable that the headquarters of the proposed organization shall be the city of Ottawa,—the Federal Capital;

That the name of the proposed organization shall be the Association of Canadian Building Industries;

That all individuals, firms or corporations engaged in any branch of building industry, having their permanent offices in the Dominion of Canada, shall be eligible for membership; and

That the compiling of the by-laws and constitution of association be left in the hands of the National Council.

Resolution No. 2—Whereas we, assembled here for the purpose of forming a national organization of Canadian building industries, fully recognize the existence of many Builders' Exchanges and kindred organizations throughout Canada which are doing an excellent work of local interest in the various cities and towns in which they are active, and whereas the desire of this national organization is to assist and encourage their work for the betterment of interests involved;

Therefore, be it resolved that all existing Builders' Exchanges, associations, and bodies composed of similar interests, and in the absence of such, the Board of Trade of any locality, be invited to affiliate and co-operate with this national body; and

That the assessment of annual fees relating to existing co-operating organizations as well as individual firms and corporations be determined by the National Council.

Resolution No. 3—That the executive of this national association be composed of a minimum of twenty-five members, selected by geographical location and embracing every section of the Dominion, including in its body a president, a first vice-president, a second vice-president,

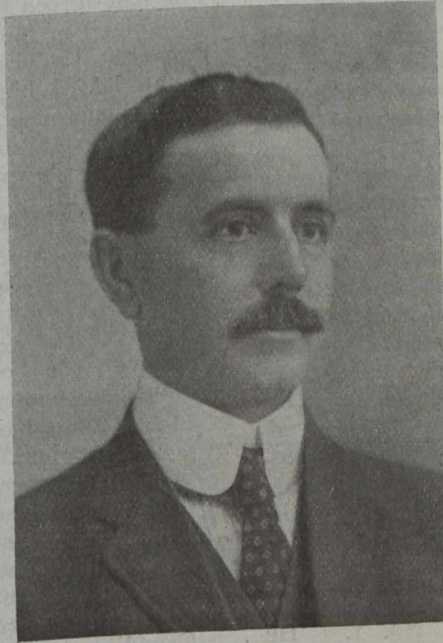
an honorary secretary, and an honorary treasurer, with power to add to its membership as necessity demands.

That the proposed by-laws provide that the office of president shall be filled by a general contractor, of first vice-president by a "sub" or "trade" contractor, and of second vice-president by a supply dealer or manufacturer.

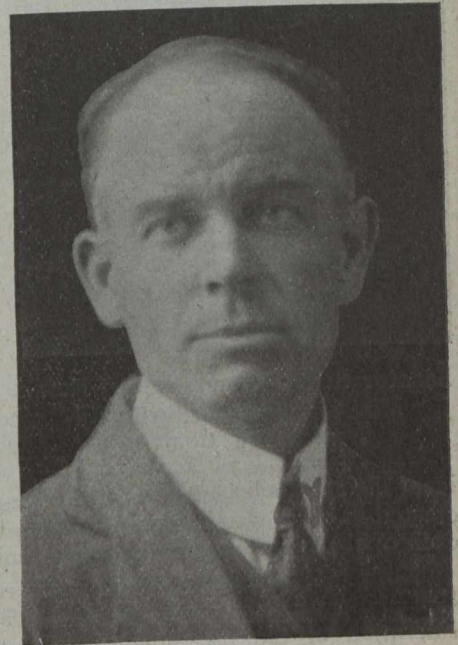
What Are "Permanent Offices"?

The phrase "having their permanent offices in the Dominion of Canada" in the first resolution, referring to eligible membership, caused considerable discussion. Some members thought that there should be more rigid requirements for membership, and that "permanent offices" should be more clearly defined.

Mr. Oakley said that the committee did not desire to bar out firms from other countries, but merely wished them to come to Canada and to open an office here, so that the contractors would have some tangible place in



G. A. CRAIN, Secretary
Who is also the Association's Treasurer



ALEX. I. GARVOCK, President
of Ottawa, Ont.

First Officers of the "General Contractors' Section"

this country where they could transact business with each firm.

It was moved that this clause be referred back to the committee for further consideration as to what constitutes a permanent office, but several members of the committee stated that the clause had already been discussed thoroughly by them, and that it was quite useless to refer it back for further consideration, because they would not change their opinion or the wording of the clause. The Conference accepted this statement and adopted the resolution as it stood, with the exception of adding the words "and Construction" after the word "Building" in the name of the association.

This change was moved by Mr. Sparling, of Toronto, who urged that the title of the association should clearly include those who are doing construction work of all kinds: sewers, waterworks, railways and all classes of contracting besides buildings. The suggestion that this change be made originated with Mr. Ramsay, of Montreal, who thought that the association should secure the widest publicity for every branch of construction enterprise.

The second resolution was adopted with an amendment by Mr. Baxter, substituting the words "section of the Board of Trade relating to building and construction industries" for the words "Board of Trade of any locality."

It was suggested that the resolution be amended to provide for a permanent, paid secretary. The Conference decided that this matter should be left to the executive, although all agreed that such an official would be



Senator G. D. Robertson, the New Minister of Labor, who Addressed the Conference

necessary if it be desired to carry on the good work effected by the Conference.

The third resolution was adopted with an amendment proposed by Mr. Dillon, that all members of the association be eligible to any office. Another amendment was made to this resolution at a later meeting, in order to eliminate all possibilities of sectional differences between "east" and "west"; the offices of the "first" and "second" vice-pres-

ident being abolished and nine vice-presidencies being created in order that there might be a vice-president from each of the nine provinces in the Dominion.

Norman McLean, of Vancouver, requested a discussion of the objects of the association and urged a reconsideration of the preamble of resolution No. 1. He moved that the words "and for the purpose of aiding the government in all matters belonging or appertaining thereto" be added to the preamble.

The chairman, Mr. Armstrong, said that it is the duty of every citizen to assist the government as much as possible and ruled Mr. McLean's motion "out of order."

G. B. Greene, supported by a number of others, made a hard fight to have the preamble remoulded to express broader and higher ideals, feeling that the resolution as adopted was too entirely self-seeking in the business interests of the members of the association and that it did not truly represent the original and actuating motives which had led to the calling of the Conference. A motion by Mr. McLean, seconded by Mr. Greene, that the preamble of resolution No. 1 be referred back to the committee for further discussion of the aims and objects of the organization, was lost by a very close vote.

Report of the Committee on "Building Situation"

Arthur Dinnis, of Toronto, presented the report of the committee on "Building Situation." This report took the form of a resolution that the Conference present certain requests to the government and it was adopted with some minor amendments. The list of requests embodied in the resolution appears on page 488 of this issue.

Mr. Oakley enquired whether raw or finished products were meant when the government is asked to use only Canadian materials. Mr. Dinnis replied that the resolution embraced both raw and finished products. The committee had been of the opinion that every encouragement should be given by the government to the development of Canadian sources of raw materials of all kinds, whether by subsidies, adjustment of freight rates, tariff revision or otherwise.

Mr. Oakley explained that he is interested in the cut stone business and said that nine-tenths of the men in that industry would have to go out of business if they were forced to use only Canadian stone. We have stone in Canada but there are imported stones that are more adaptable, notably Ohio sandstone and Indiana limestone. All the stone for the building in which the meeting was being held (the Chateau Laurier), for instance, had been cut in Bedford, Indiana. Some years ago the stone interests of Canada had interviewed Sir Thomas White and he had agreed that the artisans of Canada should be encouraged in the work of cutting the stone, but had not thought it advisable to restrict the importation of the raw material. A higher tariff had then been imposed on the finished product, with the result that there are now in Canada establishments for the dressing of stone that compare favorably with the best United States plants.

Lumber and Steel Difficulties

William Rutherford, of Montreal, spoke for the lumber interests, asserting that there are a great many economically useful varieties of wood that are not grown in Canada. The exclusive use of Canadian materials is desirable,

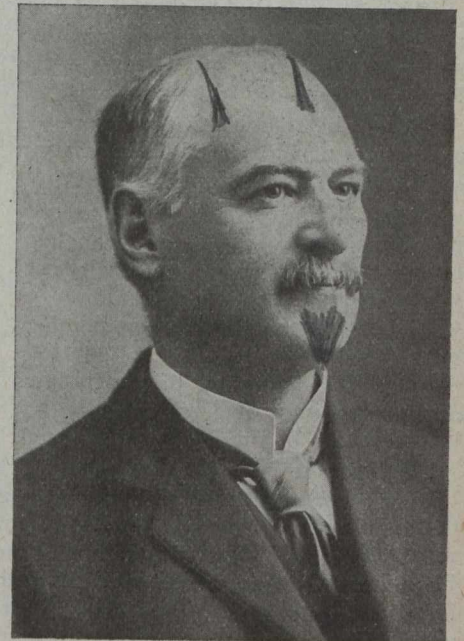
"if possible," said Mr. Rutherford, but those words "if possible" should be included in the request that only Canadian materials be used.

John W. Seens, of Montreal, told about the difficulties in the way of getting a supply of steel all "made in Canada." The largest beam rolled in this country, for example, is an 8-in. beam, and 4" x 4" is the largest angle.

The cost of establishing mills for rolling large sections is too great to expect such mills to be built in Canada until the demand is greater than at present, although he had no doubt but that such mills would some day be erected in Canada.

Charles Lowrey, of the Queenston Quarry Co., St. Davids, Ont., spoke from the other side of the controversy, claiming that Canadian stone industries are lying idle while great quantities of stone are being imported, and he advocated the development of domestic resources.

It was decided by vote of the Conference to insert the words "if possible" when approaching the government.



Hon. J. D. Reid, Minister of Railways and Canals, Who Spoke for the Government

A suggestion was made that the words "wherever economic design is not hampered thereby" be substituted for the words "if possible." This suggestion was lost upon division.

The report also included a recommendation that the members of the conference should pledge themselves by standing vote never again to use German or Austrian goods.

This recommendation had been passed unanimously by the committee; and when it was first read at the conference, it was heartily applauded. But later some members pointed out that the question was political and not within the scope of the Conference. Mr. McLean and Mr. Phinnemore thought that we should be governed by the Versailles conference in such matters and that the peace terms might be such as to encourage trade with Germany. Mr. Ramsay and all the other speakers who supported this viewpoint emphatically stated their own personal intentions, however, to have no more dealings with German firms and expressed full sympathy with the idea underlying the recommendation, although feeling that it might be a dangerous resolution for the Conference to adopt before the termination of the peace treaties. The chairman then declared he recommended to be political and out of order, so no vote was taken on the question.

After adjournment of the Wednesday morning session, a luncheon was held at which Hon. Frank Carvell was the guest of honor. A summary of Mr. Carvell's speech appears on page 498 of this issue.

At 2.30 p.m. the afternoon's work began, most of the time until 7 p.m. being taken up by sectional and committee meetings.

General Contractors Form Separate Permanent Section

It was decided to effect permanent organizations of the general contractors, trade contractors and supply sections, each section to be authorized to act independently of the others in any matter pertaining to its own welfare, and also to discuss any contentious points with the other sections. The officers elected for the ensuing year were as follows:—

General Contractors' Section:—Chairman, Alex. I. Garvock, of Ottawa; secretary, G. A. Crain, of Ottawa.
Executive Committee:—The chairman, the secretary and H. Hayman, of London; Ed. Cass, of Winnipeg; Jos. Gosselin, Jr., of Quebec; H. Dancy, of Toronto; and J. P. Anglin, of Montreal.

Trade Contractors' Section:—Chairman, W. A. Mattice, of Ottawa; secretary, E. R. Dennis, London.

Supply Section:—Chairman, W. E. Ramsay, of Montreal; secretary, W. Frank Evans, of Toronto.

Informal talks, not for publication, were given at the opening of the Wednesday afternoon session by Norman McLean, of Vancouver; Col. Little, of Port Arthur; E. E. Poole, of Regina; John Eadie, of Vancouver; and other westerners on the special needs of the parts of the Dominion which they represented in the Conference.

National Council at Ottawa

It was decided that the National Council to be formed should meet at Ottawa as occasion requires and should assist the government, the Boards of Trade, the Builders' Exchanges, the Trades and Labor Congress and any other representative organizations in the solution of problems in which the building industries are interested.

At 8 o'clock Wednesday evening, a large audience gathered to hear addresses by Francis Hankin, J. Grove Smith and Fred Armstrong.

Mr. Hankin, of Montreal, is the general secretary of the Canadian National Reconstruction Groups. He delivered an inspiring talk on the duties of the individual during the reconstruction period and explained in a very interesting manner the objects of the voluntary "recon-

National Council of the Association of Canadian Building and Construction Industries

- *J. P. Anglin, President, Montreal, Que.
- *Fred. Armstrong, Vice-Chairman, Ontario.
- *J. C. Harvey, Vice-President, Nova Scotia.
- *J. A. Grant, " " New Brunswick.
- *P. A. Galarneau, " " Quebec.
- *Ed. Cass, " " Manitoba.
- *William Wilson, " " Saskatchewan.
- *J. E. McKenzie, " " Alberta.
- *Norman McLean, " " British Columbia.
- *G. A. Crain, Hon. Treasurer, Ottawa, Ont.
- *A. H. Dancy, Hon. Secretary, Toronto, Ont.
- *W. Ramsay, Member ex-officio, Montreal, Que.
- *A. I. Garvock, " " Ottawa, Ont.
- *W. A. Mattice, " " Ottawa, Ont.
- Geo. A. Perrier, Halifax, N.S.
- A. D. Smith, Amherst, N.S.
- E. R. Reid, St. John, N.B.
- J. F. Tilton, St. John, N.B.
- James Ballantyne, Montreal, Que.
- W. H. Ford, Montreal, Que.
- Jos. Gosselin, Jr., Quebec, Que.
- Wm. Irving, Montreal, Que.
- William Rutherford, Montreal, Que.
- Thos. Chick, Windsor, Ont.
- Walter Davidson, Toronto, Ont.
- W. E. Dillon, Toronto, Ont.
- A. T. Enlow, Hamilton, Ont.
- W. R. Geikie, Oshawa, Ont.
- H. Hayman, London, Ont.
- Stewart Hughes, Toronto, Ont.
- Col. J. A. Little, Port Arthur, Ont.
- A. C. Nobbs, London, Ont.
- Geo. Oakley, Jr., Toronto, Ont.
- James Phinnemore, Toronto, Ont.
- J. F. Schultz, Brantford, Ont.
- W. P. Alsip, Winnipeg, Man.
- T. R. Deacon, Winnipeg, Man.
- H. T. Hazelton, Winnipeg, Man.
- Chas. Forbes, Moose Jaw, Sask.
- W. R. MacKenzie, Regina, Sask.
- E. E. Poole, Regina, Sask.
- Duncan Smith, Saskatoon, Sask.
- G. H. Whitlock, Moose Jaw, Sask.

An executive vice-president to be elected from Prince Edward Island; one councillor to be appointed by the Winnipeg Builders' Exchange; four to be elected from Alberta; and four from British Columbia; making a council of fifty elected members and three "ex-officio" or section representatives.

*Members of the Executive Committee of the Council.

struction groups" which meet to discuss the outstanding questions of the day. Mr. Hankin recently published a booklet explaining this work in detail, and it has been offered for sale to the public at fifty cents per copy.

Mr. Smith, who is one on the staff of the Commission of Conservation, addressed the members on "Fire Waste," showing the need for town planning and better and more permanent types of structures. Mr. Smith's ideas upon this subject, which are the result of several years of study and observation, have already appeared in detail in the report on this subject that was published last summer by the Commission of Conservation, and which is being distributed free of charge by that organization.

Mr. Armstrong spoke briefly on the housing problem and read a letter from Thomas Adams which appears in full on page 500 of this issue.

Following the three addresses above mentioned, the business of the Conference was resumed by the presentation of the report of the committee on Business Relations, which consisted of the following three resolutions:—

Business Relations Committee Report

Resolution No. 1—This committee, after carefully considering (a) Percentage, (b) Cost plus fixed sum, (c) Lump

sum, methods of payments, recommend that a standard form of contract be framed by a suitable committee appointed by the permanent executive.

Resolution No. 2—Whereas it is vital to the interest of contractors that their business should be stabilized, and

Whereas the competition of incompetents is not only disastrous to the legitimate contractor, but is also detrimental to the public interest; and

Whereas the present system of awarding contracts does not encourage the best work therefore

Resolved that advertisements for tenders for public works should state the time and place for a public opening of said tenders, and before any tenders be accepted that qualifications of the tenderer from the standpoint of experience, ability and equipment, be ascertained, and that a copy of this resolution be forwarded to all departments of public works, federal and provincial and to leading municipal and industrial corporations.

Resolution No. 3—That the Conference be asked to consider the question of foreign competition, and also the memorial prepared by the Provincial Association of Contractors of Ontario.

Following the presentation of the above resolutions, Mr. Elgie, of Toronto, was requested to read the memor-

(Continued on page 502)

Formal Interview With Representatives of the Dominion Government Pleases Building Industries Delegates

ACTING Premier Sir Thomas White, Minister of Finance; Hon. J. D. Reid, Minister of Railways and Canals; and Hon. Frank Carvell, Minister of Public Works, represented the Dominion Cabinet in a formal interview granted last Thursday afternoon to the contractors and supply men who attended the Building Industries Conference.

J. P. Anglin, chairman of the Conference, explained to the ministers that the contractors were meeting for the first time as a large body representing the entire building industry. He said that they were approaching the Government not in any spirit of criticism, but with every desire to offer their services in any way conducive to the best interests of the country during the period of reconstruction.

Fred Armstrong presented the following requests expressed by resolutions previously passed by the Conference:—

Requests Presented to Government

1.—That the Department of Public Works of the Dominion Government use Canadian materials in the erection of all public buildings.

2.—That the Department of Public Works commence operations on all delayed public works as soon as possible.

3.—That the Dominion Government call for tenders in the usual way on stated plans and specifications for all works let under the Dry-Dock Subsidy Act.

4.—That the Government grant substantial federal aid for the purpose of constructing permanent national roads, and that such work be let by tender.

5.—That any work for the Federal or Provincial Governments, municipalities, railways, corporations, etc., be let and executed under statutory form of contract.

6.—That where commissions are appointed to undertake housing operations, the Association of Canadian

Building and Construction Industries be represented on the commission.

7.—That the advisability of proceeding at once with the housing propositions now before the Government be discussed with a view of providing proper accommodation for industrial workers and eliminating slum districts in large centres.

8.—That the development of the natural resources of Canada be subsidized wherever necessary in order to compete with foreign materials.

Mr. Armstrong very ably explained each request in some detail, letting the ministers know the particular reasons actuating each one. He was supported by Mr. Anglin, who told of the formation of the National Council as a representative board of all the building industries throughout Canada from east to west, and promised that the Government would hear further from this board from time to time.

"Does your Association represent all types of construction work, such as harbors, canals, and so forth?" asked Sir Thomas White. Mr. Anglin assured him that it does, and Sir Thomas appeared to be very gratified at the broad scope of the organization.

Mr. Anglin assured the ministers that it was the intention of the members of the Association to follow up these same matters with the Provincial Governments and the municipalities, and stated that there were then on the roll of the association 56 general contractors, 34 "sub" or "trade" contractors, and 92 supply firms.

As acting head of the cabinet, Sir Thomas White made the first reply. He said that he had always been convinced that a man cannot be a good builder if he is not a good citizen; that high ability and good character are always required in construction work, and that these qualities are revealed more in this line of endeavor than in any other kind of work.

It must be realized, he said, that Canada, in common with all the other Allies, has assumed a heavy responsibility in the war.

The war brought unequalled opportunities. Some have been able to maintain their normal business, others have had their business greatly increased because their trades were more nearly related to war essentials or on account of some exceptional opportunities. In the case of builders or contractors, generally speaking the past four years has been rather a trying period. This notably applies to builders and architects throughout the country.

There was a period of readjustment when the war broke out. Then the policy of the Government had been to continue existing works—not to close down quickly, but to go ahead for a time with such public works as were under way, and the program was even supplemented for six months or a year so as to bridge over a trying period in order to avoid unemployment until war work should be organized.

Then, continued Sir Thomas, we were faced with the enormous expenses of the war. The result was, and properly, that we had to discontinue our program of works projects in mind before the outbreak of the war, improvements that would have been made had the war not occurred, were not gone on with.

We have now come to a critical period of dislocation and reconstruction. The same problems face us as at the outbreak of war. The great volume of war business came suddenly to an end. There may be considerable unemployment. We are considering ways to meet this. One way is to obtain big orders from France and Belgium. We are bending every effort to obtain a large amount of business of that kind, and have every hope that plans in this direction will be carried out O.K.

Domestic Reconstruction

Then there is domestic reconstruction. The railways are run down and many industrial plants of all kinds are suffering from lack of repair. Between the business we hope to get from overseas and the domestic reconstruction, a very considerable amount of labor will be absorbed.

Also there will be a steady and increased demand for agricultural products.

In all cities and towns throughout the country building operations of a private character have been delayed.

Coming to the larger question of the Government proceeding with public works that have been postponed, Mr. Carvell has spoken to you of this. In our opinion it would be desirable to proceed with works of immediately productive character. We must have a complete national plant such as ports, harbors, canals and other national undertakings, and we might help by proceeding with these when their utility is not in doubt, also with buildings that are of actual benefit to their communities.

Housing is one of the most important of the present problems. Last week we had here a conference of the prime ministers and other ministers of the various provinces, and the housing question was one that was brought forward. It was considered very desirable to promote housing and avoid slums, but we have seen some of the difficulties in taking up housing throughout Canada as a national undertaking. This is a matter for the municipalities and provincial governments, who can deal with it more effectively than can the Dominion Government, but if these bodies require any financial assistance we will be glad to advance it. The municipal governments are under the provincial governments and not the Dominion Government. This subject is an important one from a

social standpoint as well as from the standpoint of building industries.

Regarding the use of Canadian materials, Sir Thomas explained that the Government had always been sympathetic with this idea, not only for the reasons outlined, but for financial considerations, such as rate of exchange, etc. Speaking as Minister of Finance, he stated that from the financial standpoint this request by the Conference was economically along sound lines.

Minister of Public Works Replies

Following Sir Thomas White, Hon. Frank Carvell addressed the members of the conference, stating that although it was important that money be conserved during the war, it is now equally important that money be spent in reasonably useful projects. As much labor as possible should be provided for, even if it were to cost more to some extent.

Making a direct reply to the first request presented by the conference regarding the use of Canadian materials in government work, he said that he had always adhered to this in the past and he had no intention to depart from same, but that some peculiar conditions arise. There is nothing in my department that gives me more trouble, said Mr. Carvell, than Canadian marble and stone. The difference between their cost and the cost of the American materials is greater than the difference ought to be. Then there are certain materials that we cannot get in Canada. For the Parliament Buildings, for instance, we were compelled to deviate from our rule because we could not get the material required in Canada.

Regarding specifications for dry-docks, I don't think that the gentlemen who drew up this request could have understood the modus operandi of the Dry-Dock Act. I think they must have been thinking of government dry-docks. It is impossible to carry out the suggestion, as the docks which receive the subsidies are private docks and the subsidies are fixed amounts per annum. In connection with the government docks we do prepare plans and specifications and call for tenders in the manner suggested.

The housing problem is receiving the attention of the provincial governments and there will no doubt be work in this field which will employ an immense amount of labor.

All public works should be let by contract and by public tender. On only two occasions have we deviated from this principle and that was when time was so very essential. At Dartmouth and at North Sydney we were constructing works for the American government for a naval aerial service and the work had to be done so rapidly that there was no time to prepare plans and specifications and to call for tenders. This work, however, has now been discontinued to a great extent. We do not escape criticism altogether, however, by this method of letting contracts. In one city I am being severely criticized at present because we are not making more speed with the carrying out of certain work which was let by contract and public tender.

We are very glad to see that your conference has settled all distinctions between east and west by electing vice-presidents from each province. Canada can work out its destiny only by there being no east and no west, but only one united Canada working for the best interests of all concerned.

Minister of Railways and Canals Speaks

The last speaker representing the government was the Hon. J. D. Reid, who said that during the last four years the railways had been allowed to run down and a

large amount of materials are needed to put them into the best operating condition. Large orders have already gone forth for materials of this sort.

I have had the matter up with the government railway representatives who were here yesterday, said the minister, and they are now busy preparing some policy whereby we will utilize a great deal of labor. There are also sev-

eral canal systems on which we were planning work before the war and I am taking these matters up with the various departments to see whether we cannot take up this work again, and if we can get our plans ready to submit to the Cabinet in the near future, we can proceed with this work without any delay, should the Cabinet deem it advisable.

Reconstruction Minister, Discussing National Problems, Prophesies Considerable Industrial Activity

HON A. K. MacLean, chairman of the reconstruction committee of the Dominion Cabinet, addressed the members of the Association of the Canadian Building and Construction Industries at their first luncheon, held Tuesday, November 26th, at Chateau Laurier, Ottawa.

Mr. MacLean said that the transition from work to war had been a difficult one for this young country. We financed our war and financed our trade during the war and that had been a great deal for a young nation to handle.

The transition from war to work cannot be so great as from work to war. We can face the future with courage and confidence. We have the capacity to develop; we have vast resources.

Immigration will flow into Canada before long and any problem that appears very substantial to-day will then rapidly disappear. Our debt is exceedingly large for a small country, but, if favored with immigration, "as I am sure is coming," said Mr. MacLean, "our debt will be cut in two when we have a population of twelve million people."

Expect European Orders

Ten billion dollars is the estimated amount needed to restore the devastated portions of France. We, as participants in the war, must take our part in this restoration. It is an interallied problem,—an international problem. The Canadian Government has taken steps to have representation made to the various powers that will take part in the restoration of the devastated countries of Europe, of our ability and capacity to furnish some of the materials, and of our ability and intention to finance these people at least to the extent of what we furnish in materials.

"We have practically an assurance," declared the Minister, "from some countries of Europe that very large purchases will be made in Canada in the shape of lumber for purposes of building. This cannot be disclosed to the public just yet; in fact, the details are not fully completed, but I think in so far as those who are interested in that class of building material are concerned, they may rest assured that we shall participate very largely."

In England they are undertaking a construction program of some three to four hundred thousand buildings,—not all in one to two years, but such is the program that they have mapped out. We must assuredly participate in that construction. Outside of Canada we can count on a large share of business that will contribute to our prosperity and that will help solve any problem arising from the demobilization of our soldiers and war workers. About two hundred thousand war workers must be demobilized and we have at present about four hundred thousand soldiers overseas and at home.

"The demobilization of this number of men presents a possible problem. Personally," said the speaker, "I don't think it is as great as some people imagine it to be. I think we may well face it with courage, and as the days go by we will gradually realize that it is not so serious as it appeared to be a few days ago."

Now what have been the effects of the war on construction work? First, an increased demand for houses; second, cessation in the repair of buildings and structures of all kinds; third, an increase in the cost of buildings and in the rate of interest on money; fourth, a lessened supply of building materials and an increase in the cost of same.

From statistics that I have had before me, in 1912 thirty-five cities in Canada spent \$185,000,000 on building construction. This was exclusive of railway, dock and wharf work and other similar public works.

In 1913 these same cities spent \$165,000,000. The estimated expenditure for the past three or four years has not exceeded \$40,000,000 per annum.

Evidently there has been a deferred construction of at least \$100,000,000 per annum for the last three or four years in just these thirty-five cities, and when we take Canada at large, this sum I think would be very small indeed.

There having been a deferred construction of approximately \$500,000,000 in these thirty-five cities, we may estimate that "for the whole of Canada there has been a deferred construction during the past four years of approximately one billion dollars, exclusive of public works, railroads, etc. This promises great activity in building industry and means prosperous times for all parts of Canada."

My friend the mayor here (referring to Mayor Fisher of Ottawa), says that the government should go on building and should lend money to others to build. This is an easy if a practical solution. I don't say that it should be discouraged. As a matter of fact, this suggestion should be viewed with favor, subject to some restrictions and within certain confines.

We Have the Capital Necessary

We have all the materials needed; we have or will have the labor; and the fact that we have the capital necessary for any problem of construction is shown by our last Victory Loan, and our capital should be available for any line of investment that is both safe and profitable.

Unfortunately in the building industry there will be a probable loss for three, five or seven years, covering the depreciation from the present abnormal building costs. Building should not cease on account of this fact, however.

There cannot be any rapid decline in prices in this country nor in the world.

(Concluded on page 408)

St. John River Affords Big Opportunities

For Development of the Natural Resources of the Maritime Provinces—Deeper Waterway to Fredericton—Flood Control—Reclamation of Waste Land by Drainage—Utilization of Water Powers—Site Proposed for New Tideless Harbor

By FRANK S. SMALL, B.Sc.

Formerly Acting District Engineer, Dept. of Public Works, Fredericton

THE St. John River rises in the Appalachian High-land, flows northeast across Maine, then turns south through New Brunswick and empties into the Bay of Fundy at St. John, after a course of 450 miles. It has a drainage basin of 26,000 square miles, the largest along the Atlantic coast between the St. Lawrence and the Susquehanna. The mean annual rainfall is given as 30 to 35 inches, but information on this point is very incomplete.

It is navigable at low water for vessels drawing 9 feet as far as Fredericton, a distance of 85 miles, and has a number of navigable tributaries which together with the main stream make an inland waterway having a minimum depth of 9 feet for a total distance of about 230 miles or two-thirds the length of the Erie Canal. The main river is tidal for 100 miles. In St. John harbor, the maximum tidal variation is 27.7 feet, while at Indiantown, less than half a mile up the river, the tidal range is about two feet. The explanation of this is found in the action of the great ice sheet which pushed across New Brunswick during the Glacial Period. Prior to that time the river entered the Bay of Fundy somewhat to the west of its present outlet and had eroded a bed to a depth below that of the floor of the bay as it now is. Across this channel the glacier constructed an effective earth dam, the crest of which is now occupied by the town of Fairville. This resulted in the formation of a great inland lake and forced the river to find an outlet for itself over the ridge of hard rock just north of the present harbor of St. John. Thus there is a natural dam across the mouth of the river through which it is slowly eroding a channel for itself, and it will help to understand the lower St. John and its tributaries if we remember that what we now have is the remains of a large inland lake which has been slowly drained as the river wore away the barrier at its mouth.

The Famous Reversible Falls

It has now been eroded to such a depth that mean low water on the river is about 11.9 feet lower than high tide in the harbor. As, however, the channel worn by the river is very narrow, the water in the bay rises much faster than it does in the river, with the result that at the time of high tide in the harbor there is a fall of about 10 feet from the harbor to the river, while at low tide there is a descent in the opposite direction of about 15 feet. This phenomenon is the famous Reversible Falls and it has several very important effects on the river and harbor.

Farther to the east, the Petitcodiac River empties into the Bay of Fundy through a broad estuary offering free passage to the tides. At high tide the Petitcodiac is a broad, navigable but very turbid river. At low tide it consists of two wide, impassable mud flats with a small stream of very muddy water oozing down the channel between them. Except for a few minutes at flood tide its currents are very swift and dangerous. But for the rocky barrier at its mouth the St. John would be nearly as bad as the Petitcodiac in so far as tides are concerned. Currents would race up and down it with such velocities as to render it practically useless for business or pleasure

and instead of being one of the most beautiful rivers in the world, it would be one of the least attractive. Also in the harbor where the currents now are sufficiently troublesome, they would but for the dam be so swift as to render the harbor useless.

This submerged dam across the narrow gorge at the river's mouth has a very important effect on flood conditions. The enormous volume of water draining from the St. John basin in the spring and early summer cannot pass this barrier very quickly, with the result that the lower river holds its flood stages for a remarkably long time. At these times, the flood level of the river is higher than flood tide in the bay and the lower river becomes a non-tidal inland lake, having an area estimated at 600 square miles, or twice that of the artificial reservoir on the St. Maurice created by the dam at La Loutre. Thus the lower river becomes a great flood detention basin and very little sediment is carried into the harbor. In fact, the delta of the St. John is scattered all along the river from the head of tidal influence to Grassy Island 25 miles from its mouth. The higher portions of this delta, such as the plain on which the city of Fredericton stands, were formed when the river first began to cut its new channel through the rocks at St. John and when the level of water was much higher than it is now. These older portions of the flood plain are well above all ordinary present day floods.

Nature Operates the Locks

Passing down the river we find the flood plains gradually getting lower and evidently as the glacial lake was drained the river kept extending its delta until now, as mentioned above, the lower end is at Grassy Island. This is a rapidly growing deposit below which the river suddenly enlarges and from this point to within a mile of its mouth it has a width of several miles and a depth of 60-70 feet or more.

From another point of view, we may say that nature has canalized the lower St. John and its principal tributaries to a total distance of 300 miles or more, and not only that, but four times a day she operates the locks herself, there being two brief periods at each tide when vessels may safely pass the Reversible Falls.

The effects of the obstruction at the mouth of the river have been described at some length for two reasons. First, because it gives the key to present conditions on the river; and second, because some few years ago it was proposed to enlarge the channel through this barrier. From what has been said above, it will be seen that any such work should be undertaken only after a very mature consideration.

As already said, the river is navigable at low stages as far as Fredericton for vessels drawing 9 feet of water, or just one foot less than the unimproved St. Lawrence below Montreal used to have. Vessels drawing 20 feet can pass the falls at the mouth of the river and a very slight amount of work would make the channel navigable for such vessels for 60 miles. Above the falls there is

ample water for the largest ocean ships for about twenty miles.

Oromocto Shoals

There is but one serious obstruction preventing a 15' channel all the way to Fredericton. This is the Oromocto Shoals situated just above the mouth of the Oromocto River and extending over several miles of channel. The low water depth over the shoals is 9 feet, which limits the draft of vessels going to Fredericton. During the past 45 years the Provincial and Dominion Governments have spent large sums in an effort to open a channel through these shoals, mainly by dredging. The early records, in so far as the writer has had access to them, are very non-committal regarding costs, but it appears safe to say that not less than \$200,000 has been spent on channel improvements at this place. To this might fairly be added a large part of the \$80,000 paid for Dept. of Public Works Dredge No. 12, which was built and placed on the river mainly for the purpose of dealing with the sands at Oromocto. However, in spite of all this expenditure of time and money, no improvement has been effected. Surveys made before any work was undertaken at the shoals show practically the same conditions as exist today in so far as navigation is concerned.

An analysis of the conditions obtaining at Oromocto Shoals will make the reason for this clear. (See Fig. 1). About 25 miles above Oromocto the grade of the river bed suddenly flattens and the valley widens. From this point to Fredericton the river channel is wide and contains numerous islands and bars of sand and gravel. The coarse material carried down by the swift currents of the upper river has all been deposited by the time the water reaches Fredericton. Between that city and Oromocto the river channel is narrower and the flood currents strong and very uniform. No silt is deposited and during rising floods a great deal of fine material is carried over this part of the river. At the head of Oromocto Shoals the river has a cross section of 59,000 square feet when passing a 16-foot flood, while two miles farther down stream the section is 86,700 square feet for the same flood stage. Due to this enlargement of the channel the average velocity is reduced by approximately 30%. The silt carrying power of a river is said to vary as v^3 .

Dredging Increases Silt Deposit

Assuming this to be so, it follows that the average silt transporting power of the St. John is reduced by over 60% in passing over the shoals and consequently a very large part of the fine material brought down from up river is deposited at this place as the current slackens. Obviously any dredging that is done will cause a reduction of velocity and increase the tendency to deposit silt. This is amply borne out by experience, as any channel excavated is filled up very rapidly. Generally the succeeding flood entirely obliterates it.

There is another condition affecting the situation at Oromocto. Normally a river carries most silt while rising and deposits this wherever the current slackens sufficiently. This raises the bed, reduces the section and therefore increases the velocity. Thus the amount of silting up is limited automatically. After the crest of the flood has passed the newly formed bar acts as a submerged dam and the increased current over its crest rapidly wears it away and the river bed is left approximately as it was before the flood.

At Oromocto Shoals the river is divided by Oromocto Island, and Oromocto River enters the navigable or western channel at the lower end of the shoals. (See Fig. 1).

This river has an extensive flood plain near its mouth into which the waters of the St. John flow as the latter stream rises. This creates a lake estimated at 30 to 40 square miles in area which is drained out as the water level in the main river falls. This water discharging into the lower end of the navigable channel, diminishes the amount of water that can be drawn over the shoals from up river and so reduces the amount of scouring that can take place.

Some years ago the district engineer in charge of the river for the Dept. of Public Works prepared plans for improving the river by constructing jetties along Thatch Island. This method seems objectionable in that it would affect only the lower portion of the shoals and would do this by congesting the flow in this part of the river thus slackening the current over the upper shoals and making matters worse there. In any case to remove part of the shoal without arranging for a channel through the rest of it is of no use.

Deeper Channel to Fredericton

To the writer it seems that the only means of permanently improving the channel at this place is to close the eastern channel by a long permeable dike, as shown on the plan. By building this up to an elevation of 4 feet above low water the velocity of current in the navigable channel will be about doubled when the crest of the dike is just awash. The idea in making it permeable is to encourage silting below the dike so that if possible the eastern channel may be permanently closed by the time the life of the proposed dike has expired. After the river has had a couple of seasons to adjust itself to the changed conditions created by the dike it may be necessary to raise its crest by flash boards or otherwise, and it should be designed with this in mind.

The estimated cost of this structure is \$25,000 and with Oromocto Shoals removed such information as is available goes to show that it would not be very difficult to secure a 15-foot channel all the way to Fredericton. The only complete information on the subject is a survey made by the British Admiralty in 1844-46 and in the absence of new surveys it is not possible to give an estimate of the cost of the 15-foot waterway, but apparently a sum not greater than half that already spent at Oromocto would be ample.

When Grand Falls and the other powers are developed it will be necessary to regulate the flow of the river as fully as possible. A very small amount of regulation would raise the lower water flow by two or three feet, so that ultimately a depth of 18 feet or more below Fredericton is quite possible. The development of the water powers of the river will increase manufacturing and this, together with the lumber which at present is shipped by rail or scow to St. John, should provide traffic for the improved waterway.

Economic Conditions

Economically the basin of the St. John may be divided roughly into four districts. First, the upper or forest area, extending from the head of the river to near Grand Falls and including the basin of the Tobique. Much of this division is occupied by the low mountains of the Appalachian range and it constitutes the chief remaining lumber district of the St. John River. Settlements are extending and no doubt will continue to extend for some time as there is much fertile land here, but any colonization schemes for this district should be given very careful consideration before being adopted. The mistakes made in the older parts of the country should not be repeated here.

The forest survey now being made by the New Brunswick Government is a step in the right direction and shows that they are alive to the errors of the past. The fertile and easily accessible tracts should be opened for settlement, but the remainder should be reserved permanently for forests. The lumberman and farmer can be very helpful to each other and a wise colonization policy will bring them together in so far as mutually advantageous.

The second division of the basin extends from Grand Falls to near Fredericton. The surface is gently undulating and the soil in the main is very fertile. Agriculture reigns supreme. Throughout these two upper divisions the river is rapid, non-tidal and has little or no flood plain.

The third district, extending from Fredericton to below the mouth of the Washademoak, is in general quite flat and, except for fertile, alluvial plains along some of the rivers, very indifferent farm land. The upland affords a striking example of mis-managed natural resources. It used to be one of the most magnificent forest regions in the world and the Royal Navies of France and Great Britain used it in turn as a source of supply for masts and yards. The following table is interesting as well for the dimensions of the timber as for the prices paid:—

| | Diameter. Inches. | Length. Feet. | Price. |
|---------------------|----------------------|------------------|------------|
| Yards | 14 to 25 | 66 to 105 | £4 to £ 52 |
| Bowsprits | 25 to 38 | 51 to 75 | 10 to 42 |
| Masts | 18 to 36 | 69 to 108 | 10 to 132 |

When the white man came to the St. John River there were thousands of square miles of virgin forests of white pine and spruce from which trees like the above were cut and which to-day are growing nothing more valuable than gray birch bushes. This result has been accomplished by reckless lumbering, lack of fire protection and an unwise colonization policy. Although the major portion of this land is not suitable for general farming, most of it was granted to settlers who completed the destruction begun by the lumbermen. Many of the farms have been abandoned in whole or in part and except for the more prosperous settlements along the rivers large tracts of the country present an aspect of worthlessness in marked contrast to what its appearance must have been before its resources were destroyed.

The writer remembers one small clump of white pine probably not over two acres in extent which until a few years ago stood on the south shore of Grand Lake near Young's Cove. This small plot had escaped the general destruction and served to show what the soil and climate were capable of. It probably carried a crop of not less than 12,000 f.b.m. per acre of white pine, much of it of first quality.

There are probably not less than 7,000 square miles of land in New Brunswick, not all of it in the St. John Basin, however, now carrying a growth of little or no value which used to be and again could be made just as productive as the little spot mentioned above. This land is not suitable for agriculture, but it is well adapted to silviculture. Indeed, there are few places where conifers grow more rapidly than in the Canadian Maritime Provinces. The abundant rainfall and mild climate seem especially suited to this class of trees.

The writer therefore suggests that the New Brunswick Government take steps to reforest plots in different parts of the province so as to get data on methods and costs and the results to be expected. There are many obstacles in the way of reforesting this area, but it does not appear that they are insuperable. There is an opportunity to add an incalculable amount of wealth to the province and turn large unproductive areas to good account.

There is another class of unproductive land in this part of the St. John Basin which might be made very valuable; namely, those portions of the flood plain which are too badly drained or too low to be of much use under present conditions. There is an extensive area in Sunbury County,

as well as smaller areas elsewhere, of good, firm, alluvial soil of great fertility, which is so ill drained naturally on account of its distance from the regular water courses as to be of little use. They are parts of the bed of the Post-Glacial Lake already referred to and have been unwatered as a result of the combined processes of silting up and draining the lake. Much of this land could be easily drained and made very productive.

In addition to the above land which can be reclaimed by gravity drainage, there is a very considerable area of marshy land which can not be so easily recovered. Some

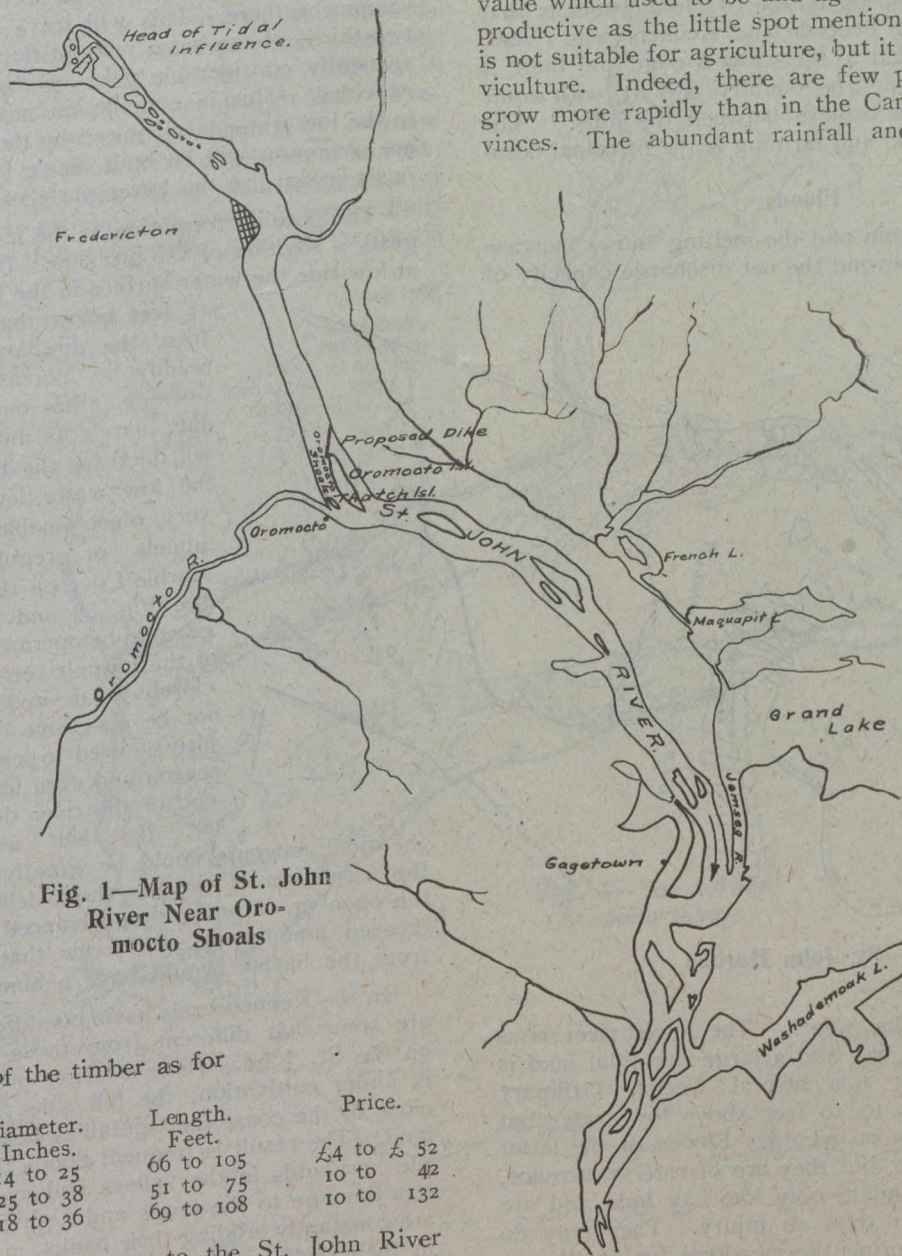


Fig. 1—Map of St. John River Near Oromocto Shoals

of this is producing an inferior quality of hay and some of it is not producing anything of value. In Nova Scotia much low land that used to be considered worthless has been planted to cranberries and is now yielding equal or better returns than the best of their famous fruit lands. These berries are found growing wild along the St. John in numerous places, but the rank growth of other vegetation prevents them from being a success under natural conditions. Whether or not they can be successfully cultivated on the low lands of the St. John is a question that can easily be settled by trial.

The remaining division of the St. John basin is that drained chiefly by the Belleisle and Kennebecasis rivers. High rocky hills extend to the water's edge and there is very little flood plain. The country is hilly with some broad and very fertile valleys between the hills. The soil is everywhere good and farming is the principal occupation.

Floods

Every spring the rain and the melting snows increase the flow of the river beyond the net discharge capacity of

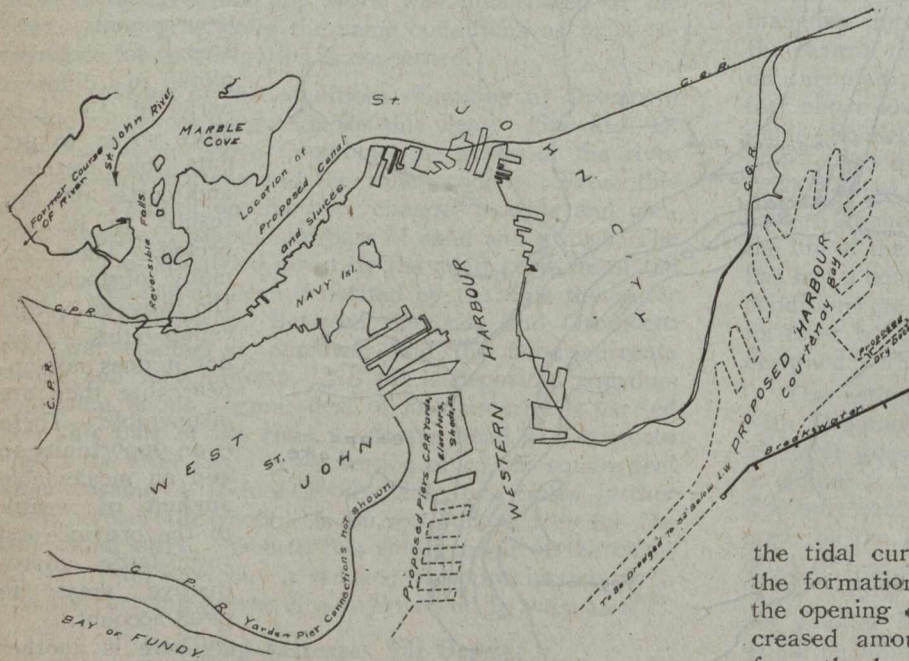


Fig. 2—St. John Harbor

the reversible flow at its mouth. The lower river rises above tide level in the bay and a large non-tidal lake is formed which persists for several weeks. Ordinary spring freshets rise 12 to 16 feet above low water but floods up to 24 feet are on record. Floods of the latter height do much damage, but they are of rare occurrence. The smaller floods inundate only low hay land and are usually a benefit rather than an injury. They may do harm, however, by covering the meadows for too long a period and thus injuring the hay crop. Also during the summer heavy rains sometimes cause the river to rise sufficiently to cover the lower meadows and this is a source of frequent and serious loss. There is another aspect of this matter that calls for attention. When the water powers of the river are developed it will be necessary to regulate its flow as much as possible, and the resultant rise of the low water level will endanger the low lands above referred to. A satisfactory solution of the problem has therefore two objects to attain: First, it must so control the spring freshets as to prevent them from rising to too great a height or remaining on the

meadows for too long, and, second, it must keep the summer water level down as low as possible consistent with navigation and power requirements so that the maximum amount of the low land can be used. The first of these objects can probably be attained by the use of storage reservoirs, but there are as yet no published data on this subject although surveys have been made. It appears, however, that the second object is not likely to be attained by the use of reservoirs. When these are constructed they will doubtless be built above Grand Falls, so that the full benefit may be secured for the power development there. This will leave something more than two-thirds of the basin without flood regulation and consequently considerable rises of the lower river may be expected. This in conjunction with the permanent rise in the low water level caused by the reservoirs, which we are assuming will be built above Grand Falls, will seriously jeopardize the lower parts of the flood plain.

The peculiar formation at the mouth of the river suggests a solution of the problem. It will be recalled that at low tide the water surface in the Bay of Fundy is some 15 feet below that in the river, therefore, the discharge of the water can readily be increased by enlarging the opening it has cut through the natural dam across its mouth. This, however, will increase the tidal variation, reduce the low water level and be generally very objectionable. By cutting short tunnels or regulating sluices from Marble Cove on the river to the harbor (see Fig. 2) and providing these with gates to be operated as needed, the level of the lower river may be controlled as closely as desired and the cost should not be excessive. These sluices could also be used to lengthen the navigation season and even to keep open the lower end of the river during the entire winter. By their use the strength of the tidal currents could be greatly increased and thus the formation of the ice sheet delayed in autumn and the opening of navigation advanced in spring. The increased amount of salt water that could be admitted from the harbor would have a similar tendency.

In the Kennebecasis basin conditions as regards floods are somewhat different from those obtaining elsewhere on the St. John. Here a larger percentage of the land is under cultivation, the hill sides are steep and being close to the coast the rainfall is heavier than farther inland. The result is frequent floods that inundate the fertile low lands in the valleys and every year do more or less damage to the crops and highways. These streams are constantly eroding their banks, making minor changes in their beds and generally causing the farmers trouble and loss as well as frequently wrecking roads and bridges.

Flood Prevention

In the absence of complete and careful studies on the ground it is not possible to prescribe a remedy for this state of things, but evidently detention reservoirs will have to be the main feature of any successful improvement. These may be supplemented by straightening and clearing the channels, bank protection, etc. The reservoirs will have two distinct functions to perform: First, to keep the summer floods off the low lands where they very frequently do great damage to the growing

crops; and second, to so control the larger floods as to prevent them from doing injury. It is true that these major floods may occur when crops are on the low lands, but such an occurrence is rare, and the best that can be hoped for is to neutralize their effects as much as possible. A number of reservoirs in various parts of the world have been built having these dual functions in mind and there appears no reason why they would not succeed on the Kennebecasis, provided satisfactory sites can be found.

Water Powers

The water powers of New Brunswick were investigated by the Commission of Conservation this summer (1918), and pending the publication of its report it is not desirable to discuss them at any length here. Previous reports of the conservation commission estimate the total "low water 24-hour horse power for 8 months, theoretical" for the St. John River and tributaries at about 200,000. They estimate the power at Grand Falls at 120,000, and the following table relating thereto is copied from their report:—

| Year | Max. | Min. | Mean | DISCHARGE IN C.F.S. | | Total Yearly run-off in ins. on drainage area |
|------|---------|-------|--------|---------------------|-------|---|
| | | | | per sq. mi. | Mean | |
| 1908 | 83,840 | 1,300 | 13,047 | 1.576 | 21.48 | |
| 1909 | 103,120 | 1,675 | 14,691 | 1.774 | 24.46 | |
| 1910 | 38,400 | 1,525 | 9,987 | 1.206 | 14.99 | |

The power is very easy of development and the initial cost per h.p. should be very low. Regarding storage for river regulation there are no large lakes, but there are a considerable number of small ones, chiefly in Maine. The International Commission pertaining to the St. John has collected a lot of data on this and kindred subjects but their reports have not yet been published. Another disadvantage of the Grand Falls power site is its distance from any large centre of population. St. John is 145 miles and Quebec city

160 miles away. Cheap power, however, always attracts industries. The experience of the Ontario Hydro-Electric Commission is a striking instance of this. The following table shows the growth of their output since organization:—

| Horse-power. | |
|--------------|---------|
| 1910 | 8,000 |
| 1911 | 12,000 |
| 1912 | 28,700 |
| 1913 | 50,470 |
| 1914 | 82,161 |
| 1915 | 110,654 |
| 1916 | 150,000 |
| 1917 | 205,000 |
| 1918 | 250,000 |

The present time seems most opportune for placing the New Brunswick Water Powers under a commission

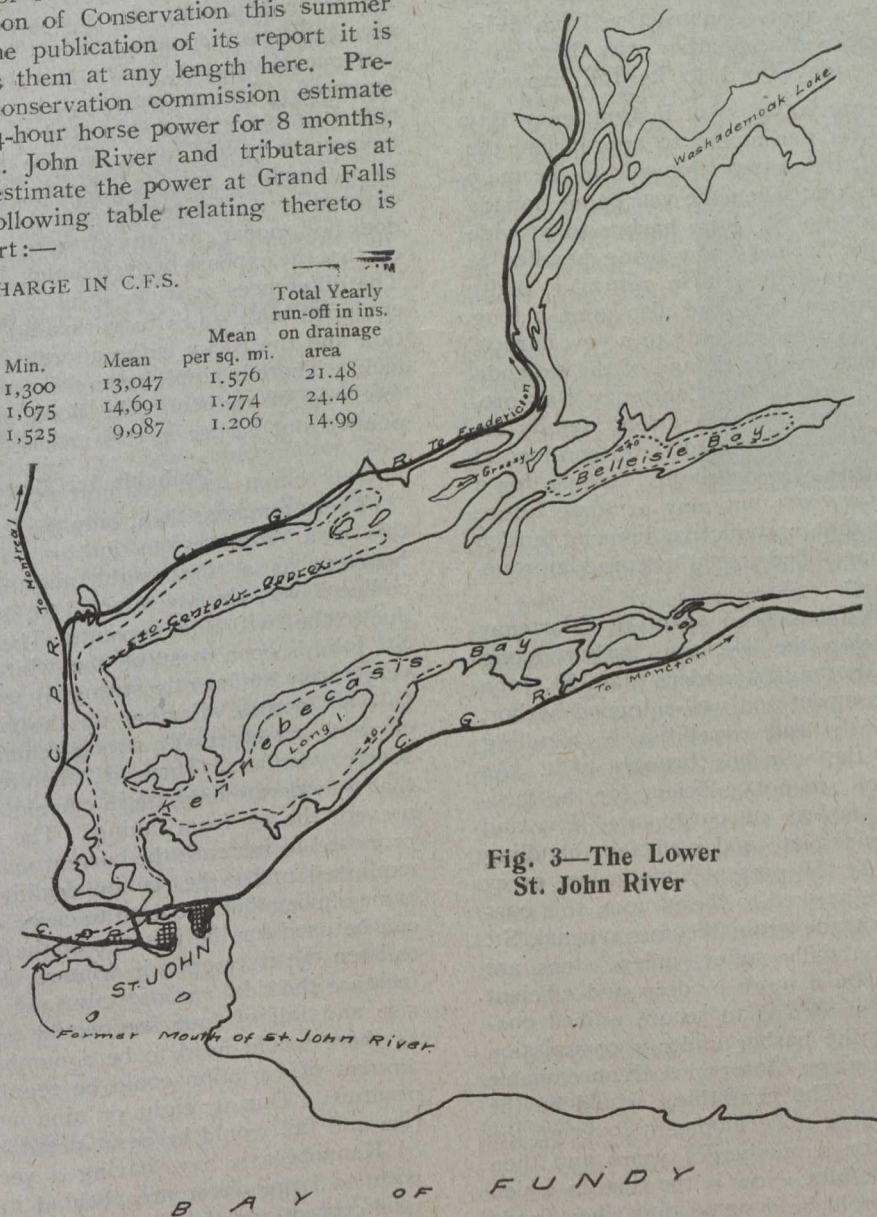
similar to that which is so efficiently managing those in Ontario. The fuel shortage and the increased demand for power caused by the war make it desirable to develop all the hydro-electric energy for which there is a market in sight. Moreover, practically all of New Brunswick's powers are as yet unharnessed, and it should therefore be possible for the commission to secure practically a clear field and to develop these powers in such a way that the public may get the full benefit therefrom.

St. John Harbor

St. John city ranks second among Canadian ports in the total of its imports and export trade, being surpassed only by Montreal. Its total trade for the fiscal year 1917 is given as \$206,087,220. It has a shorter rail haul to and from the Canadian interior than any other ice free port in Eastern Canada. Its harbor is easy of entrance, open the whole year round and never affected by ice. From it, steamship lines run direct to the United Kingdom, Europe, South Africa, New Zealand, Australia, West Indies, and United States ports.

St. John harbor is a striking example of the evils of divided control, and development proceeding without a comprehensive and carefully worked out plan. The present harbor facilities are the results of the activities of the C.P.R., the city and the Dominion Departments of Public Works, Railways and Canals, and Marine and Fisheries,

Fig. 3—The Lower St. John River



each acting more or less independently of the rest. As usual under such conditions, the more energetic and efficient organization secured the best that was going regardless of the needs of the others or the best interests of the port as a whole.

The C.P.R. and the Harbor

However, in partial justification of the C.P.R.'s hold on St. John harbor, it must be confessed that most of the port's sea borne traffic is handled by that road to and from the west, therefore it is perfectly proper that most of the ocean terminals should be placed where most con-

venient for that road. It does not appear, however, that it was necessary to extend these piers so far into the harbor as has been done. They are carried out to such a length as to prevent the building of any piers on the opposite side, and being of the solid fill type they have had a very bad effect on the strength of the naturally troublesome tidal currents. The accompanying plan shows the above features and also the proposed work at Courtenay Bay. This work was placed under contract a number of years ago and carried on until 1915, when it was discontinued. At the time the work in Courtenay Bay was initiated, it was expected to provide for the business to be brought to the port by the National Transcontinental Railway, then under construction from Winnipeg to Moncton. The western harbor was then, as it still is, far from being developed to its full capacity.

While huge sums were being spent in Courtenay Bay it was not possible to get parliament to appropriate the money for the urgently needed improvements in the main harbor. The result was that when the war came Canada had spent enough money on St. John harbor to provide adequate facilities for the business now being handled at a great disadvantage and had got in return a badly equipped, half developed port and had also gone a long way to making what practically amounts to a new harbor, but was not in a position to realize on any of the expenditure therein incurred. In short the Courtenay Bay project, like the Quebec bridge, bears a strong family resemblance to its parent, the National Transcontinental Railway. They each provide at enormous expense for a need which does not now exist but may at some future time arise, and each, by the unproductive financial burden placed on the country, has stifled urgently needed improvements.

Had the money which has been spent in Courtenay Bay been used to develop the western harbor along the lines of a complete, thoroughly modern plan, St. John would now have had a compact and well-equipped harbor, fully capable of efficiently and expeditiously handling the great traffic which the war has brought to it. As it is, the accommodations are not sufficient for the business being handled. Transfers of cargo are slow and expensive, due to the inadequate and inefficient handling and storage facilities. At the present time, when every ton of shipping should be worked to the utmost, this condition is serious. When trade again becomes normal, St. John business will undoubtedly suffer, unless steps are taken to put the harbor on a more modern and efficient basis. Obviously the first step is to secure unified control, possibly by placing the harbor under a commission similar to that which has given Montreal such an enviable position among seaports. The next thing would be the preparation of a general plan of development covering the port's estimated needs for a number of years and then the working out of the details. Now is the time in which this preliminary work should be done so that when funds become available they may be employed in such a way as to give the public the maximum of value for every dollar spent.

A Great Land-Locked Harbor

Any discussion of St. John harbor would be incomplete without a reference to the magnificent sheet of deep water forming the lower portion of the river (see Fig. 3). Here is a body of water having a minimum depth of 40 feet for an area of some 70 square miles, absolutely protected from storms and having a tidal range of not over two feet as compared with nearly 30 feet in St. John harbor. While many seaports having a large tidal range have at

great expense provided themselves with tideless basins, nature has given St. John such a basin and on a mammoth scale. Here at Canada's eastern gateway is a land-locked harbor large enough to house safely the navies of the world and fully adequate to the great commercial career upon which we believe we are entering. As a naval base it would appear to have very strong claims to consideration. It has room for an unlimited number of industrial establishments and as the accompanying plan shows has already very good railroad connections.

There are, however, certain natural obstacles which must be overcome before it can be utilized as a harbor for ocean shipping. It is separated from the ocean by a ridge of rock some 1,500 feet wide with a difference in water level varying, for normal river stages, from a maximum of 15 feet in one direction to nearly 12 in the opposite direction. It is subjected to an annual flood rise of from 10 to 14 feet, while on rare occasions it may amount to as much as 20 feet. Lastly, it is wholly or partially covered by ice for several months each year. However, it does not appear that any of these obstacles are insuperable or that the expense of overcoming them will be excessive. The differences in water level can be overcome by a lock equipped with gates to withstand a head in either direction and the rocky ledge affords an excellent site for the lock. There is ample room for any number of locks. The methods of reducing the flood rise have already been pointed out earlier in this article.

Probable Ice Conditions

There remains, then, only the ice to be disposed of and this is a more serious matter. However, it is not so hopeless as at first sight might appear. The Petitcodiac River, already referred to, is entirely free from ice, due to the swift tidal currents. The lower ten miles of the St. John is open most of the winter and the ice there is very rarely sufficiently strong to render it safe for a man to walk across. Farther up the river, places where the currents are especially strong remain open except in very severe weather. There is, therefore, reason to believe that a moderate increase in current velocity would entirely prevent the ice from taking. The method by which it is proposed to increase the current velocity has already been explained under the section dealing with floods, and the same sluices that are used to carry off the floods in spring can be used for the passage of the tidal waters which are to keep the river open in winter. It is true that this will increase the tidal variation, but not to a serious extent. A rise and fall of four feet would probably be ample and as there would need to be a number of sluice gates the amount of variation could be regulated to suit the temperature. During eight or nine months of the year the rise and fall would be as at present.

Kennebecasis bay, having a very large cross section with no large water area behind it, has a very sluggish tidal current and the above scheme would have little effect on its conditions, but there is ample deep water area without it. In the main river, conditions are just the opposite, Up stream from that part of the river which we are now considering, there are large areas of tidal water which must be raised and lowered at each tide, thus ensuring strong currents in the lower reaches of the river. If the increased strength of current should be unequal to the task of keeping the ice from taking, a small ice breaker could be used.

Another feature of this proposal that needs consideration is the strength of the currents in the present harbor at the entrance to the proposed canal. At times when the sluices are being operated, either to carry off more

quickly the flood waters of the river or to prevent ice from forming thereon, the currents in the present harbor will be stronger than they are now. In order to reduce these as much as possible and also to improve the entrance to the canal it may be necessary to dredge away Navy Island and the adjacent shoal in part or even altogether.

Summary

The matters advocated in this article are as follows:—

1. The abandonment of the attempt to dredge a channel through Oromocto Shoals. That plan has been tried and found wanting for 40 years. The adoption of the scheme outlined in this paper, unless something better can be devised, so that a 15' waterway may be obtained all the way to Fredericton. Later this depth may be increased several feet, if the extra expense seems warranted.

2. The initiation of a policy of reclamation for the waste lands of New Brunswick, by reforestation, by drainage or in whatever way the special circumstances render most suitable. Such a policy if carefully developed and wisely and efficiently administered can add an enormous amount to the wealth of the province.

3. The preparation of plans for flood control along the lines suggested in this paper.

4. The formation of a New Brunswick hydro-electric commission to take charge of the water powers of the province and develop them as fast as the public interest will warrant. (Since writing the above, information has been received that a beginning has been made in this matter and that the next session of the New Brunswick Legislature will likely create a commission for the province similar to the Ontario Hydro-Electric.) Proposals 2, 3 and 4 of this summary are very closely related and depend for their complete success upon the adoption of a broad general policy covering a long period of time. To subject any of them to the violent reversals of policy likely to occur under our system of party government would be to seriously jeopardize their success and it therefore would probably be better to place all these matters under one commission and keep them entirely outside of politics.

5. That the port of St. John be put in the hands of a commission of the ablest men that can be secured, so that a modern and comprehensive plan of development may be worked out, and it is suggested that the scheme for the utilization for harbor purposes of the large, nearly tideless area of deep water in the lower reaches of the St. John River is worthy of very serious consideration.

CORRECTION

IN the November 21st issue of *The Canadian Engineer* it was erroneously stated that the firm of DuCane, Dutcher & Co., consulting engineers, of Vancouver, B.C., had changed the name of their firm to the General Engineering Company. H. K. Dutcher advises us that the name of DuCane, Dutcher & Co. remains unchanged, although they are forming another company for certain fields of work, particulars of which will be announced later.

The Chicago office of the Electro Bleaching Gas Company, of New York, which has been temporarily closed on account of the war, is to reopen, and will be in charge of G. R. Ellis as formerly. It will be located at 11 La Salle Street as heretofore.

RIVERSIDE DRIVE SEWER, CLEVELAND

THERE is now being completed in Lakewood, a suburb of Cleveland, a \$90,000 main sewer on beautiful Riverside Drive. This sewer is 7,000 ft. long and consists of two lines, one directly above the other. At the outlet, the lower line is 24-in. vitrified clay pipe and the upper, 27 in. Where connection is made with the existing sewer system, this lower line is 18 in. and the upper, 24 in.

The trench is 3 ft. wide by 15 ft. deep. Starting at the lower end—the outlet—the top 1½ ft. is hard, baked clay and the underlying 13½ ft., solid shale, which required three blasts of dynamite to condition for digging. At the upper end, there was 9 ft. of clay and 6 ft. of shale.

To cut this trench, the contractors used a steam shovel equipped with a 30-ft. dipper stick. Working 5 hours daily, this shovel averaged 50 lineal feet, or 83 cubic yards. The contractors figure it replaces 30 laborers, as they calculate that a man in this material, and under the existing conditions, would do well to dig 2½ cubic yards in a half a day.

Pipe is laid by sections; that is, the shovel digs a certain amount of trench, then the layers follow with the pipe. The shovel back-fills the trench (see illustration) with dirt taken from the front. In other words, 50 lineal feet of this double sewer is completed in a 5-hour day. But for the fact that the shovel both digs and back-fills the trench and is handicapped by the pipe-laying operations, it would deliver even greater yardage. The length of the dipper stick permitted casting the surplus excavation over the river bank.



Gas-producing companies, distributing companies and gas consumers from urban and rural municipalities were represented at meetings held last week at Chatham, Ont., pursuant to a call issued by the Ontario Government for a meeting at which names might be suggested for membership in the new Natural Gas Commission, which will advise with the government as to future legislation concerning the production and distribution of natural gas in Ontario. E. R. Gray, city engineer of Hamilton, Ont., is one of the three nominees for urban representative.

Speaking last week at the meeting of the Hydro-Electric Railway Association of Ontario, Sir Adam Beck, chairman of the Hydro-Electric Power Commission, issued a public warning to manufacturers of electrical machinery that "if they do not keep within bounds, they will meet with competition," intimating that the Commission may go into the business of manufacturing supplies and equipment. He did not charge the manufacturers with having formed a combine, but hinted at a "gentleman's understanding." Before the war, he declared, there was as much as 25 per cent. difference in tenders, but not now. When tenders were opened recently on a \$26,000 contract, he said, the difference between the highest and lowest of five tenders was only \$8.60.

Letter to the Editor

Detecting Leaks in Underground Pipes

Sir,—I was interested in the paper by David A. Heffernan before the New England Waterworks Association on the above subject, a copy of which appeared in your issue of November 28th, for the reason that it covers some of the ground which I have frequently metaphorically travelled over. There are two or three points to which I would like to refer.

Mr. Heffernan stated that "it is a matter of patriotism for every superintendent to use every means at his disposal to combat the wasteful and needless use of water." Much is being urged in the name of patriotism, but why stop there? Good and efficient administration of waterworks at all times and under all conditions is the best form of patriotism. Patriotism is a permanent virtue and needs to be always kept before the public, both individually and collectively. It is an excellent motif for public authorities to prevent public money being spent on supplying water which is being misused. No merchant would prosper for long if he allowed leaks to continue unchecked in his business, and he only endeavored for patriotic reasons to reduce them to a minimum. The prevention of waste is good business.

"The responsibility for this waste lies in two places, with the consumer and distributor." I would be disposed to place the distributor first because he is furnishing the supply that is being misused, and he has the power and authority to prevent waste and he is the trustee of the public welfare, whereas the consumer disregards the common good and is evidently callous to waste; why, therefore, should he be permitted to receive the same consideration as a frugal consumer?

A waterworks system is not complete without the means of knowing what quantity of water it supplies at all hours and how it is being used. Electric and gas departments always have ample equipment for ascertaining the quantity of electricity generated or gas manufactured and delivered. Daily records are kept throughout the year and the cost of production is easily arrived at. In short, practically all electric and gas departments are operated on up-to-date business lines, even in small towns and villages. But waterworks are more often operated with a strange conception of efficiency. The records of the Ontario waterworks, as published in the annual reports of the Ontario Railway and Municipal Board, will show that the business-like care of electric and gas departments is not always evinced in the waterworks department. We could live without electricity or gas but not without water, and yet the service we want most is abused the greatest.

With a satisfactory bulk or district meter it is possible to make frequent surveys of the area supplied and to find out what is occurring there. Inspectors should make periodical visits to houses and premises to examine the water fittings, and here I would like to refer to the need for standard quality of fittings. There is good reason to believe that the taps, tanks, pipe, etc., in the houses are not what they should be. A house is being erected, plumbers are asked to quote, and as a measure of competition they have to install equally cheap fittings or lose the job, whereas if standard designs, weights and qualities were fixed by the authorities, plumbers could then put in proper fittings. Electric fixtures have to comply with

regulations because of the element of fire. Why not regulate for waterworks fixtures as a function of health preservation. Where individual meters are installed the consumers will soon learn that cheap water fittings are not good investments.

It is satisfactory to note that waste in all its phases is being carefully considered and discussed. Engineers are interested in the subject, for it is one of their functions to design, construct, produce and administer efficiency.

R. O. WYNNE-ROBERTS

Toronto, Ont., November 29th, 1918.

DEVELOPMENT OF CONCRETE ROAD CONSTRUCTION*

By A. N. Johnson

Consulting Engineer, Portland Cement Association

IF a proper understanding is to be had as to why a particular type of road should have come but recently into common use, the general development of highways must be at least briefly considered. We will, therefore, touch first upon some of the broader economic aspects of the development of roads in general and the manner in which these economic conditions have affected the use of concrete as a road surfacing material.

The outstanding fact of recent highway development is the immense increase of motor traffic. As will be seen by the following table, showing the registration of motor vehicles in the United States, the number has increased from about 48,000 in 1906 to more than 5,000,000 in 1917.

Automobile Registration in the United States

| Year. | Number. | Year | Number. |
|-----------|---------|-----------|-----------|
| 1906..... | 40,000 | 1912..... | 1,013,975 |
| 1907..... | 85,000 | 1913..... | 1,258,062 |
| 1908..... | 120,000 | 1914..... | 1,711,339 |
| 1909..... | 250,000 | 1915..... | 2,445,664 |
| 1910..... | 300,000 | 1916..... | 3,512,996 |
| 1911..... | 710,000 | 1917..... | 5,148,063 |

It has been estimated that in 1915 the railroad passenger trains produced 30,000,000,000 train passenger miles, while the motor vehicles produced 45,000,000,000 passenger miles. When we take into account the fact that there were but little more than 50 per cent. as many motor vehicles registered in 1915 as in 1917, we begin to gain some faint idea of the enormous increase and vast proportions of this new traffic upon our highways.

The problem is a growing one and one that has gone far beyond all precedents. Past experience affords but slight foundation upon which to plan for the future. If adequate highways are to be built for to-morrow's traffic, the highway engineer must be possessed of vision as well as the courage which will make him ready to abandon those methods of construction which we have now outgrown, although of long standing.

The most important factor in connection with motor traffic is the possibilities that lie before us in the extended use of the motor truck. Almost daily we have brought to our attention new and remarkable accomplishments.

Time will not permit us to dwell at this point upon what must be seen clearly as the outcome of our changed traffic conditions. This is the absolute inadequacy of our

*Excerpts from one of the "J. E. Aldred Lectures on Engineering Practice" at Johns Hopkins University.

method of road administration by small political units. To-day's traffic demands long stretches of expensive road construction, wholly beyond both the financial and administrative capacity of the individual township or the small county to undertake. While this is a feature that must be understood and studied by every highway engineer, it must be passed over without further mention to take up those changes in methods of construction which have been imposed upon the highway engineer by this new use of the road.

New Traffic Conditions

With vehicles of greatly increased weights, with self-contained motor power, moving at seven to ten times the speed of heavy horse-drawn traffic, it is not to be wondered at that many of the older type of highway surfaces have proven themselves to be utterly incapable of the service which they are now called upon to perform. The effects of the self-propelled vehicle upon a road surface are quite different from those of the horse-drawn. While the latter tended to compact and keep in place the particles of the macadam or gravel surfacing, which had been found entirely adequate for this type of traffic, the wheel of the self-propelled vehicle tends to dislodge them. It depends upon the stability of the road surface not alone to afford sufficient resistance by which the vehicle may be propelled, but also sufficient stability to withstand the much greater impact due to heavier loads at greatly increased speeds. It is clear only those types of surface which afford the utmost rigidity and resistance to displacement can meet the requirements. Thus it is seen that the new traffic, by imposing these requirements, has enormously increased the cost of highway construction if such construction is to be of a type that can give the service that modern conditions demand.

Increase in Yardage

The concrete road has become in the past few years well known throughout the country, as the great increase in the yardage of this type of pavement will bear witness. The following table and diagram show that while prior to 1909 there had been constructed but 591,416 square yards of this type of pavement, there had been laid at the close of 1917 a total of nearly 97,000,000 square yards.

Table Showing Yardage of Concrete Roads, Streets and Alleys Built in the United States, by Years

| Year | Sq. Yards Roads | Sq. Yards Streets | Sq. Yards Alleys | Sq. Yards Total |
|-------------------|-----------------|-------------------|------------------|-----------------|
| Prior to 1909.... | 34,061 | 444,864 | 112,491 | 591,416 |
| 1909.... | 32,626 | 325,158 | 86,825 | 444,609 |
| 1910.... | 151,148 | 682,637 | 107,874 | 941,659 |
| 1911.... | 291,077 | 1,011,440 | 136,674 | 1,439,191 |
| 1912.... | 1,869,486 | 3,326,029 | 185,703 | 5,381,218 |
| 1913.... | 3,339,185 | 3,946,219 | 308,365 | 7,593,769 |
| 1914.... | 10,608,421 | 4,830,604 | 300,138 | 15,739,163 |
| 1915.... | 12,050,909 | 5,933,879 | 612,921 | 18,597,709 |
| 1916.... | 15,841,656 | 7,497,120 | 880,179 | 24,218,955 |
| 1917.... | 15,222,087 | 5,228,062 | 1,200,030 | 21,771,179 |
| | 59,551,656 | 33,236,012 | 3,931,200 | 96,718,868 |

The following tables will be of help in making estimates for concrete roads of various widths and thicknesses. It is to be noted that the 9 and 10 foot widths are given as half the quantities for 18 and 20 foot width roads on the assumption that the narrower widths are laid at one side and are subsequently to be widened to full width.

Areas of Cross Section, Cubic Yards per Linear Foot, and Square Yards of Surface for Concrete Roads for Various Widths and Thicknesses

| Width Feet | Sides Inches | Thickness Center Inches | Average Inches | Area of Cross section Square feet | Cubic yards per linear foot of pavement | Sq. yds. per mile |
|------------|--------------|-------------------------|----------------|-----------------------------------|---|-------------------|
| 9 | 6 | 8 | 7.33 | 5.50 | .204 | 5280 |
| 10 | 6 | 8 | 7.33 | 6.111 | .227 | 5867 |
| 18 | 6 | 8 | 7.333 | 11.000 | .407 | 10560 |
| 18 | 7 | 9 | 8.333 | 12.500 | .463 | 10560 |
| 18 | 8 | 10 | 9.333 | 14.000 | .519 | 10560 |
| 20 | 6 | 8 | 7.333 | 12.222 | .453 | 11733 |
| 20 | 7 | 9 | 8.333 | 13.777 | .510 | 11733 |
| 20 | 8 | 10 | 9.333 | 15.555 | .576 | 11733 |
| 24 | 6 | 8 | 7.333 | 14.667 | .543 | 14080 |
| 24 | 7 | 9 | 8.333 | 16.667 | .617 | 14080 |
| 24 | 8 | 10 | 9.333 | 18.667 | .691 | 14080 |
| 26 | 6 | 8½ | 7.667 | 16.611 | .615 | 15253 |
| 26 | 7 | 9½ | 8.667 | 18.777 | .695 | 15253 |
| 26 | 8 | 10½ | 9.667 | 20.944 | .776 | 15253 |
| 27 | 6 | 9 | 8.000 | 18.000 | .667 | 15840 |
| 27 | 8 | 11 | 10.000 | 22.500 | .833 | 15840 |
| 30 | 6 | 9 | 8.000 | 20.000 | .741 | 17600 |
| 30 | 8 | 11 | 10.000 | 25.000 | .926 | 17600 |
| 36 | 6 | 9½ | 8.333 | 25.000 | .926 | 21120 |
| 36 | 8 | 11½ | 10.333 | 31.000 | 1.148 | 21120 |
| 40 | 6 | 10 | 8.667 | 28.888 | 1.070 | 23467 |
| 40 | 8 | 12 | 10.667 | 35.555 | 1.317 | 23467 |

Quantities of Materials Required per Linear Foot of Concrete Roads for Widths and Thicknesses Shown

Quantities based on 1 barrel cement, equal to 4 cu. ft. and that voids in stone average 45 per cent. Adapted from quantities as given by Taylor & Thompson for 1 cu. yd. concrete.

| Width Feet | Sides Inches | Thickness Center Inches | Cement | | Sand | | Stone | | Rock or Pebbles | |
|------------|--------------|-------------------------|----------------|------------------|-----------------------------|----------|--------|--------|-----------------|--|
| | | | bbls. | cu. yds. | cu. yds. | cu. yds. | 1:2:3 | 1:1½:3 | | |
| | | | 1:2:3 | 1.74 | 1:2:3 | 0.52 | 1:2:3 | 0.77 | | |
| | | | 1:1½:3 | 1.91 | 1:1½:3 | 0.42 | 1:1½:3 | 0.85 | | |
| | | | Cement Barrels | Sand Cubic Yards | Rock or Pebbles Cubic Yards | | | | | |
| | | | 1:2:3 | 1:1½:3 | 1:2:3 | 1:1½:3 | 1:2:3 | 1:1½:3 | | |
| 9 | 6 | 8 | .355 | .389 | .106 | .086 | .157 | .173 | | |
| 10 | 6 | 8 | .394 | .433 | .118 | .095 | .175 | .193 | | |
| 18 | 6 | 8 | .708 | .777 | .212 | .171 | .313 | .346 | | |
| 18 | 7 | 9 | .806 | .884 | .241 | .194 | .357 | .394 | | |
| 18 | 8 | 10 | .903 | .991 | .270 | .218 | .400 | .441 | | |
| 20 | 6 | 8 | .788 | .865 | .236 | .190 | .349 | .385 | | |
| 20 | 7 | 9 | .887 | .974 | .265 | .214 | .393 | .434 | | |
| 20 | 8 | 10 | 1.002 | 1.100 | .300 | .242 | .444 | .490 | | |
| 24 | 6 | 8 | .945 | 1.037 | .282 | .228 | .418 | .462 | | |
| 24 | 7 | 9 | 1.074 | 1.178 | .321 | .259 | .475 | .524 | | |
| 24 | 8 | 10 | 1.202 | 1.320 | .359 | .290 | .532 | .587 | | |
| 26 | 6 | 8½ | 1.070 | 1.175 | .320 | .258 | .474 | .523 | | |
| 26 | 7 | 9½ | 1.209 | 1.327 | .361 | .292 | .535 | .591 | | |
| 26 | 8 | 10½ | 1.350 | 1.482 | .404 | .326 | .598 | .660 | | |
| 27 | 6 | 9 | 1.161 | 1.274 | .347 | .280 | .514 | .567 | | |
| 27 | 8 | 11 | 1.449 | 1.591 | .433 | .350 | .641 | .708 | | |
| 30 | 6 | 9 | 1.289 | 1.415 | .385 | .311 | .571 | .630 | | |
| 30 | 8 | 11 | 1.611 | 1.769 | .482 | .389 | .713 | .787 | | |
| 36 | 6 | 9½ | 1.611 | 1.769 | .482 | .389 | .713 | .787 | | |
| 36 | 8 | 11½ | 1.998 | 2.193 | .597 | .482 | .884 | .976 | | |
| 40 | 6 | 10 | 1.862 | 2.044 | .556 | .449 | .824 | .910 | | |
| 40 | 8 | 12 | 2.292 | 2.515 | .685 | .553 | 1.014 | 1.119 | | |

The Works Commissioner of Toronto has reported against the installation at present of a new sewage disposal plant, stating that experiments are being made.

MINISTER PROPHECIES ACTIVITY

(Continued from page 488-b)

Never in the world was there such a shortage of food as at present, and food prices must rule high for another year. This plays an important part in the prices of building materials and of everything else.

The enhanced cost of construction to-day is undoubtedly a deterrent to those wishing to engage in construction. I am not going to offer to you the solution of this problem to-day, if indeed it should ultimately prove to be a problem. I understand that you have formed certain committees to discuss these problems and I trust that arrangements will be made for various members of the government to meet your committees and receive any viewpoints that you may have as to how these problems may be solved. Everyone should assist in the solution of the many problems facing us to-day.

"In the building program," declared Mr. MacLean emphatically, "I have no hesitation in saying that governments, provincial and local, municipalities, cities and towns which have deferred construction programs should resume them at once.

"There is no restriction to-day upon the issue of securities by any government whatever, provincial or municipal, so that these representative bodies are at liberty

to go into the money markets and procure their money for construction programs, and it is the duty of all representative bodies to give a lead to the people of Canada at this moment when things are more or less confusing."

During the war we learned the value of standardization, economy, co-operation, organization and up-to-date machinery, and all that was very much needed in this country. It cannot be said that our industries were subject to criticism for lack of these forces before, for we were a very young country and we cannot look for such factors to be very prominent in the life of a young country, but if these factors which contributed so much to our war industries, be applied to the industries of peace, we cannot but benefit therefrom. I think that we might possibly absorb a great deal of the enhanced cost of construction to-day, which is more or less of a hindrance to many people in engaging in construction work to-day, by the increased efficiency and the better methods that we have learned during the war.

"We learned how to run the war while we were waging it," concluded Mr. MacLean, "and we will learn how to meet and solve our problems as the days go by, and particularly if we make up our minds that we are going to meet them successfully; and having our minds made up to that, I am sure that the future can be regarded as most hopeful and bright by everybody."

Minister of Public Works Says It Is Government's Duty to Branch Out In Building Program

REFERENCE having been made by the chairman to the fact that the Hon. Frank Carvell, Minister of Public Works, is interested in a brick manufacturing plant and therefore might be considered a member of the Association of Canadian Building and Construction Industries, Mr. Carvell carefully stated that he was not talking as a brick manufacturer when he addressed the members of the Association last Wednesday at their luncheon.

"I occupy an illogical position," said Mr. Carvell, "as I am a lawyer, and a lawyer ought to be the last man to know anything about building."

We have come now to the reconstruction period. The fact that nearly two hundred men of this Association have come here to this conference shows the seriousness of the problems in which the country is interested even more than the Government. At no previous time have we faced such great problems. Our debt has doubled and we must raise great revenues. With our enormous resources we will pull out all right, and in a year or two we will go on and grow much greater than ever before. The Government should not throw the responsibility entirely on the people, nor should the people "pass the buck" altogether to the Government.

I understand that housing has been discussed by your conference. This is a question of policy. The Government must decide this matter as a question of principle. My field is public works. Many people have asked me, "what do you propose to do to tide the country over the reconstruction period?"

For the past year we have been putting on the brakes as hard as we could, endeavoring to save all our money for war purposes and not to spend money otherwise. Now that the war is over we look at the question of public expenditures from an entirely different standpoint.

The Government is justified and is called upon to spend money on any work of economic advantage, even if the cost should be increased. We must have a much broader outlook during the coming year than we have had for the past two or three years from a building trades standpoint.

The provision of office space for the Government is a problem in every city. The amount we are paying for rented buildings throughout the Dominion is staggering. We are paying \$700,000 a year to the landlords in Ottawa alone. This shows the necessity of publicly-owned buildings. In nearly every city throughout the country we are paying in rentals much more than the interest and depreciation would amount to on suitable buildings erected for our own purposes. We cannot base the requirements exactly upon present conditions, however, as some of the officials and departments of the Government will cease to exist now that the war is over.

In practically all cities in Canada we should have our own buildings, and this will mean a large building program if the idea is adopted. We are giving it serious consideration. There will also be other public works that will employ labor.

It is our duty to branch out in a building program; our duty to see as many men as possible be employed until we get back to normal, even if such building is going to cost more money than during normal times; yes, even if it is going to cost quite a lot more money, in order to tide over the reconstruction period.

I see that you have also been discussing the question of letting public works by tender. I am a firm believer in this principle, and since becoming Minister of Public Works there have only been two contracts in that department that have not been let by public tender and to

the lowest tenderer. This has always been a hobby of mine.

From a contractor's standpoint I suppose you would say that the work had better be divided around. Personally I would like to see more of it handed out to everyone in the country and to see the work well distributed, if I thought it were good business to do so.

All Government work should be let by contract. When given out on force account the workmen get that easy Government feeling, that comfortable feeling that they are working for the Government. If anybody can show me how to correct that feeling and to make the men see that they should work with more than ordinary energy because they are working for the Government, then I would change my policy.

Now I have discussed the policies of the Government as much as I can. You must remember that it is only two weeks since the armistice was declared. We have reached no concrete decision of policy, and no individual member of the Government can lay down matters of policy beforehand, but I have simply been stating what has been running in my mind, namely that as much work as possible should be done and that as much labor as possible should be employed.

With the closing down of munition industries there will be much unemployment unless we put our shoulder to the wheel and furnish opportunities for labor. There is nothing worse for a country than lack of work and charity. It unmans and unnerves the recipient of the charity.

There may be certain times and certain communities when and where men cannot get work, and plans will have to be made to ameliorate any such condition to the greatest degree possible.

It is the individual duty of every manufacturer and of every employer of labor,—these things are as much his duty as the duty of the Government—to see that men are employed, and to take on contracts and work at less profit than ordinarily, and to think not too much of profit in order to tide all over this period.

We must realize the difficulties in way of construction work during the next year and possibly two years. To begin with there is the cost of labor. This is based on the cost of living, which is abnormally high. The cost of labor cannot go down until the cost of living goes down, and the cost of materials and building depend on labor.

The cost of building is now higher than it has ever been in the life-time of any of us, but is really not abnormally high compared to what goes into a building. If the materials cost 50% more and the labor 50% more, we must surely expect to pay the contractor 50% more for the building.

We must not find too much fault with labor until the cost of living goes down. By next spring it will probably go down, but pretty slowly. Because of these things it is our duty to employ as many as we can, and at as good a wage as possible, in order to tide us over this serious state of affairs.

It is good of you men to have come together to play your part in the solution of these problems.

Minister of Labor and Head of Labor Congress Discuss "Joint Control" of Industry

SENATOR G. D. Robertson, the new minister of labor, told the members of the Association of Canadian Building and Construction Industries last week at Ottawa, that he feared that he had taken over the Labor Department at a period when the work of that Department would be more than ordinarily difficult. Senator Robertson was the chief guest of honor at the luncheon held last Thursday.

"Intensive efficiency will be needed to compete in foreign markets," said the Senator; "efficiency on the part of both employees and employers. That this efficiency should be attained is desirable from the standpoint of all interests concerned."

Negotiation By Trades

There has been a labor unrest during the past couple of years because as supplies grew scarcer and the cost of living increased, the workman required an increase in his wages, but there was no uniformity of action by the laborers as a whole nor by their employers. Had they all been able to sit down trade by trade and negotiate, it would have tended greatly to contentment in all lines.

If it were possible for the employers to meet with duly accredited representatives of labor and to sit down and agree regarding rates of pay to be adopted in a given territory, we would start out on the season's work to the advantage of all concerned. This would be very preferable to a continuation of the present discontent caused because one employer is paying a little more than another, thus causing dissatisfaction throughout a whole industry and tending to impair the efficiency of all.

By co-operation between the provincial governments and municipalities, something should be arranged to provide more comfortable and sanitary homes at a rental or purchase price within the means of the workmen.

If the soldiers return and find it impossible to obtain a reasonable home, it will add greatly to their discontent. They will expect to be able to maintain their families in the same condition as previous to the war and will see no reason why they should not be able to do so, and this condition should be met by a supply of comfortable, sanitary homes within their reach. It must be done by the assistance of the state, both federal and provincial. All members of the Association of Canadian Building and Construction Industries should urge their respective municipalities to discuss this matter with the provincial governments to a point where action may be taken.

It might be advisable to make some such arrangement as this: That upon proof of his own- ing the lot upon which he proposes to build, the state should lend to any returned soldier the money with which to enable him to establish his home, or at least some portion of the required money. This principle might be extended to all workmen, and would lead not only to contented workmen, but would pave the way for better generations to follow and would so advance industry and tend to the increased efficiency which is necessary if we are to compete with other countries in trade throughout the world.

Labor Leader's Address

Following the Minister of Labor, Tom Moore, president of the Trades and Labor Congress of Canada, de-

livered a speech which was closely followed by the members of the Association and which met with the hearty endorsement of all of those present on account of its broad and statesmanlike character.

He said that he had intended to discuss the relations of capital and labor in the building industries, but that he thought that it would probably be entirely erroneous to use the word "capital" in connection with this particular industry, as the building and contracting "game" had made more bankrupts and fewer millionaires than any other line of business that he knew of, and contractors could hardly be called capitalists.

"It is possible," said Mr. Moore, "for labor to build up a species of autocracy that would be just as evil as any autocracy of capital. If we cast our eyes to Russia we can see the danger of too quick a relaxation and a too sudden a swinging of the pendulum without the preliminary education necessary."

Outweigh the Irrational Elements

It should be the effort of the more balanced portion of both interests to find a middle ground upon which they can weld together and outweigh the irrational elements in both classes.

It is safer to put into operation the views of the majority than the views of the minority, however idealistic the latter may be. Laws are made but the majority voluntarily obey them, and if we put into our laws things that are distasteful to the majority it will lead either to law breaking to revolution.

Some sort of legislation is needed to make satisfactory a democratic control of industry. This may be easy today in the mining or steel industries, or in any other industry which is concentrated and where the employers are few and the employees closely gathered in large groups or communities; but it is not so easy in scattered industries like the building industries to establish joint councils like those in Great Britain. "If a representative of every building industry in Canada were to gather in Ottawa, there is not a hall in the city big enough to hold them," declared Mr. Moore.

Paper, mining, steel and other industries are different; they are more concentrated. Such concentration is highly desirable on both sides. An organization of the employ-

ers should have discipline and control over the men engaged in that particular industry in all parts of its district, and this control should become province-wide and even nation-wide.

This is also true of the workers in the industries, although we cannot expect the ideas of the workers to be as fixed as those of the employers, as the workers are more numerous and it is harder to co-ordinate their ideas.

Mr. Moore urged the employers present not to adopt too much of a "show me" attitude toward the new ideas of government of industries by trade councils of both employers and employees.

"Don't be like the stone mason who refused to admit the merits of concrete," said Mr. Moore. "The mason's friend was telling him the many advantages of concrete and that this new material is just as permanent as stone. This the mason was reluctant to believe, and finally ended the argument with the statement, 'If you can show me any new building that has stood as long as the old ones, I will be convinced.'"

Contracting is now carried on in an individual and competitive manner instead of in a co-operative manner and by united action. The industry is in the state of flux. Contractors cannot get different conditions or prices for cement, brick, etc. They take a certain condition of the market of these commodities as inflexible. Outside of the weather, on which they must gamble, the only flexible feature is labor. Why shouldn't the labor market be made as inflexible for a given period and a given district and a given trade as the material market? This would go a long way toward eliminating many of the elements of the competitive system, thought Mr. Moore.

Should Discourage Local Organizations

He urged the employers to discourage small local organizations of the men, as such organizations have no means of disciplining whole communities of their members. National and even international organizations have been found best by both workmen and employers. In these larger organizations, if a community of workers breaks an agreement and strikes, the larger body can say to them that they must go back to work or the organization will help the employer to find men to supplant them. Such discipline cannot be effected by purely local organizations.

Central Bureau Needed To Stimulate Building Industry Says Conservation Commission's Adviser

"APPOINTMENTS away from Ottawa prevent me from being present at your conference, I regret to say," wrote Thomas Adams, town planning adviser to the Commission of Conservation, to Mr. Anglin. Mr. Adams' letter was read by Mr. Armstrong at the Wednesday evening session of the Association of Canadian Building and Construction Industries.

"It is a pleasure to note that you are to discuss industrial housing, building by-laws and kindred topics. Had I been able to be present, all I could have done would have been to have emphasized the importance of some of the proposals which already have been made by yourself and other members of your organization as to the need of something being done to promote co-operation and to provide leadership from some central authority in regard to the housing problem in the Dominion.

"Without entering into the question of the relative

degree of responsibility that may attach to the Federal or Provincial Governments, I think I shall be echoing the unanimous view of those who have considered the housing problem as it now confronts us in Canada, in stating that some form of centralized machinery is needed to stimulate and direct building construction, particularly in connection with the building of small houses for working men. We need to have more research made into the numerous technical problems in connection with building, many of which have been the subject of little scientific study in the past, and we need also to so marshal and disseminate the knowledge accumulated that it will be accessible to all who can make practical use of it.

"The desire which has been expressed by you and others for some kind of Bureau to carry out this work, whether it be one Bureau for the whole Dominion or a group of Bureaus operating in each province, is based,

in your case, on practical considerations which give added weight to any argument which may be advanced on the basis of general principles.

"If the Bureau is formed to carry out research work, it should also give expert advice on questions of planning of land, streets and houses and of administration of public and private housing schemes. At a time when we are passing through a transition stage in connection with our industrial life, some such expert guidance would be most invaluable in connection with the reconstruction of our industries.

"It also appears likely that for a time at least some form of public contribution will have to be made, either as grants or loans to assist municipalities, and the different forms of private enterprise through the municipalities, to carry on building until capital becomes more plentiful and private investment in building becomes more secure.

"The housing question is being regarded as a national one in Britain and the United States and its solution in this country would appear to involve that there shall be some action on the part of all three forms of Government, federal, provincial and municipal; the action being primarily advisory on the part of the Federal Government and executive on the part of the municipalities, although to make it efficient certain executive functions would have

to interweave the whole machinery from top to bottom.

"As builders you are aware of the important connection between the method of developing the land,—including the method of planning and constructing the streets,—and the building operations which you carry on. It is perhaps unnecessary, therefore, for me to point out how important it is that any organization which may be set up to deal with the question of housing should also take into its purview the question of land development in relation to housing, and such problems of local transportation as have a direct bearing on housing. The long experience of England in this matter has produced the general conviction that the solution of the housing problem requires that it be dealt with simultaneously with the control of the land and the provision, where necessary, of means of transportation.

"If we are to obtain the best results from the efforts of builders and to get houses at an economical price or rent, we must have more economical methods of planning the land and less waste of our substance on land speculation.

"I trust, therefore, that in the consideration which you may give to the question of the industrial housing you will have regard to the importance of improving the planning of the land and regulating the growth of our cities and towns on more scientific lines."

Much of the Work of the Building and Construction Conference Was Done by these Committees

Building Situation

M. P. Davis, Ottawa (chairman); W. A. Mattice, Ottawa; James G. Shearer, Montreal; F. A. Gillis, Halifax; H. H. Vaughan, Montreal; H. Hayman, London; Ed. Cass, Winnipeg; J. D. Johnston, Toronto; Norman McLean, Vancouver; John Foley, Ottawa; W. A. Wilson, Regina; Col. J. A. Little, Port Arthur; A. Dinnis, Toronto; Claude F. Secord, Brantford; F. W. Paulin, Hamilton; J. Mantel, Hamilton; F. McCausland, Toronto; M. Gibson, Toronto; W. Palmer, Chatham; J. Douglas, Ottawa; F. Armstrong, Toronto; F. B. McFarren, Toronto; C. T. Pearce, Hamilton; W. F. Evans, Toronto; Robt. F. Dykes, Montreal.

Business Relations

Gordon C. Edwards, Ottawa (chairman); E. E. Poole, Regina; Jos. Gosselin, Jr., Quebec; J. W. Litton, Kingston; H. Elgie, Toronto; W. A. Chestnut, Toronto; J. F. Gregory, St. John, N.B.; Stewart Hughes, Toronto; G. A. Perrier, Halifax; H. Dancy, Toronto; J. A. Grant, St. John; W. M. Irving, Montreal; W. Doran, Ottawa; Ed. Cass, Winnipeg; W. S. Bellows, Fort William; A. Matthews, Toronto; J. Ritchie, Ottawa; W. A. Mattice, Ottawa; G. Oakley, Jr., Toronto; A. Nobbs, London; C. T. Pearce, Hamilton; Capt. F. Moseley, Montreal; A. Cameron, Montreal; M. Gibson, Toronto; E. C. McGovern, Ottawa; W. Dillon, Toronto.

Points of Order

E. R. Dennis, London (chairman); R. F. Dykes, Montreal; Walter Davidson, Toronto.

Finance

G. A. Crain, Ottawa (chairman); Alex. Bremner, Montreal; W. A. Mattice, Ottawa; Geo. E. Stocker, Toronto.

Publicity

E. A. Saunders, Halifax (chairman); G. B. Greene, Ottawa; J. S. Hooper, Winnipeg; Norman McLean, Vancouver; E. R. Dennis, London; H. P. MacMahon, St. Thomas; Weston Wrigley, Toronto; Major L. C. Reynolds, Toronto; A. E. Jennings, Toronto; R. H. Parson (official stenographer) Montreal.

Permanent Organization

Geo. Oakley, Jr., Toronto (chairman); W. E. Ramsay, Montreal; C. Smallpiece, Montreal; E. R. Reid, St. John; E. A. Saunders, Halifax; W. A. Wilson, Regina; Geo. Hayman, London; Thomas Chick, Windsor; John Eadie, Vancouver; A. Matthews, Toronto; G. H. Whitlock, Moose Jaw.

Resolutions and Order of Business

C. T. Pearce, Hamilton (chairman); Col. J. A. Little, Port Arthur; E. E. Poole, Regina; Albert Tomlinson, Chatham; P. A. Galarneau, Quebec.

Attendance, Membership and Welfare

Martin Lindsty, Toronto (chairman); J. S. Hooper, Winnipeg; F. B. Locker, Montreal; E. R. Reid, St. John; N. K. Reid, Toronto; C. T. Penn, Toronto.

Conference Arrangements

W. A. Mattice, Ottawa (chairman); J. R. Douglas, Ottawa; G. A. Crain, Ottawa; Hugh Peel, Ottawa; G. H. Watkinson, Ottawa.

Legal Affairs

J. A. Grant, St. John, N.B. (chairman); Ed. Cass, Winnipeg; Jno. V. Gray, Toronto; E. E. Poole, Regina; W. Dillon, Toronto; James Phinnemore, Toronto; Geo.

Oakley, Jr., Toronto; Daniel P. Hatch, Montreal; W. P. Baxter, Montreal; W. F. Evans, Toronto.

Labor Conditions

G. A. Crain, Ottawa (chairman); D. K. Trotter, Montreal; W. A. Quinlan, Montreal; J. R. Douglas, Ottawa; J. F. Schultz, Brantford; W. J. Green, St. Thomas; Alex. I. Garvock, Ottawa; Wm. Weller, Toronto; Jno. W. Litton, Kingston; F. C. Woodroffe, Montreal, Thos. Painter, Toronto; W. S. Bellows, Fort William; Jos. Gosselin, Jr., Quebec; W. A. Wilson, Regina; J. Phinmore, Toronto; H. Palmer, Chatham; A. Tomlinson,

Chatham; N. K. Reid, Toronto; J. T. Blyth, Ottawa; G. F. Frankland, Toronto; E. R. Dennis, London; J. Mantel, Hamilton; G. Perrier, Halifax; A. Matthews, Tor-

Code of Ethics

A. K. Cameron, Montreal (chairman); G. H. Watkinson, Ottawa; J. H. Shaver, Toronto; Geo. E. Stocker, Toronto; C. A. Chilver, Walkerville; W. Doran, Ottawa; J. W. Seeus, Montreal; E. Geery, London; J. A. Hughes, Toronto; N. K. Reid, Toronto; C. A. Gardner, Toronto; Geo. A. Perrier, Halifax.

Supply Firms Desire Protection—Fear That Reconstruction Will Bring Forth Unstable Contractors

THE Supply Section submitted to the Conference the following "resolution for the re-arrangement of trade relations at present existing between general or sub-contractors and suppliers of building materials":—

(NOTE.—This resolution was not adopted by the general conference, but was referred to the executive committee.)

Whereas the builders' supply companies are desirous of reducing the price of materials to the lowest point compatible with sound business policy, and, since such reduction is contingent on an elimination to as great an extent as possible of financial risks and credits; and

Whereas the present amounts held back on contracts under present arrangements are not sufficiently large to liquidate debts for materials in the event of the insolvency of the sub or general contractor; and

Whereas the element of time existing between the letting of general or sub-contracts and material contracts is so great as to encourage the growing vicious practice of price-peddling and price-cutting; and

Whereas the builders' supply concerns are keenly desirous of assisting in the larger program of construction now under consideration, and believing that this assistance can best be rendered by reduction of the large number of accounts receivable, it is necessary for them to carry under the present system without suitable security; and

Whereas there is a belief that an impetus in building will undoubtedly call into existence a large number of contracting firms of such insufficient stability as will mili-

tate against our best relations with reputable contracting companies; and

Whereas the present condition of material credits, securities and bartering for low prices with insufficient profit protection is a factor of reaction against reputable contractors and in favor of unscrupulous practice; therefore be it resolved:—

1.—That where supply concerns are asked for prices on material by a sub-contractor or general contractor, and these prices are used in the making up of tenders, in the event such contractors are awarded the contract, he or they shall *immediately* award the material contracts to those supply firms whose prices were used in making up such contract tenders.

2.—That copies of material tenders given to general contractors or sub-contractors shall be forwarded to the architect and general contractor to facilitate the awarding of material contracts at the time the general and sub-contracts are let.

3.—That supply men should insist on terms of "thirty days net" as a means of reducing risks and credits and as an indirect means of reducing prices of material.

4.—That either bonds or forms of security be placed by builders' supply companies and sub-contractors with the architect or with each other, and contracts shall not be considered finished and all parties released until obligations of payment for material or services have been liquidated.

5.—That the Supply Section of the Association does strongly suggest to its members the necessity of the adoption of these resolutions.

BUILDING INDUSTRIES CONFERENCE

(Continued from page 488)

ial prepared by the Provincial Association of Contractors of Ontario:—

Memorial to the Government

"Memorial to the Right Honorable Sir Robert L. Borden, P.C., G.C.M.G., K.C., LL.D., Prime Minister, Ottawa, Canada, and to the Honorable the Members of the Government of the Dominion of Canada; this memorial humbly sheweth:

"Upon behalf of the contractors of the Dominion of Canada, we, the undersigned, respectfully request no public buildings should be erected in the Dominion of Canada except by Canadian contractors, and that this also

apply to all concerns acting for the Government or operating under Dominion incorporation. In support of that request, we beg to set before you the following consideration:

"(1)—The Canadian contractors have demonstrated over and over again their ability to erect structures of any kind whatsoever required for the purpose of their own country.

"(2)—Canadian contractors are interested in the welfare of Canada, and contribute to its taxes and to its growth, whilst contractors of other countries merely make money in Canada for the purpose of spending it in the country to which they may happen to belong. They also have a tendency to recommend and use foreign material which is an injury to Canadian industries.

"(3)—Canada has made such generous contributions towards the successful prosecution of the war that the

Government of the country should see to it that every line of activity is safeguarded, because it is becoming more and more evident that one industry of our country cannot suffer without every other industry suffering with it.

"(4)—Patriotic contractors, as well as architects and engineers of military age, have volunteered to fight at the front and for other duties in the war, and thereby have established a claim for consideration towards their fellow contractors.

"(5)—The business of contractors has been greatly interfered with by the patriotic necessities occasioned by the war, so that the work to be done, even if executed by Canadian contractors alone, is not more than sufficient for their needs.

"Respectfully it is submitted that if due weight is given to the above considerations, one course only will commend itself to you and to other members of your Government, namely to take every pains to see that the erection of public buildings is entrusted to Canadian contractors and to them only."

Stiff Opposition to Memorial

Mr. Elgie stated that the above memorial had been signed by a large number of public and private bodies throughout Ontario, and that as a matter of fact he had a grip full of these printed memorials signed by the various organizations.

J. Fraser Gregory, of St. John, said that the supply section of the Conference, after listening to the Hon. Frank Carvell, and having every faith in his integrity and purely Canadian attitude, considered this memorial to be ill-timed, out of order and beyond the scope of the members' present desires. He therefore moved that it be referred back to the committee. This motion was seconded by R. F. Dykes, of Montreal, and was supported by a number of other members.

"This association should be larger and more patriotic," asserted Mr. Gregory, "than to introduce such a memorial as that presented to-day. We have elected a Union Government and we have every faith in the patriotism of the members of that government. They are just as patriotic and more so than we are. To pass this memorial would be to build a board fence around Canada, and we will suffer more than we imagine. We would keep others out, but ourselves in.

"We expect big things in the way of foreign trade. Are we to expect to send our materials and our products into other countries, but have nobody send them into us? Such an attitude is outrageous at a national meeting. We will get an assured preference from the Government for Canadians and Canadian materials whenever possible, without presenting this memorial."

Mr. Elgie said that he resented the tone of the criticism. The memorial had passed all through Ontario, and had been signed by numerous bodies. It was presented to this Conference because he had understood that Mr. Anglin was favorable toward the memorial and thought that the new Association and the Ontario organizations would be able to work together on it. It was up to the Conference to accept this memorial or to prepare a new one, said Mr. Elgie.

Second Clause Eliminated

It was decided to consider the memorial clause by clause. The preamble and the first clause were adopted, but it was decided to eliminate the second clause, as a large majority of the members present felt that it is a contractor's own affair where he spends the money he makes.

Mr. Elgie fought hard against the elimination of this clause, stating that it would take the backbone out of the whole memorial. He claimed that the memorial belonged to Ontario, and thought that the Conference should not tear the memorial to pieces after the four years' work that had been spent upon it by various bodies in Ontario.

Mr. Elgie said he was the father of the memorial and that he had been working at it for six years. In Ontario, contractors' plants are rotting, he declared, because the contractors are afraid to approach the government. At one time he had a plant with which he handled at once two churches, a couple of schools and some other buildings, and Sir Henry Pellatt's castle; but now, through lack of use during the past few years, his plant is not fit to build one church.

He claimed that other contractors in Ontario are in the same fix, whereas American contractors have been coming and getting big contracts both private and public.

Mr. Anglin said that as his name had been mentioned in the discussion, he wished to explain that he was always democratic, never opposing the views of the majority, and was quite willing to change his opinion in regard to the memorial. He felt that if the memorial were to be reconsidered again by the bodies throughout Ontario who had signed it, that they also would change their opinion.

He said that all contractors have grievances because "juicy" contracts had been given out to United States firms which could have been carried out just as well by Canadian firms.

"Things are changing, however," declared Mr. Anglin, and I feel that this Conference itself is the best memorial that we could arrange for presentation to the Government. We may say that the Government has received our memorial on this and all building questions.

Many Controlled from United States

"We must recognize that many of our big concerns are controlled from the United States. United States officials often have control of where the contracts shall be placed, and it is only natural that at times they may want to place them with men whom they know and who have possibly done other work for them in the United States. In other instances the projects are partially financed by the contractors, and this is the competition we must meet. We must be in a position sometimes to finance projects ourselves in order to get the contracts, and that is the sort of thing we have to discuss to-day,—to stabilize the building industry.

"As chairman I do not like to upset the debate regarding this memorial. Scrap it out if you wish, but I think it would be wise to refer it back to Ontario."

W. E. Ramsay thought that "if we are to have a great expansion in Canada in the next few years, we must have money. Not having the money, we must go into foreign markets for it. Every dollar that is sent into this country from foreign contractors enhances the resources of this country. Therefore we should not be too provincial.

"The fraternity that has been created between the United States and Canada by the war will eradicate any feelings that may have previously existed between the contractors of the two countries. We must remember that the United States have spent a great deal of money in Canada. When the boys come back from overseas we will all be one great Anglo-Saxon brotherhood on this continent and therefore we should consider this memorial outside of the province of this convention."

Norman McLean, of Vancouver, said that he could see that in the past the fault had not been so much with the owners as with the architects. "Foreign architects who

know nothing of our resources or materials, naturally specify the materials with which they are not familiar. Canadian contractors, not knowing the foreign materials, are naturally at a disadvantage. The United States firms have shown that they are with us heart and soul; and the small issues that divided us are being rapidly blown away.

Employ Canadian Architects

"Canada as an empire reaching from ocean to ocean is a bigger thing than any provincial matter. Instead of passing this memorial we can get the same results in a better way by protesting against the employment of foreign architects. The Canadian architects can be entrusted to give the work to Canadian contractors, and thus we will secure our object more harmoniously."

At this point it certainly looked as if the memorial would be entirely shelved by the Conference, but James Phinnemore, of Toronto, in a strong speech, completely reversed the situation, and immediately after his speech all of the other clauses of the memorial were adopted in rapid succession without further debate, so that the whole memorial was adopted with the exception of clause 2 and was sent on to the executive committee for presentation to the premier in whatever manner and at whatever time the committee may deem most appropriate.

Mr. Phinnemore claimed that the Canadians need offer no apology for being Canadians and for standing firmly for Canadian industries. In the United States they have followed the line of self preservation, he said, even individual cities of their brotherhood enacting laws operating against each other in order to build up their own state. He had seen public buildings in the United States covered with signs proudly announcing that every material entering into the building had been produced within the state, and he knew that there were many states that encouraged the growth of all sorts of industries within the state by enacting special laws tending to promote such industries by giving them an advantage over similar industries in neighboring states. In view of this Canada need not apologize for making a stand on the principle involved.

Mr. Phinnemore claimed that the people of the United States would think none the less of us if we fight for our own interests within our confines. "The exchange of products with Canada can go on just the same. We already have a wall around Canada, a revenue wall built by our government.

Carried by Nine Votes

"Our contractors have suffered from foreign competition. Don't let this good fellowship feeling run away with your judgment in the interests of Canadian building industries," concluded Mr. Phinnemore, whose oratory carried the meeting. A standing vote was called for and a motion to refer the memorial back to the committee was lost by just nine votes.

On Thursday morning the report of the labor committee was presented. The report will appear in full in next week's issue. It was referred to the executive committee.

J. A. Grant, of St. John, N.B., chairman of the legal committee, submitted the following recommendations which were also referred to the executive:—

"That this committee recommends that the executive appoint a standing committee to investigate the feasibility of standard building by-laws throughout Canada and to consider ways and means to carry same into effect.

"This committee recommends in view of the difficulty in changing lien laws in the different provinces at the present time and the serious difficulty caused by unfamiliar-

ity with existing laws, that the executive have prepared a pamphlet for distribution to members of this association, describing the various lien laws of the provinces and notes on same.

"Bid bonds, standard agreements and unit prices were discussed but no decision was arrived at and no recommendations are made."

G. E. Stocker, of Toronto, chairman of the committee on "Code of Ethics," submitted the following report:—

Code of Ethics Committee

"This committee recommends to this association that the permanent executive appoint a standing committee to consider the following resolutions, with power to act:—

"When general contractors submit their tenders to the architect or owner, the general contractor should list the names of the sub-contractors whose tenders he used and advise the sub-contractors. In the event of his tender being accepted the general contractor should notify his sub-contractors immediately. The same conditions should obtain with respect to sub-contractors and their respective supply men.

"It is recommended that the sub-contractors shall receive payment in the same proportion and substantially at the same time as payments are received by the general contractor.

"That the matter of bonds, bonus and penalties, as between general and sub-contractors, be left to their own individual arrangements to suit specific conditions, but when required shall be on a proportional basis.

"In view of the fact that in several districts of the Dominion there are at present no branches of this association or duly representative bodies, we recommend the appointment and location of zones of operation be deferred until representative sections have decided to co-operate."

W. E. Ramsay, chairman of the nominating committee, presented the nominations for officers and for the National Council. The choice of a second vice-president resulted in discussion which tended toward sectional feeling, and as a result it was decided to cancel the election of Stewart Hughes, of Toronto, as second vice-president and elect nine vice-presidents, one representing each province. The result of elections is shown in the list of councillors on page 487 of this issue.

The meeting adjourned at noon in order to interview the representatives of the Federal Cabinet. The ministers received the delegates in the court room of the Board of Railway Commissioners. The report of this meeting is given on page 488 of this issue.

At 1 o'clock a luncheon was held at which Senator Robertson and Tom Moore were the chief guests of honor. (See page 499 of this issue for abstract of these speeches).

Permanent Secretary Wanted

Another general session of the Conference was held at 2.30 p.m. The chairman said that the Conference was now drawing to a close excepting for a meeting of the new National Council which was to be held at 8 p.m. The report of the nominating committee regarding the nine vice-presidents was received and adopted, and it was decided that the executive committee should consist of the officers and the "ex-officio members" of the council.

The appointment of a permanent secretary was urged, and it was decided to leave the matter in the hands of the executive. J. P. Anglin proposed A. E. Jennings of *The Canadian Engineer*, as temporary secretary until a permanent official could be found. A motion to this effect

(Concluded on page 506)

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CONTRACTORS SHOW ORGANIZING ABILITY

AT the conference of building interests held last week in Ottawa, the contractors and supply men proved their organizing ability. If the power to organize is the chief requisite for success in contracting, as is often asserted, then the men who participated in the conference last week must all be very successful citizens.

Particular credit is due to J. P. Anglin and the men who assisted him in the preliminary arrangements. We venture to state that such a well-organized, earnest, hard-working convention has never before been held in Canada.

The attendance was excellent both in quantity and quality. The association is off to a good start. It has the enthusiastic backing of some of the most prominent figures in Canada's industrial life to-day.

In scope the organization has broad possibilities, representing all classes of technical skill, labor, business and capital. It should not be long before the association attains a national position second only, perhaps, to the Canadian Manufacturers' Association and the Engineering Institute of Canada.

OPENING PUBLIC TENDERS

TORONTO has a clean municipal government. No city in America has permanent municipal officials of finer personal characteristics. "Graft," if it ever existed in Toronto, is certainly a thing of the dim, distant past. The presence in Toronto's city hall of men like George Powell, Thomas Bradshaw, R. C. Harris, Thomas McQueen and many others of equally high reputation, ensures a fair and square deal for all who have business relations with that city. But for that very reason those men should set the example for the officials of other communities. They can reasonably be expected

to do so. All of which is prefatory to a protest against the method of opening tenders now in vogue at Toronto.

Tenders for annual supplies for the city of Toronto for the year 1919 were called to be in the hands of the Board of Control by noon of Tuesday, November 12th. Those tenders should have been opened publicly at once! At Montreal the City Commissioners have a box into which the bidders drop their sealed envelopes, and at the stroke of noon on the appointed day, the box is carried into the Commissioners' room and the tenders are immediately opened and read. There is no such business-like procedure at Toronto, where the usual practice is to open the tenders a day after they are received. On the morning of November 13th, several anxious bidders, including a few "out-of-town" men, gathered in the Board of Control room to hear the tenders read. But Mayor Church announced that as November 11th had been a holiday (to celebrate the armistice) the mails had been delayed and all tenders were probably not yet in hand, so the opening would be postponed for twenty-four hours.

On November 14th the numerous contractors again gathered in the Board of Control chamber, where nothing short of farce-comedy was enacted. Controller McBride slit the envelopes and passed them, one at a time, to the Mayor. Upon removing the contents of an envelope, the mayor would sometimes mumble some quite unintelligible words; sometimes he would read the amount of the marked cheque; then again he would merely say, "This is a tender for sand"; or perhaps, "granite block tender". He did not read the tenders thoroughly and clearly. There was no uniformity of procedure, and practically no information could be obtained by anyone present.

Later in the day *The Canadian Engineer* urged various officials to give out the prices without delay, but was met with refusal on the ground that they had to be tabulated by Mr. McQueen, the secretary of the Board of Control. On November 15th the asphalt prices were given out but it was not until noon of November 18th that any information could be obtained about the many other materials for which tenders had been received.

The mayor stated that the law requires tenders to be opened in public but does not say anything about their being read. The mayor is a lawyer and we are prepared to accept his legal opinion on this point. But if that is the law, the Ontario legislature should change the wording of the Act. It may be the letter of the law, but surely it is not the spirit. Mere slitting of the envelopes should not constitute "legal opening" of public tenders.

Commissioner Harris, early in the afternoon of the day the tenders were opened, said that if the mayor had attempted to read all the prices, "he would be there yet." What of it? That is part of what the mayor of Toronto is paid \$7,500 a year to do. It has to be done only once a year in connection with annual supplies. Is it asking too much of a mayor to spend a few hours once a year in properly opening tenders for many thousands of dollars' worth of materials?

If His Worship's time is so valuable that it cannot be devoted to municipal business of this kind, he should depute the work to some other alderman or official. Any other responsible and intelligent person could do it just as satisfactorily. The bidders do not care who reads the tenders or who slits the envelopes. It is not the mayor's baritone voice that interests them, but the cold facts of whether they are likely to get the contracts.

May we repeat, for the assurance of the bidders at Toronto, that we feel positive that there was no wrongdoing in connection with the tenders after they were open-

ed, and that the trouble lies merely in the system of handling the tenders,—a wrong system that has been followed at Toronto for many years past.

Convinced of their own honesty, the Toronto officials are indignant at any suggestion of wrong-doing, and rightly so. But that is no excuse for their tolerating any longer a system which in future years might lead to unmitigated abuses should it fall into the control of men less honest than those now at the head of Toronto's affairs. The secretary of the Board of Control, in particular, is unnecessarily allowing himself to be put in a false position, for no reason whatsoever, when he accepts responsibility for the care of opened but unread tenders.

PERSONALS

LIEUT. HARVEY C. C. WALKEM, who won the Military Cross in France, has been appointed resident engineer at Petewawa Camp, Ont.

J. A. TOBIN, of the C.P.R. Co., has been appointed assistant superintendent of the Trenton Division in place of T. H. Hamilton, who has been transferred.

S. J. HUNGERFORD, formerly general manager of the Canadian Northern Railway government lines, has been appointed assistant vice-president, with headquarters at Toronto.

LOUIS LAVOIE, until recently purchasing agent for the Department of Railways and Canals at Ottawa, has been appointed Assistant General Purchasing Agent for the Canadian government lines.

LIEUT. GERALD MURPHY, a former engineering student at the University of Manitoba, has been repatriated after spending over two years as prisoner in Germany. His home is at Moosomin, Sask.

LIEUT. A. TOWER FERGUSSON, a Science graduate of 1911 from the University of Toronto, has been awarded the Military Cross. He went to England in December, 1917, in charge of a draft, and won his decoration in the Battle of Amiens.

CAPT. L. W. WYNNE-ROBERTS, R.E., is now stationed in Persia. His address is Field Officer, care of C.R.E. Persian Lines of Communication, Mesopotamia Expeditionary Force. Capt. Wynne-Roberts is engaged in macadamized road construction.

LIEUT. S. E. STOREY, of the R.F.C., is expected to arrive at Regina very shortly. Upon his return he will again become associated with the firm of Storey & Van Egmond, architects, McCallum-Hill Building. Lieut. Storey has been in France for over three years.

E. LANGHAM, who for many years has held the position of general purchasing agent for the Canadian Northern Railway Company, will have his jurisdiction extended to cover the entire Canadian Government lines which embrace the Canadian Northern, Intercolonial and National Transcontinental.

LIEUT. W. H. RICHARDSON (B.C.E. Man.) returned to Winnipeg on Nov. 23rd, after four strenuous years in France. He won his commission after two years in the ranks, and has been wounded three times and decorated by the King twice, receiving the Military Cross and bar. As Lieut. Richardson is with the Imperials, he will return to England in January for discharge.

MAJOR FREDERICK JAMES MULQUEEN, M.C., of Sao Paulo, Brazil, who was wounded in the September fighting, has been awarded the D.S.O. Graduating in Science

in 1913 at the University of Toronto, he joined the motor boat patrol of the navy at the outbreak of war and was promoted from 2nd to 1st lieutenant. He reverted to 2nd lieutenant to go to France a few months later with the Field Artillery, and in May was transferred to the Engineers. He is now O.C. of a Field Company of the Royal Engineers.

OBITUARIES

EDWARD BENNIS, managing director of Ed. Bennis & Co., Ltd., of Bolton, England, died October 29th in his 81st year. Mr. Bennis specialized throughout his career on the mechanical firing of boilers.

MAJOR LUNDY, R.E., D.S.O., was killed in action in France on October 14th. He was a civil engineer, and spent two years in Halifax in connection with the construction of the Woodside Refinery. He left Halifax two days after the war broke out and went to France almost immediately as a lieutenant in the Royal Engineers.

ALBERT JAMES HALL, C.E., of New Westminster, B.C., died recently at the age of eighty-two. He was one of the first members of the Canadian Society of Civil Engineers and a member of the Institute of Mining Engineers. For a number of years he was chief engineer of the New Westminster Southern Railway, and later was appointed city engineer for New Westminster. In 1880 he was engaged on construction work with the Canadian Pacific Railway, but four years later he began private practice.

BUILDING INDUSTRIES CONFERENCE

(Continued from page 504)

being made, the appointment was confirmed by the Conference.

Mr. Jennings accepted the appointment with the understanding that it would be without remuneration and that it would be very temporary, with the expectation that the executive would secure at the earliest possible moment an official who can devote his entire time to the work of the association. The man whom the executive committee have in mind for the position is now overseas and the president is taking steps to ascertain whether he will undertake the work and whether he can be released from military duty.

It was announced that owing to lack of time a resolution regarding memorial halls would not be presented, but that literature on this subject would be prepared and forwarded at a later date to the executive.

The treasurer reported that \$1,000 had already been subscribed toward the expense of the Conference, but that there would be further expenses and he would be pleased to receive additional subscriptions from any firms or individuals who might care to support the association pending the adoption of by-laws and the inauguration of stated fees for membership.

At 3.15 p.m. the Conference adjourned to visit the new Parliament Buildings, where the delegates expressed great pleasure at the excellent work done by Canadian architects.

The executive meeting which was held on Thursday evening (the proceedings of which are not available for publication), concluded the preliminary organization of the Association of Canadian Building and Construction Industries.