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The Canadian Engineer

A Weekly Paper for Civil Engineers and Contractors

Report Presented by Status Committee to J.C.T.O.

Complete Text of Draft Bills Formulated for Joint Committee of Technical Organizations by Its Status Committee (H. G. Acres, Chairman) as Model Legislation for Uniform Provincial Acts — Report of Status Committee, Introductory to Draft Bills, Discussing Need for Legislation

THE phrase, "Status of the Engineer," may be roughly defined as the reputation and degree of prestige which the engineer enjoys or deserves in the eyes of his fellow-citizens, having due regard to the value of his services to the public at large.

Status involves two essential factors: First, recognition of engineering as an essential profession, through the agency of both public sentiment and legal enactment; and, second, an adequate scale of remuneration for services, as compared with other professions and with trades.

These two factors may be shortly defined as "recognition" and "remuneration."

In handling the above two phases of this problem it is necessary to determine whether they are of equal importance, or whether one takes precedence over the other, and, finally, if the latter is the case, to fix the order of precedence.

The argument under this head can be conveniently established by analogy. From the bald standpoint of remuneration, engineering service is just as properly a commodity as manual labor, and the revenue derived from its sale is governed first by the number of purchasers who need it, or think they need it, and second, by the amount of such commodity the individual purchaser can be prevailed upon to absorb in place of some other commodity which he has used previously in place of it. There is no virgin market for engineering services. It must compete in long-established markets with other commodities which it must supplement or displace.

The organization of the trade union was essentially an expedient to advertise the worth and importance of a commodity which, for lack of a better term, may be called "manual labor." The unity of interest created by such organizations enabled the manual worker to make use of the strike as an additional advertising expedient, and as a result of the forced recognition thereby realized, he was able to demand a higher price for the commodity he produced, and by the sale of which he existed.

Commodity Must Be Recognized

There was no virgin market for shredded wheat. A carefully planned and extensive advertising campaign was instituted to prevail upon the public to eat shredded wheat instead of oatmeal porridge. Through this expedient recognition of shredded wheat was grafted on the public mind. It was educated to think it needed shredded wheat, and thereafter remuneration accrued to the Shredded Wheat Co., with resulting prosperity.

Whether the commodity is "manual labor" or whether it is "shredded wheat," it must be recognized before it can be sold. The greater the public need, whether fundamental, as in the case of manual labor, or cultivated, as in the case of shredded wheat, the greater and more certain will be the remuneration.

Considered from the non-æsthetic standpoint as a commodity, engineering service must conform to the same economic laws, and recognition must of necessity be the precursor of remuneration. This proposition would seem to be amply vindicated by the fact that it applies to any individual consultant who has a large clientele, and who can demand a large fee for his services. Almost invariably it will be found that such a man has demanded a higher price for his services as their value became more fully recognized and established. He first obtained recognition through the medium of some form of advertising, which educated an ever-increasing body of the public to need him, or think they needed him, and remuneration followed as a matter of course.

Recognition Precedes Remuneration

The problem of establishing the status of the engineer therefore resolves itself essentially into devising some means of applying to engineers as a class the laws which have operated successfully in the case of the engineer as an individual. In other words, engineering service generally must have recognition commensurate with its value to the community at large before adequate remuneration can be obtained for engineers as a class.

If, therefore, the engineer is to take the place in the community to which he is entitled by virtue of his attainments and the high class of service he can render, the primary requirement is recognition.

Recognition is obtainable by two general methods, more or less distinct—namely, by general publicity and by legislation.

The ordinary means of obtaining publicity for the engineering profession are many and diverse. The outstanding requirement under this head is for engineers as a class to participate in the affairs of national and provincial government. This contention is so fundamentally sound and has been so often repeated, and so generally recognized, that it is not necessary to enlarge upon it. It is true beyond the possibility of argument that the status of the engineer as related to national affairs cannot be advanced or conserved unless engineers themselves exercise active governmental functions, and pass, as well as frame, the laws relating to or incidentally affecting the profession. The civil service bill now before the Dominion house is a luminous exemplification of this condition. This bill is of vital importance as related to the status of engineers as a class. It seeks to give engineers in the civil service a professional status as distinguished from the status of the ordinary departmental clerk, and also to establish an advanced salary scale. It has been framed with the assistance of engineers, but it is fairly safe to say that there is not a single practising engineer in the House of Commons to argue and support the passing of this bill. Its very doubtful fate rests mainly in the hands

of lawyers, doctors and farmers. The probable opposition and non-support of such men cannot be charged so much to active enmity as to excusable ignorance and lack of interest, for which condition engineers themselves are mainly responsible.

Among other channels of publicity may be mentioned the active participation of engineers in town planning, housing and settlement problems, and in developing such problems into specific schemes for government ratification and administration. Conditions governing publicity in the broad sense demand that engineers must seek out and identify themselves with all beneficent movements and projects, particularly those which have a wide public appeal.

Unionism Not Proper Medium

Finally, there comes the question of unionism as a means of obtaining recognition through publicity. The various technical organizations of this country could assume the essential functions of a trade union if their constitutions were so amended as to permit them to adopt the principle of collective bargaining and to promulgate strikes. This method of obtaining recognition is without doubt repugnant to the majority of engineers, and, while some transitory benefit might be derived by junior engineers, the general effect would be a very material lowering of the status of the engineer in his own estimation, and in the estimation of the public from whom he derives sustenance. It is difficult to conceive of a town manager, a commissioner of works or a consulting engineer participating in a strike, or to imagine that the diverse, and at the same time interlocking, activities of engineers could be so grouped and segregated as to render them susceptible to the principle of collective bargaining. The proper sphere of activity for any man who wishes to use collective bargaining and the strike as an economic weapon is in a trade, and not in a profession. The value of creative engineering work and the work incidental to the solution of engineering problems in general must be appraised on an individualistic and not on a collective basis. Unionism does not therefore appear to be a proper medium of publicity for engineers to employ as a means of obtaining recognition.

The other factor involved in the problem of recognition is legislation. In its relation to the matter of recognition, legislation should be considered as a defensive weapon, as distinguished from publicity, an offensive weapon. In other words, publicity should be the sword, and legislation the shield, of the engineering profession.

Legislation For Public Welfare

The primary function of all legislation is the protection of the public. If this principle is rigidly applied to any engineering legislation that may be framed, it will be found that the engineer has received his full measure of protection, not as an engineer, but as a part of the body politic. All that engineers as a class are entitled to is some effective means of protecting their professional reputation and prestige. Legislation can certainly be framed to meet this end, and so framed as to be for, and not at the expense of, the public weal.

Anything beyond this must be defined as "class legislation," which, in the final analysis, does not protect, but stigmatizes, and would ultimately force the engineer into the position of having to protect his legislation instead of having his legislation protect him.

On the basis of the above premises, therefore, it should be possible to roughly outline the salient features which properly framed engineering legislation should embrace.

The more important features of such legislation are cited hereunder.

Cognizance of Existing and Future Conditions.—Under this head must be considered the comparative youth of engineering as a recognized profession, and the very great difficulty of so exactly defining the functions and activities of an engineer that such definition would hold in law. It would appear that the most practicable way of overcoming this difficulty would be to vest considerable discretionary power in any board or commission which might be delegated to administer the law. This discretionary power would be exercised in respect of such matters as the recognition of engineers practising at the time the law comes into effect, the classification of engineers according to specialties, the formation of partnerships, the granting of exemptions, the fixing from time to time of standards of qualification, the revocation of privileges, and the enforcement of penalties.

Malpractice.—The public and the competent engineer should be protected from wilful or involuntary malpractice. It is just as important to have healthy and efficient engineering structures built by responsible and competent engineers as it is to have the health and efficiency of the individual citizen maintained by competent medical supervision. If the protection of the law is necessary in one case in the public interest, it is equally necessary in the other.

Conservation of Man-Power.—The necessity for conserving and developing national resources to the utmost is receiving world-wide recognition at the present time. The development and conservation of natural resources can reach a high stage of efficiency and economy only by giving primary consideration to the conservation and development of man-power. The man-power of the province of Ontario is developed in one direction by an elaborate system of public education, consisting of primary schools, high schools, collegiate institutes and a government-supported university. The province, therefore, expends a considerable sum of money on every engineer it graduates from the university, but under present conditions ceases thereafter to assume any responsibility for his professional advancement or to provide for any return on the investment made in his behalf. Obviously, this return could best be realized by applying the engineering man-power so created to the development of provincial industry and to the conservation and development of the natural resources of the province. Such procedure would be eminently in the public interest, and any enactment leading to its consummation would come well within the limits of permissible engineering legislation.

Development of Home Trade.—This phase of the situation is closely allied to the problem of conserving man-power.

The surest indication of a country's prosperity is a favorable trade balance, which in turn is measured by the volume and extent of its home trade. The condition of the home trade of any country is solely dependent upon the volume and diversity of the commodities it can produce for the needs of its own citizens. This condition applies as properly to the service of its engineers as to the products of its fields, and any measures taken to provide that engineering service be purchased within the province would be in the public interest in so far as the development of home trade is concerned.

International and Interprovincial Comity.—Under this head comes the important feature of so framing engineering legislation as to obviate any onerous restrictions on the practice of the profession by bona fide engineers entering the province temporarily, or with the intention of becoming permanent or naturalized citizens, and in general to place the engineering profession in the province beyond the fear of reprisals, or other demonstrations of ill-feeling, on the part of other countries or provinces. This feature is more or less in direct opposition to any drastic enactments which might be considered in relation to the conservation of man-power and the development of home trade. These three features must, therefore, be considered together in an effort to effect a reasonable compromise.

Assuming the above general specifications as a groundwork for the framing of a law which, while adequately establishing and protecting the status of the engineer, will at the same time be in the public interest, it remains to discuss the general form in which such legislation might be presented.

All existing and proposed legislation of this class involves the principle of registration, and the issue, in some form or other, of a license to practise. It is significant that all engineering legislation recently enacted vests the administrative control of registration and the issue of licenses in the government, and not in a council or board appointed by the engineers themselves. Herein lies the basic distinction

between "class" legislation and "popular" legislation, as applied to the particular subject under discussion.

The most comprehensive piece of legislation now in force with reference to this subject is that incorporated in the Civil Administrative Code of the State of Illinois. In this case the administrative function is vested in a department of registration and education, and the powers of this department are made sufficiently broad and general to permit it to exercise its functions not only in respect of all professions, but all trades. The regulation of any specific profession or trade is accomplished in two ways—either by a special act making regulation compulsory, or by application to the department of registration, voluntarily requesting regulation. Two instances of the first alternative are the structural engineers and the architects of Illinois, in respect of both of whom compulsory regulating acts were introduced in the state legislature during the present year.

Two pieces of legislation, the first covering the general principle, and the second the specific case, constitute what appears to be an adequate and satisfactory means of improving and fixing the status of the engineering profession in Illinois, while at the same time they express the popular will.

The latest development in legislation of this class is the Michigan Registration Act. In this act an effort is made to devise workable legislation covering the combined activities of engineers, architects and surveyors. While it lacks the complete generality of the dual enactments of the State of Illinois, it similarly vests administrative control in the government, thus classing the act as popular legislation, and it furthermore avoids the dangerous practice of attempting to rigidly define by legal enactment the professional functions and activities of engineers, architects and surveyors. Instead, it leaves all matters relating to the classification and status of applicants for registration to a registration board which is created under the terms of the act. While the exercise of this discretionary power may possibly lead to anomalies and abuses, it will be much easier to remove them by subsequent amendments to the act than to revise, extend or condense, by amendment, the legalized definition of a civil engineer, a mining engineer, an architect or a surveyor.

The likelihood of an engineering act becoming law is largely dependent on the generality and breadth of its application, and on the basis of this test the two Illinois acts have more of the aspect of popular legislation, and have a wider public appeal, than the single Michigan act. Consequently, while it might not be proper to frame a general registration act to cover trades as well as professions, it would seem advisable to consider the adoption of the Illinois principle in so far as engineering and the allied professions are concerned. With legislation so limited for the time being, it could later be enlarged by amendment to include all professions and technical occupations, should it ever be necessary in the public interest to do so.

Based upon the above premises and specifications, it should now be possible to tentatively frame the terms of an act in sufficient detail to furnish ground for discussion.

TITLE: An Act to regulate the practice of professions and allied technical occupations and to provide for the registration of persons engaged in practising the same.

Short Title.—"The Professional Registration Act."

Administrative Agency.—The creation of a Department of Registration under the jurisdiction of the Minister of Education and the creation of the office of "Director of Registration."

Functions of Department of Registration.—(a) To administer and enforce laws relating to the regulation of specific professions and technical occupations, and to formulate rules and regulations for administering the same and for the fair and impartial examination of candidates for registration.

(b) To establish and control the standard of preliminary education necessary for admission to training schools, colleges and universities.

(c) To provide, on appeal, for re-examination of candidates and for rehearings in the case of action to revoke a license or certificate where it appears that justice has not been done.

Specific Legislation.—Specific legislation for the regulation of any particular profession, technical occupation or branch thereof may be introduced (a) on the initiative of the Minister of Education, should he consider such procedure necessary in the public interest; or (b) by request, through the Minister of Education, of a majority of the persons engaged in such profession, technical occupation or branch thereof.

Certificates and Licenses.—To be issued by the Department of Registration.

Exemptions.—The provisions of this act shall not be enforceable in respect of the practice of law, medicine, dentistry and surveying, as long as the laws now regulating these professions and occupations continue in force.

Assuming that the above terms, properly elaborated, would meet the requirements of a general act, which, by virtue of its generality, would require a minimum of amendment in the future, the next step is to outline the terms which should be incorporated in such specific or subsidiary acts as might be required in the future to embrace all branches of engineering activity, having particularly in mind the fact that, as the status of the engineer improves and becomes more generally recognized, his various lines of professional activity will become more sharply defined and more uniformly susceptible of regulation. The most acceptable form for these subsidiary acts is one which will be of the same general type for all branches of engineering, so that they can be passed as parts of the general act, at any time, by order-in-council, on the authority of a house resolution.

It would be necessary for such an act to contain the following provisions:—

TITLE.—An Act to regulate the practice of..... and to provide for the registration of.....

Short Title.—"The .....Registration Act."

Administrative Agency.—Under the general direction of and appointed by, the Department of Registration, a Board of Examiners, one of whom shall be a professor or associate professor of.....in the University of....., and four other members, who shall be.....of recognized standing, who have had not less than ten years of bona fide experience in the practice of....., and who have resided continuously in the Province of .....not less than five years

Functions of Board.—(a) To receive applications for registration, and, at their discretion, accept those which properly come under the classifications they are delegated to examine, and to reject or refer elsewhere such applications as do not; (b) conduct hearings on matters relating to the revocation of, or refusal to renew, licenses or certificates, and at their discretion to revoke or refuse to renew the same; (c) establish regulations and rules of procedure for the proper administration of the law; (d) examine into and fix if necessary the standard of personal qualifications of applicants.

Reciprocal Registration.—Provision must be made for registration of practitioners from foreign countries or other provinces.

Public Works.—Provision making it obligatory that construction and maintenance work on provincial and municipal works be handled by qualified registrants under this act, in so far as it applies.

Further necessary provisions of this act include professional qualifications necessary for registration, discipline and penalties, formation of partnerships, and exemptions.

All of the above provisions will be found assembled in the accompanying draft act. The ancillary act here submitted refers to structural engineers, it being understood that the idea is to provide for additional ancillary acts of the same general type, referring to architects, electrical engineers, etc., and included in the general act as Part One, Part Two, etc. It will be noted that a number of the clauses in this draft act have been taken bodily from the proposed professional act prepared by the special legislation committee of the Engineering Institute of Canada. While this

draft act is a model piece of legislation of its kind, it was not analyzed and discussed in this report because it is essentially class legislation; it is only susceptible of comparison as a whole with the draft act herewith submitted.

In conclusion, the members of the Status Committee wish to point out that the subject of this report has so many complex and intangible ramifications, and is so vulnerable as related to existing legislation and public sentiment, that they do not presume to impose their views on their professional colleagues as the last word in engineering legislation. Their best hope is that there may be sufficient of interest in this report to prompt the various organizations represented by the Joint Committee to combine their energies and thrash out the issue to a definite conclusion.

PROPOSED DRAFT

An act to regulate the practice of professions and allied technical occupations, and to provide for the registration of persons engaged in practising the same.

Part One

HIS MAJESTY, by and with the consent of the legislative assembly of the Province of , enacts as follows:—

1. This act may be cited as "The Professional Registration Act."

2. There is hereby created a Department of Registration, which shall be under the jurisdiction of the minister of education of the Province of , and which shall be presided over by an appointee of the said minister, who shall have the status of a deputy minister, and who shall be styled the "Director of Registration."

3. It shall be the duty of the minister under this act—

(a) To administer and enforce laws relating to the regulation of specific professions and technical occupations.

(b) To establish rules and regulations for the proper administering of such laws, and for the fair and impartial examination of candidates for registration.

(c) To establish and control the standards of preliminary education necessary for admission to training schools, colleges and universities.

(d) To provide, on appeal, for the re-examination of candidates, and for rehearings in the case of action being taken to revoke a license or certificate or impose a penalty, when it appears that full justice has not been done.

(e) In all matters relative to the interpretation and administration of this act or any ancillary act, to give due and proper consideration to the representations and advice of members of the respective professions and technical occupations or of accredited organizations therein.

4. Within thirty days after any ancillary act relating to the regulation of any specific profession goes into effect, the minister shall appoint a board of examiners consisting of not less than three and not more than five members, and shall designate the chairman thereof. Tenure of office shall be so regulated that there shall not be more than one regular appointment to the board in any one year. Should a vacancy occur for any reason other than the expiry of a regular term of office, the minister shall fill the vacancy for the unexpired term, but otherwise subject to the rules governing regular appointments.

5. Members of board of examiners shall not receive compensation for their services, but shall be reimbursed for travelling and other actual expenses arising out of the performance of their duties under this act, and also for clerical and other assistance.

6. Ancillary legislation for the regulation of any specific profession, technical occupation, or branch thereof, may be introduced (a) on the initiative of the minister of education, should he consider such procedure necessary in the public interest; or (b) by request, through the minister of education, of a majority of the persons engaged in the practice of such profession, technical occupation, or branch thereof.

All such legislation shall be of the same general form as the ancillary act included herein as Part Two.

7. Pending the ratification of the appropriate ancillary act by the legislative assembly, any profession, technical occupation or branch thereof may meantime be made subject to the terms of the Professional Registration Act at the request of the minister of education and by consent of the lieutenant-governor-in-council.

8. All certificates, licenses and other authorities shall be issued by the Department of Registration, over the signature of the director, and with the seal of the department attached.

9. The provisions of this act shall not be enforceable in respect of the practice of law, medicine, dentistry or surveying so long as the laws now regulating such professions and occupations continue in force, or otherwise than through the provisions of sub-section (b), section 6, of this act.

Part Two—Ancillary Act

An act to regulate the practice of structural engineering and to provide for the registration of structural engineers.

HIS MAJESTY, by and with the consent of the legislative assembly of the Province of , enacts as follows:—

1. This act shall be cited as "The Structural Engineers' Registration Act."

2. In this act, unless the context otherwise distinctly indicates:—

(a) The word "minister" shall mean the minister of education of the Province of .

(b) The word "department" shall mean the Department of Registration.

(c) The word "director" shall mean the director of the Department of Registration.

(d) The word "board" shall mean the board of examiners appointed under the provisions of the Professional Registration Act.

3. On and after the date upon which this act goes into effect it shall be unlawful for any person to practise, or attempt to practise, structural engineering in the Province of without a certificate of registration or license to practise under the title of registered structural engineer, as issued by the Department of Registration under the provisions of the Professional Registration Act.

4. The following persons and things are exempt from the terms of this act:—

(a) Draftsmen, students, clerks of work, superintendents and other assistants of registered structural engineers, not taking responsibility for their work other than to their immediate superiors.

(b) Superintendents of construction in the pay of the owner when acting under the immediate supervision of a registered structural engineer.

(c) Any person, mechanic or builder, when making plans or specifications for, or supervising the construction, enlargement or alteration of, any structure or building which is to be constructed by himself or his employees for his own use.

(d) Any corporation preparing plans and specifications, and constructing, erecting or building engineering, industrial or monumental structures under the supervision of the corporation, provided the chief executive officer of the corporation, or the officer who immediately supervises the preparation of the said plans and specifications, and the building of such structures, is a registered structural engineer.

(e) Any person employed in actual service in His Majesty's naval, military or aerial service.

5. For the purpose of this act the board of examiners shall consist of five members, one of whom shall be a professor or associate professor of structural engineering in the University of , and the other four members registered structural engineers in good standing, who have had not less than ten years' experience in their profession and who have resided continuously in the Province of not less than five years.

6. A person is qualified to receive a certificate of registration as a structural engineer, without examination:—

(a) Who can prove to the satisfaction of the board, within one year of making application for registration, that he is a resident of the Province of at the date of the passing of this act, and who is at that date, and has

been for not less than five years previously, practising as a structural engineer.

(b) Who may come to reside in the Province of , and who at such time is a duly registered structural engineer under any similar act in any other province of Canada; provided that he shall present credentials as to his good standing satisfactory to the board, together with an application for transfer of registry endorsed by the proper administrative officer of such other province.

(c) Who submits proof, satisfactory to the board, of qualifications possessed by virtue of experience, training, or examination by any other examining body of recognized standing.

7. Otherwise than as provided under section 6 of this act, all candidates for admission to registration must be at least twenty-three years of age, and must have been engaged for eight years in some branch or branches of structural engineering, and for at least six years of such term in the employ of one or more structural engineers of recognized standing; provided, that in the case of a graduate from a recognized engineering college, the full period of such service shall be reduced to six years, which period will include his term of instruction.

8. Candidates for admission to registration under the terms of section 7 of this act shall submit to an oral and written examination before the board on the theory and practice of engineering, specializing in one or more of the various branches if they so desire.

A candidate failing on examination may, after an interval of not less than one year, be re-examined if he so desires.

9. Examinations shall be held as often and at such places as the minister may direct, and the scope thereof and the methods of procedure shall be fixed by the board, subject to the approval of the minister.

10. Any person not residing in the Province of who is a registered structural engineer under a similar law of any other province of the Dominion of Canada, may obtain from the director a non-resident license to practise as a structural engineer in the Province of upon production of evidence of his registry in such other province, and upon payment of a fee, the amount of which shall be fixed by the board. In the event of such person being unable, by reason of emergency or neglect on the part of the director, or for any other good and sufficient reason, to obtain such license within three months of his making application therefor, he shall be entitled to practise as a structural engineer in the province for such period of three months without holding such license.

11. Any person who is employed as an engineer by a public service corporation, a private corporation, public utilities or government department, whose business is normally carried on in two or more of the provinces of Canada, and who is by reason of his employment required to practise as a structural engineer in other provinces than that of his residence, may so practise in the Province of without holding a non-resident license, or payment of a fee, providing such person can, on demand of the board, produce credentials satisfactory to the board, showing that he is a registered structural engineer under a similar law of some other province of Canada. It shall be the duty of such person to produce such credentials whenever so required by the board; provided, that any structural engineer who is a resident of some other province of Canada, in which there is no registration or similar law, may obtain a license to practise, subject to the discretion of the board.

12. Any person who is not a resident of Canada, but who is a member of any engineering or technical organization or society of standing recognized by the board, may obtain a license to act in an advisory or consultative capacity to, or with, a registered structural engineer; provided, that reciprocal privileges can be accorded to registrants under this act.

13. Structural engineers practising in the Province of who were accepted for active overseas service in the War of 1914-18, in the forces of Great Britain, or any of her allies, shall be entitled to registration under the terms of sub-section "a" of section 6 of this act.

14. In the case of two or more persons carrying on practice as structural engineers in co-partnership, only such members as are registered or licensed under this act shall individually assume the function of a structural engineer. One or more registered structural engineers may lawfully enter into partnership with one or more registered practitioners of any other class.

15. No registered structural engineer shall be barred, under any of the terms of this act, from applying for registration, and being registered, pursuant to the provisions of any other registration act which may now or hereafter be in force in the Province of .

16. The board shall appoint a secretary and adopt rules and regulations for its own organization, and for the examination and classification of candidates for registration, and the issue of certificates thereto, and for carrying out the provisions of this act, and may amend, modify and repeal such rules and regulations from time to time. Such rules and regulations and any amendments thereto shall be subject to the approval of the minister.

17. The board shall at its discretion determine whether the experience and qualifications of any applicant are such as to make him eligible for examination and registration as a structural engineer, and shall reject or refer elsewhere any application which, in its opinion, does not fall within this category.

18. All moneys and fees collected or received under this act shall be properly recorded and receipted for and deposited with the provincial treasurer, who shall keep the same in a separate fund to be drawn against only for the expenses of the board.

19. All moneys expended by the board shall be paid through the provincial treasurer on properly drawn vouchers, signed by the chairman and secretary of the board.

20. Persons desiring to obtain a certificate or license shall apply therefor to the director, in writing, upon blanks prepared and furnished by the department. Each application shall be accompanied by proof of the particular qualifications required of the applicant, and shall be verified by the applicant under oath.

When the provisions of this act have been complied with, the director, on report of the board, will issue to the successful applicant a certificate of registration or a license, as the case may be.

21. Every registrant or licensee under this act shall display his certificate or license in a conspicuous place in his principal office or place of business or employment.

Every registered structural engineer shall have a seal, the impression of which shall contain his name and the words, "Registered Structural Engineer, Province of ," with which he shall stamp all documents and plans.

22. Every registered structural engineer who continues in active practice shall, annually, on or before a date to be fixed by the board, renew his certificate of registration, or license, and pay the prescribed renewal fee. An expired certificate may be restored, at the discretion of the board, by the payment of a restoration fee.

A registered structural engineer who retires from active practice for not more than five years may renew his certificate upon payment of all lapsed renewal fees.

23. The board shall from time to time fix the scale of fees to be charged for the examination and registration of applicants, for the issue of certificates and licenses, for the renewal of certificates and licenses, and for the restoration of lapsed certificates and licenses, such charges to be at all times subject to the approval of the minister.

All fees shall be paid in advance of the issue of any certificate or license, and no such certificate or license shall be considered in force while any renewal or penalty obligation is charged against it.

24. The board may by a three-fifths vote revoke any certificate or license upon written notification to the holder

thereof, giving him not less than thirty days' notice of an opportunity for a hearing, upon proof that such certificate has been obtained by fraud or misrepresentation, or upon proof that the holder of such certificate or license has been guilty of malfeasance or gross incompetency in the exercise of his profession.

25. The department shall keep a record, which shall be open to public inspection at all reasonable times, of its proceedings relative to the issuance, refusal, renewal, suspension and revocation of certificates and licenses. This record shall also contain the name, number, place of business and residence, and date and number of the certificate or license, of every registrant and licensee with whom the board has dealt.

25. Each of the following acts constitutes a misdemeanor, punishable upon conviction by a fine of not less than $ nor more than $:—

(a) The practice of structural engineering, or an attempt to practise structural engineering, without a certificate of registration as a registered structural engineer, or a license issued under the several provisions of this act; each day of so practising, or attempting to so practise, shall constitute a separate offence.

(b) The making of any wilfully false oath or affirmation whenever an oath or affirmation is required under the terms of this act.

(c) The affixing of a registered structural engineer's seal to any plans, specifications, estimates or drawings which have not been prepared by him or under his immediate personal supervision.

(d) The violation of the provisions of section 21 of this act.

All fines and penalties shall inure to the Department of Registration, and shall be recoverable with costs under the provisions of the law respecting summary convictions.

27. On and after a date six months subsequent to the date upon which this act comes into effect, neither the province, nor any county, township, municipality or village shall engage in the construction or maintenance of any public work of a structural engineering nature unless the plans, specifications and estimates have been prepared and the construction supervised by a registered structural engineer with qualifications appertaining to such work; provided that nothing in this section of the act shall apply to such public work if the estimated cost for the completion of the same does not exceed two thousand dollars.

28. Any person entitled to be registered under this act who shall neglect or omit to be so registered shall not be entitled to the benefits and protection thereof while such neglect or omission shall continue.

29. No provisions of this act having to do with penalties and restrictions shall be operative until one year after the passing of the same.

The American Association of Engineers has issued the following bulletin: "Attention is directed to Senate bill 2507, providing for a department of public health in the United States government. The bill authorizes a secretary of public health; a first assistant secretary, who shall be 'a man trained in medical science and eminent as an authority on public health and sanitation problems; a second assistant secretary, who shall be a man expert in the science of vital statistics and public health; and a third assistant secretary, who shall be a woman trained in the science of medicine or nursing and of public health.' Without entering into the discussion of the necessity and desirability of a department of public health, it seems necessary that such a department should be provided with an engineer trained and experienced in sanitary engineering. The problems of sanitary work are less medical than engineering. The American Association of Engineers, in pursuance of its policy to give attention to legislation affecting engineers, is conferring with prominent sanitary engineers of the country in regard to the bill's lack of provision for sanitary engineering services."

ROADS OF BRITISH COLUMBIA*

BRITISH COLUMBIA has approximately 14,600 miles of road open for traffic in the unorganized districts—namely, outside of incorporated municipalities. These roads have been constructed and are now maintained at the sole expense of the Crown. About 5,000 miles of the highways may be classified as main trunk roads, subject to a heavy mixed traffic of motor-trucks, touring-cars, ore-wagons, lumber-wagons, and the more ordinary traffic of farming communities. There are also about 5,000 miles of second-class road, which carry less volume of traffic, but which normally have to support the very heavy loads connected with mining, logging and other industries. The remaining roads are generally merely roads of access, subject to little traffic, and which, though costly to construct, especially in the mountainous or heavily timbered sections, are generally fairly cheap to maintain. In addition to the roads proper —that is, roads for ordinary wheeled vehicles—there are over 8,000 miles of trail, many of which in course of time will be widened out and improved, so as to form finally a part of the highway system.

Sixty Miles of Bridges

In connection with the provincial highways there are nearly 60 miles of bridges, of which nearly 3 miles are steel structures, built either purely for highway purposes, or built as composite highway and railway bridges, in association with one of the several railway companies. At least 13 miles of British Columbia's bridges are timbered truss spans, the remainder being timber trestles.

The provincial government has also installed and maintained 48 ferries, of which the majority provide a free service. There are also 3 subsidized steamboat services plying periodically on the interior lakes.

Within organized areas the provincial government has given material assistance to the various rural municipalities in connection with the construction of the trunk roads, and particularly in connection with the laying of improved surfaces. The formulation of a definite policy for dealing with work of this nature is under consideration by the administration.

Within the five years preceding 1919, the provincial government, by contribution or direct expenditure, has applied a sum of at least $600,000 towards such work, which, among other existing benefits, is represented by about 40 miles of paved surface within municipal areas.

The province of British Columbia embraces an area of 388,263 sq. miles, or, in other words, is practically as large as France, Spain, Portugal and the Netherlands. Of this area, less than ½ of 1% is organized into municipalities; while of the total population (approximately 400,000) only 14% is resident in the unorganized areas.

Extensive Banks of Gravel

Generally speaking, the rocks found in British Columbia are unsuitable for the construction of water-bound broken-stone roads, but as a compensation there are in the majority of sections extensive banks of gravel which provide suitable material for water-bound gravel roads, or, by selection, excellent material for concrete or other hard surface. The cost of special surfacing, except on the most heavily travelled ways in the neighborhood of towns, is, of course, prohibitive, but careful experiments are being made of surface treatment of ordinary gravel roads, and in many other directions, with the object of determining upon a form of construction suitable to each locality, and which, taking the first cost, maintenance charges and quality of surface into account, will be very greatly superior to the class of road which has so far been built in the outlying districts.

The public works department, which is responsible for the highways of the province, is thoroughly alive to the necessity of further extending the highway system for the benefit, not merely of the province, but of Canada as a whole. The necessity of intercommunication by road with

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*From Handbook of British Columbia, published (1919) by the Legislative Assembly, Victoria, B.C.

the rest of Canada and with the United States has given definite form to the plans. A very thorough inquiry is being made to determine beyond dispute as to what—from every point of view—will be the best route for a trans-provincial highway, as far as it affects British Columbia.

There is a highway leading from Alberni, at the head of the Alberni canal, Vancouver island, down through Nanaimo to Victoria; thence by steamer to Vancouver; then south across the Fraser river and up the left bank of this river to Hope. Improvements to this road have been carried out from time to time, and there does not remain a great deal of work to be done to make this section a thoroughly first-class highway. At Hope it becomes necessary to cross the coast range of mountains by one of three routes—either up the canyon of the Fraser river to Kamloops; up the Coquihalla valley and down the Coldwater to Merritt, and thence to Kamloops; or up the Silver creek valley and down the Roche river to Princeton.

Some Prominent Highways

The Silver creek route to Princeton, and its continuation, would be an excellent highway, but one which will require a considerable amount of work to complete. From Princeton to Cascade via Fairview, Greenwood and Grand Forks is a good road, and the construction of approximately 30 miles of road from Cascade to Rossland was decided upon early this year. At this time a fairly good road was being used from Rossland to Nelson. From the latter point a ferry-steamer is taken to Kootenay Landing, and from Creston the remainder of the highway leading through Cranbrook, Waldo, and Fernie to Crowsnest is completed and will not be a difficult matter to improve.

With regard to the other roads of the province, there is a heavily travelled road leading in a northerly direction from Ashcroft, through Clinton and Soda creek, to Quesnel. From there the road to Fort George will require to be located and built, as the old route is not desirable. Within a very short time it would be possible to complete the road leading west from Fort George along the Nechako river to Fort Fraser; thence up the Endako river to Burnt creek, and then down the Bulkley river to Hazelton.

The provincial government has also a road leading from Waldo, near Fernie, up the Kootenay river to Columbia lake, and thence along the Columbia river to Golden.

Banff-Windermere Road

There is another projected highway known as the Banff-Windermere road, which is destined to link up the east Kootenays with western Alberta. The route of this highway commences at Sinclair, on the Kootenay river valley road north of Windermere, proceeds along Sinclair creek to the Kootenay river valley; thence along the Vermilion river to the Vermilion pass (elevation 4,662 ft.) at the Alberta boundary. Of this road about 23 miles was constructed between the years 1912 and 1914, leaving about 48 miles to complete. Early in 1919 the uncompleted section was taken over by the Dominion government, who entered into an agreement with the British Columbia government to complete the road before the expiration of 4 years. This projected highway is situated midst magnificent mountain and valley scenery, a large area of which is being reserved for park purposes, and will eventually afford access to the Banff national park in Alberta.

Some idea of the magnitude of the work carried out upon this highway system may be given by stating that for the ten years preceding 1919, the expenditure upon extension, improvement and repair to the roads, trails and bridges in British Columbia has been nearly $3,000,000 annually.

It is anticipated that the Lethbridge southeastern irrigation project embracing some 350,000 acres, of which the two big natural reservoirs, known as the Milk River reservoir and the Raymond reservoir form a part, will cost between $3,000,000 and $4,000,000. H. B. Muckleston is now preparing estimates.

Letters to the Editor

DRIFTING SAND FILTRATION IN TORONTO

Sir,—For a variety of reasons the writer is particularly interested in Mr. Howard's paper on drifting sand filtration in Toronto, published in the October 2nd issue of *The Canadian Engineer*. In the first place the process is a radical departure from long established practices in water purification; and, second, the drifting sand filter plant at Toronto has ever been enveloped in a fog of uncertainty respecting its cost of operation and practical performances.

In the winter of 1913-14 the writer was preparing a monograph for the American Water Works Association entitled, "Present-Day Water Filtration Practice," and learning of the probable decision on the part of the Toronto authorities to adopt the ver Mehr drifting sand system in the proposed 60,000,000-gal. (Imperial) extension to the existing slow sand system at that place, sought to obtain reliable information about it, that he might refer to it in his then forthcoming article on water filtration matters in general. He learned that Sir Alexander Binnie was alleged to be an advocate of the process, and as the time was short before his article went to press, he cabled Sir Alexander for a statement regarding it. Sir Alexander replied that the only plant of this type he had seen was a small installation in Wales, but that he was impressed by it and thought highly of its possibilities. Correspondence with certain public officials in Toronto, and even personal inquiry on the ground, developed only the same line of indefinite information.

Prior to May, 1913, a test plant having a daily capacity of 500,000 Imperial gallons was installed by the ver Mehr company near the old West Toronto pumping station, and on May 21st, 1913, turned over to the city authorities for official test. The results of this test were reported on by George G. Nasmith and F. Adams, of the Department of Public Health, Toronto, in an article which appeared in *The Canadian Engineer* for April 8th, 1915. This test was run between the dates of May 21st, 1913, and June 27th, 1913, and upon the results then obtained, and the recommendations of Dr. Nasmith, the ver Mehr company was permitted to put in a bid for the 60,000,000-gal. installation. Of the four bids tendered, the ver Mehr bid was $1,096,000 as against the other three of $1,177,000, $1,197,000 and $1,750,000 respectively, and the contract went to the low bidder

From the time the test plant was installed in May, 1913, until the present day the writer has endeavored to obtain information relative to the cost of operation and maintenance of the new filtration works, but his efforts have thus far been without definite result. The 1915 article by Dr. Nasmith was scrutinized in vain for light on this important point, and it is with regret that even at this late date Mr. Howard seems unable to give the profession any information on this vital phase of the matter. In reply to a question by Col. Longley, he sweepingly dismisses the subject with the reply that "there are no figures available as to cost of operation." Personally the writer does not see how any discussion of the merits of the drifting sand filter can be of definite utility until some one is ambitious enough to relate the whole story and advise the public, not what this plant cost to build as compared with what either a slow sand or the established type of rapid sand system might have cost, even going so far as to grant that all three would produce an equally satisfactory effluent, but what are the actual costs of operation and maintenance.

A somewhat mysterious phase in operating results was described by Mr. Howard at the last annual meeting of the New England Water Works Association. In reply to a question by Mr. Caird relative to whether alum passes the filter, Mr. Howard states that "there is a slight trace of aluminum hydrate in the filtered water." He further said:—

"We experimented by passing the filtered water through

very fine filter papers and found that the hydrate was not decreased in any way."

Now this is suggestive. All water filtration men know that where aluminum hydrate is in suspension in water, that hydrate, no matter how finely divided the particles may be, can be removed by passage through fine filter paper; that is, if the texture is fine enough and there are enough thicknesses of the paper. If the resulting filtrate then reacts alum, the presence of undecomposed alum is proved, and not aluminum hydrate. All this suggests that as a sequence of a practically negligible period of coagulation in this process, undecomposed alum may be passing the filters, later perhaps to become decomposed and form an undesirable deposit in the pipes, or to cloud the filtered water as it leaves the taps in the city. If not so decomposed, an active corrosive agent is thus present in the filter effluent. This point requires clearing up by Mr. Howard.

From the information before him, the writer is not prepared to accept without question the Toronto drifting sand filter as a reliably efficient and economical process of water purification.

It is ingenious, and seems to satisfy the Toronto authorities; but it is not apparent that the citizens of Toronto desire the drifting sand process at any cost, and it seems quite unusual that a plant which has been operated as long as has this one, should not have developed accurate costs, a statement of which the profession at large, and the taxpayers of Toronto assuredly, would appear to be justly entitled to.

When these figures are published, it is to be hoped that they will be so decisive as to set at rest, once and for all, the doubt now existing in the minds of a great many water works engineers respecting whether Toronto is actually receiving acceptable water purification service at reasonable cost.

GEORGE A. JOHNSON,
Colonel, Utilities Division,
Construction Division of the
United States Army

Washington, D.C., November 25th, 1919.

RECOVERY OF VALUABLE CONSTITUENTS OF GARBAGE

Sir,—The writer has read with much interest the article on various methods of garbage disposal by Samuel A. Greeley which appeared in last week's issue of your paper, and while agreeing with him on many of his points, yet his article leaves a rather one-sided impression on the mind of a layman, and as councils are oft-times made up of laymen and as Mr. Greeley has hinted at various methods of garbage disposal, such as feeding to hogs, sorting and reduction, it may be well to ask Mr. Greeley if he will be good enough, to write another article, giving some information, which he must be in possession of, such as spreading of disease amongst cattle and hogs by feeding them on garbage.

No doubt Mr. Greeley knows of many cases where epidemics have broken out among swine and cattle as a direct result of some one trying to make a few dollars by taking what is admitted to be the most filthy and unsanitary stuff and attempting to turn it into pork, beef, or anything else intended for human consumption.

If Mr. Greeley has not heard of any such cases as referred to, perhaps he will not mind writing to Kitchener, Ont., or to the Ontario Board of Health, Toronto.

Mr. Greeley also refers to the system of sorting, such as is done in "Buffalo, Rochester, Pittsburgh, Columbus and elsewhere," and admits that the revenue derived from the sale of such sorted material "does not usually much more than pay for the cost of operation."

But, Mr. Editor, is the dollar the most important item? Very few people have any desire even to poke their nose inside of a reduction plant of any kind, much less work in it. Take, for instance, the plant just outside of Detroit. Everybody who has travelled in the neighborhood of that plant can bear testimony to the very rich odors arising therefrom, even without going within a mile of the plant; and, sir, what right has any one for the sake of making a few dollars, to ask men and women to work under such conditions as must obtain, around any reduction plant, no matter what kind or where situated.

The ordinary refuse coming from a number of houses daily is of the most filthy kind, and contains many things that are indescribable. The writer has studied the question of garbage disposal for some years, and has reached just one conclusion: Burn it up, either in the open or in an incinerator, and do this just as soon as possible after the garbage leaves the house, as it only takes a few hours to produce maggots, flies and odors, all of which tend to make things unpleasant for any person handling house refuse.

Here are a few of the kind of goods the writer has seen brought to an incinerator practically every day in the year: Dead cats and dogs; decayed fish, poultry and all kinds of meat; filthy rags, which have often been used for bandages on all kind of sores; rotten vegetables, fruits and canned goods; and other filth not decent to mention. If any person does not believe this, he can prove it for himself by going into an incinerator or reduction plant—not for a few minutes, but staying there for a few hours—and the writer is convinced that once a person has done that, he will be of the opinion that incineration is the only sane, sanitary, sure way of dealing with garbage with the least possible chance of spreading disease and the greatest security for a healthy, sanitary and clean town or city.

J. G. PICKARD,
President, Canadian Incinerator
& Furnace Co., Ltd.

Toronto, December 1st, 1919.

The Engineer's Library

"COST KEEPING AND CONSTRUCTION ACCOUNTING"

By G. Ed. Ross, associate member of the Northwest Society of Highway Engineers, and assistant secretary, chief accountant and cost keeper of the Phez Co., Salem, Oregon; 172 pp. and cover, 5½ by 8¼ ins., cloth bound; price $2.50 net, post paid.

After a detailed review of the author's experiences, and testimonials to his system of cost accounting, there follow 42 pages of descriptive features which were used very satisfactorily, says the author, by the Oregon State Highway Department, of which he was formerly secretary and auditor. Pages 76 to 129 are devoted to illustrations and explanations of forms recommended. A chapter on organization follows, with a suggested organization chart. The volume concludes with a discussion of the value of good cost records and the field for competent cost accountants.

The author says: "I spent 12 years doing in large organizations what I have written about, and my book is an outline of what has been actually accomplished rather than a theoretical story of what ought to be done. It is a practical book from cover to cover, and sets forth a principle which is being used on many of the larger projects on the Pacific coast, as well as by some manufacturing firms and a great number of counties. I have attempted to handle the subject in as readable and interesting a manner as a technical subject of such a nature would warrant, and have woven into the narrative a little poetry and some statements of a general nature to get away from the dryness which frequently is found in such publications."

BRITISH ENGINEERING STANDARDS ASSOCIATION.—Thirteenth report of work accomplished, covering period from August 1st, 1917, to March 31st, 1919; 124 pages and paper cover, 5½ by 8½ ins.; published by the association at its office, 28 Victoria St., Westminster, S.W.1, Eng.

PLANNING AND DEVELOPMENT OF CITIES IN ONTARIO*

By Thomas Adams
Town Planning Adviser to the Dominion Cabinet

THE present Planning and Development Act of Ontario deals largely with planning as a matter of fixing the location and dealing with the widening, extension and relocation of highways and parkways. Its proper description should be a highway or street planning and development act. It does not deal with town planning on the broad lines of other town planning acts which have to do with the regulation of the use of land and the character of building development in cities, towns and rural areas.

The general object of an act should be to secure proper sanitary conditions, the economic use of land and amenity and convenience in connection with the laying out and development of land. Thus the first things to get are proper sanitary conditions, which include the consideration in advance of the facilities needed to supply land and buildings with economical means of drainage, sewerage, water supply, etc.

Under the question of amenity, which may be interpreted as agreeableness of surroundings, there would be comprised the prescribing of space about buildings and the character of buildings and their surroundings.

Conditions Influencing Highway Traffic

Under convenience, the main consideration is that of highways and streets, and particularly the provision of wider main thoroughfares. It is impossible, however, to deal with this question of convenience in relation to traffic without considering at the same time the height, density, setback and use of the buildings served by the streets or highways.

You can neither plan a street or highway system as if it were a separate thing from the building development of the city, nor unless you have previously taken into consideration the zoning of the city into factory, residential and other districts.

We cannot strain the word amenity too far. What I mean is that we cannot interfere to any great extent with vested interests in property merely to obtain an agreeable or picturesque effect. If, however, the industries of a city or district depend for their success on certain restrictions on private interests in property, we should not consider it unreasonable to make these restrictions. The only things that are beyond question in connection with the restriction of private interest in property for the public welfare are the things that relate to health.

We should move at certain minimum standards in regard to what are proper sanitary conditions in respect of air space around buildings. Having arrived at those minimum standards, we say they should be insisted upon by law and that no compensation should be payable, even if our insistence upon them means that there is a loss of capital or revenue to the owner of the land.

Proper Sanitary Conditions Essential

This distinction between things that interfere with the health and welfare of the community and the things that are merely necessary for convenience and beauty is recognized in all laws relating to compensation under British and American constitutions. It is recognized in all town planning laws, and because it permits so much to be done by way of regulating the use of the land without payment by the community for compensation to private interests, it makes it of additional importance that town planning schemes should have for one of their main objects the securing of proper sanitary conditions, amenity and air space.

The provisions of the Ontario act may be briefly described as follows:—

To enable cities to have some control over the land outside their boundaries, the act sets up a new area called the "urban zone." The area of this zone comprises the land within five miles of a city boundary on all sides, or within three miles of a town or village boundary. The act recognizes the subordination of a town or village to a city, or of a village to a town.

The objection to this feature of the act is the power it gives to one municipality to have jurisdiction within the area of another municipality without having first provided the means to permit the planning of the zone to be carried out by the municipality in direct control of the area, or by co-operation between the adjacent municipalities.

Scope of Powers Restricted

The act gives a city, town or village, power to prepare a general plan, but sets forth that such plan shall deal with the restricted purposes of highways, parkways, boulevards, parks, playgrounds and other public improvements. The plan is not required to show or deal with the relationship of the highways to the character, density, height and use of buildings on the abutting lots, nor is there any provision in the scheme for preparing a preliminary and tentative plan and submitting same to the board so that their approval can be obtained in advance of incurring the expense of getting a certified plan, making the subdivision conform to the general plan.

It is difficult to see what really important object is attained by such a plan that could not be obtained by means of by-laws, or at least that does not merely consist in getting streets properly connected. The fact that the scheme does not touch buildings and sanitary conditions means that the planning of the size and form of lots is of little utility. They may be planned for the wrong purpose even if it is the purpose most agreeable at the moment of planning to the city and the owner.

Not until the city or town is planned in regard to its building development and until the location and densities of its factory and residential areas are thought out, can any highway or lot planning be settled in a satisfactory manner.

Section 9 permits the control of the planning of streets on adjacent subdivisions, so that they will be treated as one and fit in with each other. This is useful if it were part of a comprehensive scheme of town planning.

Non-Elected Town Planning Commissions

The act also permits of the setting up of a town planning commission. This commission must be a body corporate and exercise all the powers under the act. Thus, we may create an undemocratic body to override in certain respects not only the municipality that creates it, but the municipalities within the urban zone which have had no part in creating it. Hamilton has hesitated to appoint such a commission because it would give power of administration to a non-elected body with no direct responsibility to the tax-payers. If Hamilton objects to creating a commission of its own selection to deal with the planning of its highways, how much more should the municipalities within five miles, but outside of Hamilton, object to a non-elected body having control of the planning of their subdivisions and highways.

In Ontario we need an act that will really be a planning and development act, and that will show greater recognition of the value of self-government.

It is, of course, essential that adjacent municipalities—whether cities, towns or townships—be made to co-operate in controlling the development of the suburban area that rings in our cities and towns. It may be necessary that the cities be given the power to plan these suburban areas, but they should only be permitted to exercise that power after it is demonstrated that the municipalities outside the boundaries are unwilling to exercise it themselves.

It is contended that the existing planning and development act does not meet the needs of cities such as Hamilton, London and Windsor, which have been giving consideration to the desirability of preparing comprehensive town plans. These cities want a great deal more than the power to control the subdivision of land in the zones lying within five miles of their boundaries. The value of this power to them is shown by the fact that they have taken no steps to give it

*Address delivered last week at the Southwestern Ontario Town Planning Conference.

effect. What these cities require may be summarized as follows:—

1. The present act should be modified so as to permit the municipalities in the urban zones, which lie outside of the cities and towns, to prepare their own schemes if they wish to do so, while retaining the power to the city or town to include the outside area in their scheme in the event of lack of co-operation of the outside authority to prepare its own scheme or a joint scheme.

2. A special official with town planning qualifications should be appointed under the act to assist the Railway and Municipal Board to administer the act and to advise local authorities.

3. Provision should be made requiring each municipal council to make a survey of its area and conditions, and provide for assistance being given by the Provincial government in the preparation of topographical maps of all districts which are in course of development.

4. Provision should be made for securing co-operation between municipal councils and owners of land so as to give permanent effect to restrictions on the use of land relating to such matters as building lines and use and character of buildings.

5. The following powers should be granted under the act to municipalities:—

(a) The suspension of any powers in the municipal act, subject to approval of the Railway and Municipal Board, so far as the suspension is necessary for the proper execution of any scheme.

(b) Power to remove or demolish buildings which may be erected in contravention of the provisions of a scheme, after the scheme has been approved, as well as after proper notice is given and while the scheme is being prepared.

(c) Provision, not only for paying compensation for injury to owners of property, but also for obtaining for the city half of the increased value given to any property by reason of benefits accruing to such property by the scheme.

(d) Power to prescribe certain areas to be used for dwelling houses, apartment houses, factories, warehouses, shops or stores, etc., and to fix the height and character of the buildings in these areas.

(e) Exemption for any city or town from claims for compensation in respect of any requirement of the scheme which restricts the use of land for the definite purpose of health of the inhabitants or the amenity of the district, e.g. in regard to fixing factory, business or residential areas, the space about buildings, the percentage of lots that can be covered with buildings, or in regard to the height, character and use of buildings so far as such exemption may be regarded as reasonable by the Railway and Municipal Board.

(f) Power to compulsorily acquire land the same way as under the housing act of the province, without cumbersome process of arbitration; and to acquire land in excess of the amount needed to widen a street or construct a new street through a developed area, and to re-sell such land after the improvement is made.

(g) Power to fix building lines and reserve land on unbuilt-upon areas for new main thoroughfares.

(h) Power to classify any land to be used for different kinds of agriculture, horticulture, open spaces, etc., and to recommend a special system of assessment in relation to such classification of uses.

(i) Power to prevent noxious trades, bill-boards, etc., where injurious to the surroundings.

(j) Power to rectify or alter any existing subdivisions, including the pooling of lands of several owners, and the roads and streets abutting or adjacent thereto; and to initiate the planning of the subdivision of land in advance of its being placed on sale for building purposes, for the purpose of bringing owners of adjacent lands into line with any comprehensive scheme.

(k) Power to prevent building on low-lying and unsanitary lands pending reclamation and until provided with sanitary arrangements at the expense of the owners.

(l) Power to obtain proper representation of the municipal councils on town planning commissions and limitation of spending power of commissions to the cost of preparing schemes. Expenditure on execution of schemes to be subject to approval of municipal councils.

(m) Power to classify roads or streets (after zoning into factory, business and residential districts) as follows:—

(1) Main arterial roads.

(2) Secondary roads, being roads for general or local traffic.

(3) Industrial roads for access to industrial districts.

(4) Residential roads, being roads used primarily for access to residences.

(5) Parkways or boulevards, being roads which serve the purpose of either a main or secondary road, a portion of which is dedicated for ornamental purposes, etc.

The Provincial government should be asked to incorporate provisions in the present act or to frame a new act to cover these requirements; and so framed as to permit local authorities to prepare comprehensive schemes of town planning.

ZONING CITIES FOR TO-MORROW*

By W. J. Donald
Secretary, Chamber of Commerce, Niagara Falls, N.Y.

THE zoning or districting of towns and cities is, to my mind not only an integral part of town planning but even the fundamental basis on which all town planning must rest. This becomes apparent when one defines zoning as the determination of the character and intensity of the use to which lands within any given area are to be put. To be sure, zoning has been carried on in Canadian and American cities with little or no reference to town planning, and town planning has frequently been attempted without detailed consideration of the purposes to which the area is to be put.

In order to preface further discussion by securing a clear understanding of what zoning actually is, it seems wise to explain in detail what one city, Niagara Falls, N.Y., proposes to do. One of the first projects undertaken after the preparation of the final city plan, was the adoption of a zoning scheme. Note that a city plan had been prepared or at least almost completed first. The zoning map which was prepared, frankly recognized the plan, and the use to which lands may be put in Niagara Falls will keep in mind the general plan. This zoning plan provides for different uses for different sections of the city, and for varying degrees of intensity of use in different sections. After all, city planning is fundamentally a recognition of the fact that there must be differentiation between different sections of a city.

The Niagara Falls plan provides for six classes of zones or districts, for which different conditions of use, height and area of buildings are provided.

1. Residence districts for single family dwellings only, occupying an area of not over 30% of the lot, not more than 45 ft. high, and with side lots of 10 ft.

2. Residence districts devoted to residence purposes including two-family and group houses for not more than ten families, occupying an area not over 50% of the lot, not over 45 ft. high, and with side lots of 10 ft.

3. Apartment house districts, devoted to apartment houses and "tenements," with a height not exceeding the width of the street on which they face.

4. Commercial districts devoted to retail and wholesale trade, and incidental industry, requiring not more than five employees.

5. Industrial districts in which so-called "light" industry, not emitting undesirable noise, fumes or smoke, are permitted.

6. Unrestricted districts in which any industry, however disagreeable or dangerous, may locate.

In any of these classes of districts, uses permitted in a more restricted district are allowed. For each class of district, there are refinements as to use, area and height of buildings which we need not discuss here, but which in the

*Address delivered last week at the Southwestern Ontario Town Planning Conference.

practical application of the proposed zoning ordinance, occasion a great deal of discussion and call for a great deal of careful consideration and careful and patient explanation and educational work.

The word "zoning" is doubtless somewhat misleading. I have already observed that in Canada some people think of it as some sort of procedure for controlling the growth of the environs of growing cities. I wish its application might be extended to cover such a purpose in American cities, but I think that more progress is likely to be made in that direction in Canada than in the United States. This use of the word originated in Germany, where districting efforts gradually assumed the character of zones, the care of which often proved to be the area within the original walled town. A glance at any zoning map in the United States would give little indication of "zoning" in the German sense, but our "zones" are merely districts varying widely in area and location.

Despite the effort of professional city planners to popularize the more accurate word "districting," the people where districting work has been carried on persist in using the word "zoning," so let the people rule. "Zoning" it shall be.

Dependence of Zoning on City Planning

It is worth recalling that the Niagara Falls zoning ordinance was prepared as an integral part of a city plan for Niagara Fals. Unfortunately, this is not true of all other cities. I do not believe that it is true of any Canadian city, with the possible exception of Halifax, or of most American cities. You will be interested to know, I am sure, that in America, Nova Scotia was first to provide for the districting of towns and cities—as early as 1904. In 1909, Los Angeles passed an ordinance controlling the use of lands, making the ordinance retroactive. That ordinance has been declared constitutional, not only by the Supreme Court of California, but also by the Supreme Court of the United States, as a proper exercise of the police power. Of course, many municipalities had long ago created fire and building districts in the interests of public safety, but the extension of districting to include health and general welfare has been of this recent origin.

When Berkeley, Cal., adopted an ordinance in 1913, it provided for an optional districting plan. The ordinance provided for a large number of residence districts and permitted the citizens to petition for restrictions. An Ontario law for cities of over 100,000 provides for the establishment of residence districts on petition from which apartments, industries, etc., are excluded. More recent state laws and city ordinances provide for the zoning of the whole town or city.

Now, it is evident that petition ordinances and laws, such as exist in Ontario, do not anticipate any ordered planning of a city. Districting done under such laws is purely spontaneous, undirected and sporadic. It may be actually unwise and undesirable, as experience in Berkeley has actually proven. Home-owning petitioners seem prone to ask too little for the protection of their neighborhoods, though some have been known to ask too much. The difficulty in both cases is that the petitions were not based on a considered and sound interpretation of town planning fundamentals.

Topographical Knowledge is Basic

Basic in any town-planning work is a knowledge of the topographical background on the basis of which the main lines of transportation are likely to be determined. The availability of water transportation is very likely to determine the location of industry, especially heavy industry. Industry seems to naturally seek low-lying lands and waterfronts. Residences seek higher and dry areas. Topographical conditions are certain to affect the direction of prevailing winds by which smoke and fumes are carried. Mountains and hills, lakes and rivers are likely to determine, in part, the location of parks and public recreation grounds. All of these factors, especially the location of railroads and industry, affect very definitely the use to which lands are likely to be put.

It is scarcely necessary to argue, therefore, that zoning is an integral part of city planning, and that if zoning does not happen to grow out of town planning, the preparation for zoning should be so intensive as to relate the work to every other phase of city building and particularly those phases which are affected directly by topographical features.

Zoning as Basis of Intensive Town Planning

But there are many phases of town planning that are of secondary importance and very dependent upon the character and intensity of the use to which lands are to be put. If we could tell in advance just how all the land in and about Hamilton will be used 5, 10 or 25 years hence, how much easier it would be to plan properly for parks and open spaces, school grounds and play grounds, sewers and water and gas mains, arterial streets and parkways, quiet residence streets, street car lines and industrial switching tracks and belt lines, as well as public buildings.

Presuming that having once determined on the main principles of a plan for the city, based on topographical and other natural conditions, it is possible to determine also with reasonable certainty, the likely economical use of all lands in the city, let us consider in detail a few advantages to be gained.

Consider for a moment the interrelation of all these uses. Having once determined the proper general location for heavy industries, it is then possible to plan for adequate water terminals and, possibly, industrial canals; for railway sidings, terminals and belt lines; for street ways properly paved and wide enough for heavy, slow-moving trucks; for sewers designed to carry off the refuse of industry; for water mains possibly carrying raw rather than filtered water.

Industrial Houses

But modern industry, despite so many labor-saving devices, still calls for labor. Industrial housing areas should be reasonably close to the industrial areas, so that workmen may walk to work, yet far enough away and in such direction that the evils of "nuisance" industry may be minimized. Residence sections determine the location, number and even character of schools and their grounds. Schools in industrial housing areas should most certainly be planned as community centres, and there is an especial need for adequate playground space surrounding them. Incidentally, it would be an excellent improvement if some sort of park might be interposed between industrial housing areas and the nearby industries where employment is found.

Streets

In turn, to preface the planning of streets by zoning the city, will result in important economies. Most cities have shown little or no discretion in the planning of streets. The humble owner of a home in a section largely occupied by working men must pay for pavement on a street as wide as that used by his motor-driving employer. It is a question whether streets in industrial housing areas should be paved at all. Indeed, it has been suggested that there should be no public traffic ways in front of working men's houses, but merely pathways for pedestrians and play space for children, while traffic to the street should be served only by a paved alley for delivery purposes.

Lots and Blocks

Along with uniformity of street widths and street improvement should go uniformity of the depth of lots and size of blocks. Industry frequently is handicapped by the smallness of blocks. Sometimes, they get round the difficulty by securing the privilege of blocking or closing streets which should be left open. In fairness to both, industry and the public interest should not come into conflict in such a fashion. The conflict should be anticipated by zoning. Industry has a right to know where it can expand economically without coming into conflict with public opinion or public rights.

Workmen in turn should not be required to buy lots that are unnecessarily deep and viciously narrow. Lots that are too deep represent an unnecessary expense to the indus-

trial wage-earner. Moreover, they are a constant invitation to the building of rear houses, another vice for which the working man pays, if not with cash, at least with life and blood.

Transportation

The intensity of the use to which land is put has a particular bearing on the question of the daily movement of the population, without going into questions of technique on the control of the area and height of buildings, or the legal questions involved; we may consider the significance of this question, as it affects the requirements of a city, especially transportation.

I believe it is the custom of every city outside of New York to crave a distinguishing skyscraper. As a matter of fact, New York investors in skyscrapers have long since become disillusioned, as the average high building in New York brings a return of about 2%. The first skyscraper pays excellently for a time—its offices are light and airy and highly desirable, but once flanked by others, the returns soon reach the unprofitable level. Excessively intensive use of land has actually proven uneconomical to the property owners responsible.

Intensive use of land is moreover a liability to the community. Lower Manhattan could not empty itself into its own streets. Intensive use of building lots should call for correspondingly wide streets. Europe does not build towers of Babel such as one finds in New York, and such as other cities imitate. Intensive use calls for a corresponding provision of land for open space—of land for streets on which pedestrian, wheeled and car traffic may be accommodated. It is especially related, therefore, to the provision of street car service.

As a matter of fact, zoning in New York City grew out of the evident necessity for limiting the heights of buildings. The Heights of Buildings Commission soon discovered that it would be necessary to discriminate between sections of the city in any effort to regulate heights. A zoning commission was the logical consequence. Limitations on the intensity of use have therefore a very direct bearing on other city planning problems. In particular, the limitations on the possibility of providing transportation demand limitations on the use of land.

Enough has been said to indicate that the zoning of a city—that is, the determination of the character and intensity of its use—has a very definite bearing on every phase of city planning.

Does Zoning Pay?

I think I ought to add that zoning is one of the fundamentals of city planning which, fortunately, costs nothing except the costs of administration. I believe, too, that by permitting a careful anticipation of the city's future needs, it saves the city thousands of dollars that would otherwise be wasted. If time were available, I should like to discuss how zoning protects and stabilizes property values, how it protects the property owner against depreciation and the refusal to renew loans, how it protects the moneylender who loans on property, and how in general it protects the valuation on which the city bases its taxes.

W. A. McLean, Deputy Minister of Highways for Ontario, in an address to the Electric Club, Toronto, gave an outline of the present highway situation in Ontario. The need of the province in this connection is, he said, for a system of highways with continuous maintenance which would be reasonably passable. Ontario might well, he thought, increase its expenditure on good roads, but, on the other hand, economy must be practised, and roads built in proportion to the traffic which they accommodate. Close to large cities, where there is a heavy concentration of traffic, construction must be heavy in proportion, while similar construction in rural districts would not be justified. It would be out of the question to adopt one type of roadway throughout the province. There are, he said, 142,000 miles of highway in Ontario, and a large proportion of this mileage is surfaced road.

ETHICAL AND PRACTICAL SIDES OF TOWN PLANNING*

By Noulan Cauchon
Consulting Engineer and Town Planner, Ottawa

THE basic idea in town planning is the ethical side of the question; that is, man's right to live and the necessity for the survival of the race. One cannot recall too frequently Ruskin's great saying that "there is no wealth but life."

The fulfilment of this principle is accomplished through the technique of economics, such as controlling transportation, width of streets, height of buildings, the area of lots which may be covered, and the cubical contents of the rooms and buildings thereon. These are all but means toward the end of securing sunlight and air and the other conditions which are indispensable to health and amenity; and in the final analysis to secure the highest efficiency in the unit of manpower and consequently the maximum of production.

This is the justification for town planning as understood to-day. The artistic side of it evolves as the truthful expression of the purpose in view.

90% of City Buildings Doomed

As is frequently reiterated, a city no more than an individual can live unto itself. It depends upon its environment for the nature of its development; that is why in our planning there should be no hard and fast line separating urban and rural conditions; the one should blend into the other; they are complementary to each other.

You should plan broadly and largely, and with vision to the measure of your faith in the future of the country, as that is the basic power sustaining the development of the city. While your plans should be exhaustive, they should only be carried out as your progress and needs warrant. You should not only plan the future extensions of your city towards the country, but you should also replan your existing city.

I believe that in twenty-five or thirty years, practically 90% of all the buildings existing in our Canadian cities will have disappeared and been replaced by others more suitable to the purpose. The buildings will have disappeared from one of three causes:—

First, a number of them will have fallen down.

Second, a number will have been burned down.

Third, others will have been torn down by reason of the development of the city demanding new construction to meet the economic necessity of greater earning power to carry the charges on the increased values of the land.

The problems of Hamilton are the problems of every other city and town in Ontario to the degree of their population and development, and what Hamilton is to be congratulated upon is the manner in which it has fearlessly tackled these problems and is seeking their solution.

Railway Problem Comes First

The first thing which must be tackled is the solution of the railway problem, which is a special one on its own merits in every locality, due to physical and other conditions. I have had the privilege of making, in collaboration with W. F. Tye, of Montreal, a report on the railway situation in Hamilton. This report was accepted unanimously by the city council of Hamilton, who are still fighting for its accomplishment. Subsequently I made a report to the Hamilton Plan Commission on the general development of the city, resting upon the economic conditions of the surrounding country.

The whole of Eastern Canada from Quebec westerly to about Brandon, Man., is absolutely dependent upon the United States for its supply of coal, and should that fail, or to the extent that it may fail, must our railways, our industries and even our home fires slacken to a point unpleasant to contemplate. The moral to be drawn from that is that we must develop our potential water power to lessen as much as possible in certain directions our dependence upon coal. But we

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*Address delivered last week at the Southwestern Ontario Town Planning Conference.

must be very careful in the development of that water-power that the capital cost of it must not approach the cost of development of steam power, or little will have been gained.

The trend of rural population in Canada from 1872 almost to date has continually increased towards the city, thus lessening the production from agriculture and increasing the cost of living. This has been my reason for advocating the settlement of returned soldiers and others upon lands around the cities and towns, where they may be induced to take up agricultural pursuits under intensive cultivation, the whilst enjoying the amenities of civilized life, good roads, doctors, churches, schools, and the greater efficiency which they and their families can thereby attain.

This principle and its application in Ontario and Quebec, with the further crop insurance and aid of irrigation, has been recommended for thorough investigation by the parliamentary committee which recently sat at Ottawa to consider Soldiers' Civil Re-establishment, and I trust that the proposal for the diversion of the Grand River towards Toronto, Hamilton and the Niagara Peninsula, will shortly be taken up for investigation. The map of the country just referred to, showing the proposed metropolitan district and the numerous towns within it, emphasizes the necessity of not only planning the individual towns, but also the relationship which there is between them from a transportation and a sanitary point of view.

[NOTE.—At this point Mr. Cauchon's formal address ended and he began to show slides, discussing each in informal manner. The following, therefore, is a general outline report, not verbatim, of the remainder of his speech.—EDITOR.]

Plans were shown of the proposed railway re-organization in the city of Hamilton, and the advantages of the uptown station were set forth. In this connection, Mr. Cauchon pointed out that the new by-law being submitted to the city of Hamilton for the Guelph and Galt Hydro Radial, seemed to assume that the station would be at Stuart street, in conjunction with the present Grand Trunk station at that point. The "Hydro" have accepted the common entrance of the Tye-Cauchon plan, but have not yet declared themselves upon the uptown station.

Attention was drawn to the newspaper rumors that the "Hydro" might require or expropriate the Dominion Power & Transmission Company's radials centering in Hamilton. In view of the acknowledged convenience of the uptown feature, both as regards the T.H. & B. station and the radial terminal, Mr. Cauchon asked what would happen if the latter were purchased by the "Hydro." Would they maintain two terminals, one at Stuart street where passengers would have to get off and pay an extra fare uptown, and maintain the present radial terminal, or would they attempt to abandon it and bring all the radials into the Stuart street station? He advised the citizens of Hamilton to see to it that they obtain the uptown station for both steam and radials.

Views were shown illustrating the proposed developments for Hamilton, including a view of the turning tracks in the New York Central station as demonstrating that the proposal for Hamilton was quite feasible and good in operation.

Railway Problems in Various Cities

Views of Ottawa were shown, illustrating the railway conditions there and the fact that trains come from the main line of the Grand Trunk 4,000 ft. to the Central Station and back out again,—a thousand feet greater each way than what is proposed for Hamilton, and lacking a greater facility that Hamilton will have in being able to operate its trains around the curve and out again instead of backing in and out.

Referring again to Hamilton, illustrations were shown of the proposed Mountain Road development in its economic and also its scenic advantages, the proposed widening of Ferguson Ave. from the station to the base of the Mountain Park, and the development of the old quarry into a stadium for sports. Under this plan 3% grades for haulage to the top of the mountain are secured, and a by-law is being submitted at the coming municipal election to provide for $50,000 as a beginning on these roads.

The railway problem in London, Ont., as reported upon by Mr. Cauchon, was fully illustrated and reasons given why, although the conditions were somewhat similar to Hamilton, owing to the differences in levels an elevated cross-town track seemed to him the best solution.

By way of interest, slides were shown of the plan of Delhi, India, which is an elaboration of diagonal streets; and a plan of Paris, showing Haussmann's work in the replanning of that city.

To illustrate the proper treatment of the relation of buildings to scenery in regard to public institutions on the Mountain brow, such as the new hospital, Mr. Cauchon showed views of Durham Cathedral, the Walls of Carcasonne in Southern France, the Alhambra of Granada, the Acropolis of Athens, a terrace at Amalfi in Southern Italy, and the great Dufferin Terrace at Quebec.

Niagara-to-Windsor Highway

Views of the proposed mountain-side highway from Niagara to Hamilton were shown, and the point emphasized that if a great highway were carried through Southwestern Ontario from Niagara to Windsor, it would form part of a great transcontinental highway from New York to Chicago. The evidence that this is the proper route for attracting American travel to Canada, he said, is that it is the speedway of the Michigan Central and American freight through Canada, by reason of its shortness.

Mr. Cauchon concluded his address by showing some views of Niagara Falls, N.Y., where the railways are acutely congested, and explained the solution which he had submitted at the request of the Chamber of Commerce. The keynote of this plan is the lowering of the crossing of the Niagara gorge by about thirty feet, enabling grade separation and better railway approach to the bridge on both the American and the Canadian sides, which, he said, would permanently relieve the congestion at the border.

GARDEN CITY'S LOW INFANT DEATH RATE*

FIFTEEN years ago a group of reformers built a new town on garden city principles, 34 miles from London, to prove, among other things, that a union of town and country life was possible and practicable, and that as a result there would be healthy children and the rate of infant mortality would be reduced.

The time of proof has come. "It is an interesting fact to record," says the Garden Cities and Town Planning Magazine, "that during the eventful and difficult year of 1918, the infant mortality rate in Letchworth was 30 per thousand births. This is the lowest figure it has ever reached (in 1917 it was 36) and is by no means due to a low birth rate."

A garden city is not a mere residential community. Herein it differs from the garden suburb. It is intended to be "a small town, organized for modern industry, of a size that makes possible a full measure of social life, surrounded by a permanent belt of rural land." It does not aim to be a bigger, but rather a better town, where the normal activities of life shall have the best chance of expression.

Dr. Helen MacMurchy recently stated that every year in Ontario nearly 10,000 children under the age of five go to their graves. A recent bulletin of the Toronto Bureau of Municipal Research states that during the last decade, through the activities of the Department of Public Health, the infant mortality of Toronto has been reduced from 182 per thousand in 1909 to 103 in 1918. The general rate for the whole of Canada was recently given as 140 per thousand; for Great Britain, 139; for Sweden, 96; for Norway, 86; for New Zealand, 76.

Considering the many factors that contribute to the destruction of child life, the fact that only 30 children out of every thousand failed to survive at Letchworth, during the year 1918, cannot fail to carry conviction of the soundness of town-planning principles to any fair-minded observer.

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*From Conservation.

TOWN PLANNING CONFERENCE AT HAMILTON

ABOUT 150 delegates (from municipalities, boards of trade and other organizations) to the third annual town planning conference of southwestern Ontario, assembled last Thursday and Friday at Hamilton, Ont.

Proceedings commenced on Thursday morning with the registration of delegates, and a meeting of the executive for the purpose of striking committees.

At the noon luncheon, Dr. Horace L. Brittain, Bureau of Municipal Research, Toronto, gave an address on "Citizen Co-operation and Government." Owing to the vaccination requirements enforced at the international boundary, Lawrence Veiller, secretary, National Housing Association, New York City, who was expected to speak, was unable to attend, and Thomas Adams, town planning adviser, Ottawa, spoke in his place, taking as his theme, "The Housing Situation from an International Standpoint."

Mr. Adams stated that the housing question was essentially international, for in every country there was a shortage of houses, and men were finding difficulty in obtaining places of abode. The question had become very acute during the war in the U.S.A., and the government had found it necessary to build houses for workmen employed in shipbuilding, munition plants, etc. Specialists had been sent to Great Britain to study the question, with the view to building permanent dwellings.

Millions Spent in United States

Under the auspices of the Housing Corporation, Department of Labor, controlled by Mr. Eidlitz, New York, $60,000,000 had been allotted to the United States Shipping Corporation, and $100,000,000 to the Labor Department to finance housing schemes, which had been started in all parts of the United States—in Philadelphia, Wilmington, Norfolk, Charleston, Portland, etc.

In his opinion, said Mr. Adams, the scheme which had obtained the best result in the creation of a garden suburb, was that at a village outside Camden, N.J.

The housing scheme had been started by the federal government under pressure, owing to war conditions, and unfortunately that same spirit of doing things only under compulsion still predominated, with the result that although $100,000,000 had been expended on good houses, congress had decreed that no more houses were to be built.

Contrasting conditions in Canada with those in the U.S.A., Thomas Adams declared that Canada had no housing policy during the war, but was now able to commence a policy of reconstruction without adopting extravagant housing schemes.

The housing policy in the Dominion is the result of co-operation between federal and provincial governments, and soon after the armistice, provincial governments were called into conference at Ottawa in order to draft legislation for good housing.

The federal government decided to loan $25,000,000, and an Order-in-Council of February 20th, 1919, gave the conditions of the loan, and recommended:—

Conditions of Federal Loan

1. That a provincial scheme of housing be prepared.
2. That a house should not cost more than (a) $3,500 when built of timber or brick veneer, and (b) $4,500 when built of brick, stone, or concrete.
3. That the period of loan be (a) 20 years, (b) 30 years.

That loan be made to housing associations having a dividend paying less than 6% to its shareholders, and to individuals owning lots.

The order further states that the loan should be made to assist returned soldiers; and is not applicable to anybody having an income exceeding $3,000 a year. Conditions are laid down specifying the minimum size of rooms, external light and air, and sanitary arrangements.

Legislation had been passed in all provinces to deal with the housing scheme, but it was futile to pass legislation and not carry it into effect with good administration. Ontario had made the most progress, and had appointed a Director of Housing, J. A. Ellis, responsible for the carrying out of the scheme, and Mr. Ellis had an architect and a town planner to assist him. A large number of municipalities were taking advantage of the scheme, and had spoken for the full amount of money available.

Ottawa was cited as having the best scheme in Canada, and Mr. Adams described how 22 acres of land had been purchased at $3,000 an acre, and divided into 168 lots. Streets were planned to suit traffic requirements, a high spot selected as a clubhouse, 1½ acres devoted to children's play-ground, 1 acre to a bowling green, and 1 acre as a public space for recreation. Each purchaser of a lot paid towards this arrangement, which was so satisfactory that every lot was sold in a short time.

To Counteract Social Unrest

Private enterprises, said Thomas Adams, never attempted to solve housing problems. The best way to counteract social unrest was to house people well, and this could best be done by effective town planning. The chief weakness in a municipality was its peak in expenditure, because no attempt had been made to apply business principles to the government of a city. Money spent on local improvements and developing land by proper planning, would help to keep down wasteful expenditures. Wasted pavements, sewers, and water mains in front of vacant lots, should be made revenue-producing by building houses upon these properties. Money spent on constructive municipal work, in building houses, developing a city on some lines, was justified even if it meant an increase in taxes. The peak should be kept down by directing expenditure along productive channels.

The speakers at the afternoon session were S. Baker, city clerk, London, whose address was on "Municipal Government and Reconstruction," Sir John Willison, and J. A. Ellis.

Sir John Willison said the best council a city could have was one in which every element was represented, including labor, women and capitalists, viz., a council which maintained a close co-operation with public life. Good government was a matter of good citizenship, and an educative body should be created, and an endeavor made to inculcate duties of citizenship in public and secondary schools. He did not think that the reason given by some citizens, that many good men refused to serve their city because of the criticism or treatment given public men by the press, was a true one. As a rule, the men most successful in private affairs made the best public representatives on account of their training and business experience.

Ninety-seven Municipalities Adopt Housing

J. A. Ellis told of the work of his department in connection with the Housing Act. The housing scheme, said Mr. Ellis, was a matter of reconstruction, and a very important matter for all municipalities.

Ninety-seven municipalities had adopted housing, 70 municipalities were now building, and 93 proposed building next year. All cities, with the exception of three, one of which was now passing a by-law, and all towns, had taken advantage of the scheme. Next spring, it was anticipated, 5,000 houses would be built. A stage had now been reached, where a number of houses had been built in many municipalities, and the public were able to see the kind of house they may expect to obtain. Efforts had always been made to have municipalities follow the best lines to obtain the best houses with the best results.

Two items were both cheap and common, namely, sunlight and fresh air. The bureau had aimed at obtaining reasonably sized rooms, proper windows, a reasonable amount of land round the house, with the house so placed as to obtain the maximum of fresh air and sunlight, and good sanitary conditions. The result had been that 95% of the houses built, were absolutely satisfactory and first class in every way.

Mr. Ellis stated that some weeks ago he went over 80 houses. The total amount of taxes, insurance and payments ranged for $26 to $32 a month. Houses of a similar class were rented at $35 to $40 a month, which proved that houses

could be bought cheaper under the housing scheme, than if they were rented.

He was strongly in favor of the scheme, as it encouraged thrift, and allowed families to be brought up in good sanitary homes, and he hoped that private houses built in the future will follow the plans and ideals of municipally-built houses under the housing scheme.

Several delegates took part in the ensuing discussion, J. P. Geoffrey, Galt, maintaining that the provincial fund would soon be exhausted, and not meet the situation during the next five or six years. He maintained that the only solution was the duplication in Ontario of the building and loan system in operation in Philadelphia, where there are 160 building associations.

He declared that recreation grounds and play-grounds were essential for contented young manhood, and said that 10% of the land in Galt is devoted to parks and playgrounds.

Thomas Adams expressed his satisfaction that it had been possible to obtain a special act allowing a city to manage itself as it wishes. Some of the causes of dissatisfaction in civic government were the numerous spending bodies. He considered it democratic that citizens should elect a council, who would in turn elected their own mayor, and favored a continuity of government, giving as an example, 18 aldermen in office for three years, six retiring each year. This system would assist in eliminating commissions, would centralize administrative power in one body, and give executive power to the city officials, who should draw salaries commensurate with their responsibilities.

Advocates Civic Research Bureaux

Dr. Brittain was invited by the chairman to make proposals as to action by the conference in general in carrying out suggestions made in his address earlier in the afternoon. Dr. Brittain suggested that cities of over 30,000, establish local bureaux, and co-operate with the Dominion Bureau of Research. By so doing, the Dominion bureau could retain the services of specialists such as engineers and auditors, who would visit the civic bureaux when required, and give expert advice.

Speaking at the evening session to a representative gathering of citizens, civic officials, members of the Board of Trade, and delegates, J. A. Ellis maintained that every municipality should have the right to govern itself, and shoul any municipality have a plan or scheme requiring legislation to make it effective, his personal opinion was that such legislation should be given. No government would refuse a popular demand, but it was essential to know definitely what was wanted.

The two addresses of the evening were given by Thomas Adams, town planning expert, and Noulan Cauchon, consulting engineer, Ottawa. Both addresses are printed in full upon other pages of this issue.

Will Interview Ontario Cabinet

FoHowing Mr. Adams' address, delegates from London, the Border cities, Brantford and Chatham, expressed their approval of the suggestions made in the address, and the meeting, by a unanimous standing vote, supported Mr. Coppley's resolution: "That this conference approves of the town planning scheme, and resolves that the chairman appoint a deputation representative of all municipalities to see the government with reference to the new legislation, and amendments as suggested by Thomas Adams."

Friday morning's session commenced with reading of the reports of the honorary and corresponding secretaries, and the consideration of resolutions recommended by the executive committee. The following is an extract from the report of the corresponding secretary:—

"The last town planning conference of southwestern Ontario was held in October, 1916. Remarkable developments have taken plaec since then along many lines, but provincial town planning has not developed with the times. Standing to-day and looking back three years since last we met, we see with a clearer vision than before the great need and the great importance of planning our cities, towns and rural communities, but we seem to be no nearer the accomplishment of our ends than at the last convention. Notwithstanding appearances, however, much foundation work has been accomplished during the last three years, and many towns have appointed town planning boards. I believe we are are now on the eve of greater accomplishments.

New Legislation Needed

"Lack of adequate legislation has also interfered seriously with local town planning progress. The Planning and Development Act of 1918, while a recognition of the importance of planning highways, urban zoning, organization of town planning boards, etc., has been found defective. When we came to apply the act in Hamilton, the city council was alarmed at the wide-open door to large expenditures, and refused to appoint a commission under the act.

"The Hamilton council refused to proceed under the act, and they were justified in their course of action. The Hamilton town planning board is not appointed under the act because the taxpayers are not sufficiently safeguarded, and consequently the board's hands are tied and we are in a large measure marking time. The town planning board in Hamilton is simply a committee of the council, without sufficient appropriation to carry on its work.

Object of Conference

"One object of this conference is eo educate the public and the municipal councils along town planning lines, to create public sentiment and bring it to bear upon the provincial parliament. We cannot magnify the importance of town planning too much, and in order to accomplish our ends we need the help of the women of this convention.

"Each municipality has its own peculiar problems, but in order to solve them, a comprehensive city or town plan should be secured, adopted, approved by a provincial board and registered. In Hamilton we are after such a city plan, which shall co-ordinate various very ambitious individual projects in the course of development. For example:—

"1. The harbor board is working on a vast harbor scheme preparing for a future seaboard town.

"2. The housing commission is building scores of up-to-date dwellings for workingmen, having all the conveniences.

"3. The parks board have hundreds of potential acres to develop for future generations.

"4. New railway plans have been projected by Messrs. Tye and Cauchon; these have been adopted by the city council, and stand ready to be worked out.

"5. Several millions of dollars have been voted as collateral security in connection with Hydro-radial lines, terminals, freight yards, etc.

"6. A highway commission has been appointed to lay out roadways which shall make Hamilton the hub of southwestern Ontario.

"7. A proposition is now before the city council, having in view the beautifying of the Mountain Face park, which is five miles long, and a most unique natural asset belonging to the city, which is awaiting development.

"There are narrow streets to widen, boulevards to build, slum conditions on the outskirts of the city to clean up, factory, commercial and residential districts to restrict. A city plan is absolutely necessary to remedy defects and to facilitate improvements, and yet up to date so many hindrances obstruct the forward movement that apparently we are no nearer attainment of a city plan than three years ago, when we met at our last convention.

Considerable discussion took place during the consideration of the resolutions, and the objection was raised that the conference was attempting to cover too wide a scope of municipal affairs.

A resolution was passed urging the department of education to provide for the education of children in the duties of citizenship. The convention also endorsed a suggestion that fire chiefs be instructed to address school children in fire prevention.

It was resolved that the town planning convention considers it imperative that no factories emitting smoke and noxious fumes be allowed to locate on the side of the municipality from which the prevailing wind blows, and demands the adoption of a by-law preventing the improper location of such factories.

A letter from the London Trades and Labor Council, asking that the conference use its efforts to have the housing commission's regulations made easier, and that provision be made for cheaper houses, provoked much argument, and it was decided to forward the letter without comment to the federal and provincial housing commission.

The speakers at the luncheon were: W. J. Donald, secretary, Chamber of Commerce, Niagara Falls, N.Y., whose address is published in full upon another page of this issue, Louis Black Duff, Welland, and Thomas Adams, who spoke on "Town Planning—Does it Pay?"

In the course of his speech, Mr. Adams said that the first thing to be considered in town planning was transportation, as the railways and waterways were with us and could not be moved. Having planned those, the next problem was the zoning of the city, dividing it into factory, business, and residential districts, but just as much respect should always be paid to agricultural developments outside, as to manufacturing elements inside a city. The Niagara peninsula should be considered as a whole in transportation and zoning questions. He maintained that there was absolutely no necessity to have subways or tunnels to carry traffic in Canada, provided the principles of town planning were carried out.

The first thing to be done was a survey of existing conditions with a view to obtaining data, and these facts, with their relation to each other should be considered by practical men. Science and practical experience should work side by side. It costs nothing to zone a city except the expenditure in preparing a scheme and its administration.

The conference was brought to a close at the afternoon session by papers on "Looking Ahead," by Mrs. Dunnington Grubb, landscape architect, Toronto, Mayor McBride, M.P.P., Brantford, and W. A. Crocket, M.P.P., Barton.

According to newspaper rumors, the Dominion government appears to be unwilling to allow the Hydro-Electric Power Commission of Ontario the privilege of constructing the proposed St. Lawrence canalization and power development. It is said that the government considers that the proposed work should be a federal undertaking.

Excavation work is well advanced for the extension which the Steel Company of Canada, Limited, are making to their bolt and nut building. This extension will provide an additional floor space of 60,600 sq. ft. The extra accommodation will be used partly for storage and shipping and partly to enlarge the facilities for the various manufacturing processes. The estimated cost of the work is $200,000. The new building will be four stories high, of reinforced concrete construction. F. G. Peden, of Montreal, is the architect, and the Anglin-Norcross Co., Ltd., of Montreal, have the general contract.

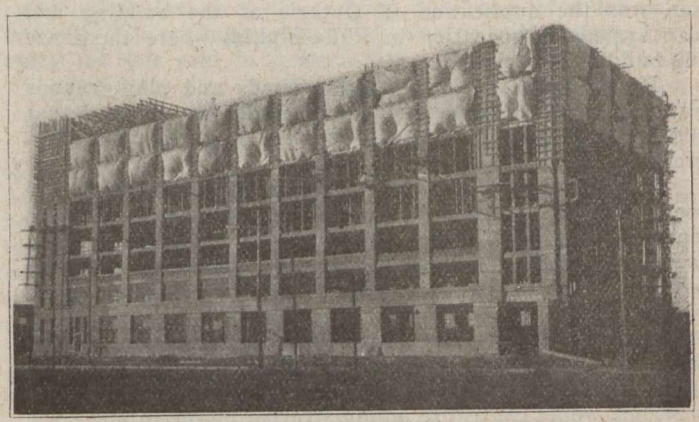
Three-quarters of a million dollars have been spent by the Administrative Commission of Montreal, during the present year, on permanent street works and repairs, according to a report given out by the Department of Public Works. A total of $519,903.43 has been spent on new paving. The following amounts have been expended on repairs: Street paving, $97,157.82; street crossings, $32,490.86; permanent sidewalks, $25,878.05; temporary sidewalks, $21,501.74; water-bound macadam, $64,022.04; levelling unpaved street, $13,842.26; oiling streets, $27,612.99; and repairs to bridges and tunnels, $11,904.44.

In an address to the members of the Peterboro Board of Trade, Thos. Adams, town planning adviser of the Dominion government, spoke of the housing problem and said that any town that offers bonuses to manufacturers shows signs of weakness. He said: "We have not solved the problem of social organization of industry. The present condition means strikes, slumps, disorganization, even among well-paid workers, a growing burden of taxation, rapidly increasing because we have no well-defined organization to plan our cities, as we do our industries. City planning has to do with transportation, streets, waterways and buildings. No streets should be less than 66 ft. wide. In the residential district 40 ft. is ample, but in the congested districts they should be 100 ft. wide."

CONCRETING IN COLD WEATHER

IN the October 23rd issue of *The Canadian Engineer*, there was published an article by A. E. Wells, of Chicago, president of Wells Bros. Construction Co. of Canada, Ltd., on the advantages that accrue to owners of buildings as a result of continuing concrete work during cold weather.

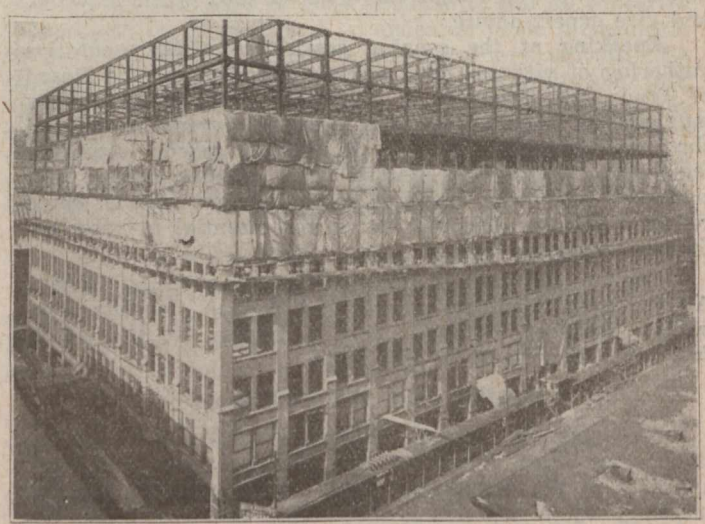
"Primarily the reason why building has been inactive in winter," says Mr. Wells, "is that concrete does not harden so rapidly when its temperature hovers near freezing. But



RAND, MCNALLY & CO.'S PUBLISHING PLANT

we heat our homes, offices and stores, and coal is a comparatively small operating cost. We are to-day able to enclose a structure, warm it with simple coke stoves, heat aggregates prior to mixing with Portland cement, and keep the concrete or mortar warm until hardening has occurred."

A few days ago Mr. Wells kindly mailed to *The Canadian Engineer* the two accompanying views showing how his firm has enclosed with tarpaulins the floors of buildings



REGINA WAREHOUSE, ROBERT SIMPSON CO., LTD.

upon which they desired to do concrete work in cold weather. The Regina warehouse of the Robert Simpson Co., Ltd., is entirely a reinforced concrete structure. The Rand, McNally & Co. publishing plant is a steel building with concrete floors and fireproofing.

J. B. Nicholson, Ltd., contractors, of Hamilton, Ont., are moving their head office to the Excelsior Life Bldg., Toronto, and are establishing a concrete-products plant at Toronto, although they intend to retain their present office and plant at Hamilton. The firm is specializing in the design and construction of circular reinforced concrete bins for coal, grain and oil storage.

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PRINCIPAL CONTENTS

INVESTIGATION OF CONCRETE-PROPORTIONING

TWO weeks ago eight engineers from various parts of the United States and Canada held what may prove to be one of the most important meetings in the history of concrete. Called as a special session of two sub-committees of the American Society for Testing Materials' concrete committee, this meeting is of historic interest in the engineering world in that it constituted the first definite co-operative step toward taking the proportioning of concrete materials out of the realm of the empirical and into the limits of science and certainty.

At the last annual meeting of the American Society for Testing Materials, Sanford E. Thompson, chairman of the committee on concrete and concrete aggregates, stated that there is no more important subject in civil engineering to-day than the finding of proper methods for proportioning concrete, and he intimated that it was high time that the guesswork be eliminated from plain and reinforced concrete construction. He argued that there is now a sufficient abundance of accurate data from independent sources to enable the committee to establish certain fundamental principles, the lack of which has hitherto caused most of the general fog surrounding the simplest problems in concrete proportioning, and he urged the society to take some definite steps along this path.

Largely as a result of Mr. Thompson's plea, the members of the concrete committee decided to try to establish whatever basic truths there may be underlying Prof. Abrams' fineness modulus and water-cement ratio theories and Mr. Edwards' surface area theory. Both of these gentlemen were expected to attend the Chicago conference, which was held at the Lewis Institute, November 17th and 18th, and Prof. Abrams was there, but unfortunately Mr. Edwards was snow-bound in Dakota while returning from an inspection of a bridge for the United States Bureau of Public Roads. The arguments and data on behalf of the surface area method were ably defended, however, by H. F. Gonnerman, first assistant to Prof. A. N. Talbot of the University of Illinois; A. T. Goldbeck, engineer of tests, U.S. Bureau of Public Roads; and Roderick B. Young, of the engineering laboratories, Hydro-Electric Power Commission of Ontario.

The Bureau of Standards, which has taken a prominent part in the various discussions that have centered around the fineness modulus and surface area methods, was represented by J. C. Pearson. The chairman of the meeting was Cloyd M. Chapman, engineer of tests, Westinghouse, Church, Kerr & Co., Inc., who has taken a very active interest in both methods, and whose laboratory has conducted a considerable number of tests. The other sub-committee members present were P. J. Freeman, of the Pittsburgh Testing Laboratories, and Prof. M. O. Withey, of the University of Wisconsin.

Every one of the eight above-mentioned engineers have at their disposal the most modern laboratory facilities for concrete research and tests, and are in the best possible position for accomplishing some really revolutionary results by co-operative effort,—joint interpretation of pooled experience.

As a result of the two-day conference, it was decided that these eight and several other outstanding laboratories should join hands in the carrying out of a definite program of tests which was formulated at the conference, and the results of which will very likely throw considerable light upon some of the points now disputed by the advocates of one or the other methods of proportioning, and may also demonstrate that the fineness modulus and surface area theories are not so diametrically opposed as their sponsors still appear to believe. At least one investigator, Roderick B. Young, of the Hydro-Electric Power Commission of Ontario, believes that these methods are in harmony on all essential points. He brought out some interesting evidence to support his belief in a valuable article, "Analysis of Concrete-Proportioning Theories," which was published in last week's issue of *The Canadian Engineer*. Mr. Young summed up very concisely the outstanding points of both methods, and showed how the Hydro-Electric Power Commission's tests substantiate both the surface area and water-cement ratio theories.

The present schedule of co-operative tests has been designed to cover all points in dispute and includes the use of stone, gravel and slag and various combinations of these three materials, so that the laws formulated may be entirely general.

REPORT OF J. C. T. O. STATUS COMMITTEE

SEVERAL months ago the Joint Committee of Technical Organizations appointed a status committee, with H. G. Acres, hydraulic engineer of the Hydro-Electric Power Commission of Ontario, as chairman. This committee has just presented its report, which is published in full in this issue. It recommends legislation based upon somewhat different lines than the bill which was recently drafted by a special committee of the Engineering Institute of Canada and which was intended to serve as model legislation to be introduced into the various provincial legislatures.

It is claimed that the basic difference between the J. C. T. O. and E. I. C. bills is that the former is popular legislation and the latter class legislation. As proof of the fact that the J. C. T. O. bill is popular legislation, it is pointed out that it is applicable to any profession or even trade if so found desirable.

The E. I. C. is said to have attempted to legalize the definition of engineer, whereas the J. C. T. O. bill gives wide authority to duly constituted boards to say who is and who is not an engineer, without requiring those passed as engineers to fit any prescribed definition. In other words, under the J. C. T. O. bill an electrical engineer, for example, would be an electrical engineer merely because he was recognized as such by the board of governors of the electrical

engineering profession in his province, and he would not be entitled to practise as an electrical engineer until he was so recognized.

The J. C. T. O. bill may have decided advantages as compared with the E. I. C. bill and it should receive the careful attention and close study of all members of the Engineering Institute of Canada. If, upon discussion, it appears to present better chances of being adopted by the provincial legislatures, and if it is fair to all engineers and fulfils the need for protection through legislation, then it is the bill that is wanted and the E. I. C. should not hesitate to support it in lieu of their own draft. The report has been forwarded by the J. C. T. O. to the officials of the various technical organizations represented on the J. C. T. O., and should now be discussed by the members of those organizations.

In his letter of transmissal accompanying the report, Mr. Acres says:—

"This report has been prepared at the cost of a considerable amount of discussion and research, and is the result of a number of meetings of the committee which were held from time to time throughout the past summer and early autumn. Owing to the season it was, of course, very difficult to get the members of the committee together, and in stating that the bulk of the committee work was done by Messrs. Hynes, McEvoy, Chipman and Le May, which is a fact, there is no hint of reproach, as I know personally that most, if not all, of the other members of the committee were out of town for practically the whole of the period above mentioned.

"Whatever value this report may have in the estimation of those for whom it has been prepared, it has been the result of the active and sympathetic interest taken in the matter by the gentlemen above named, and the thanks of the Joint Committee of Technical Organizations is due them in full measure."

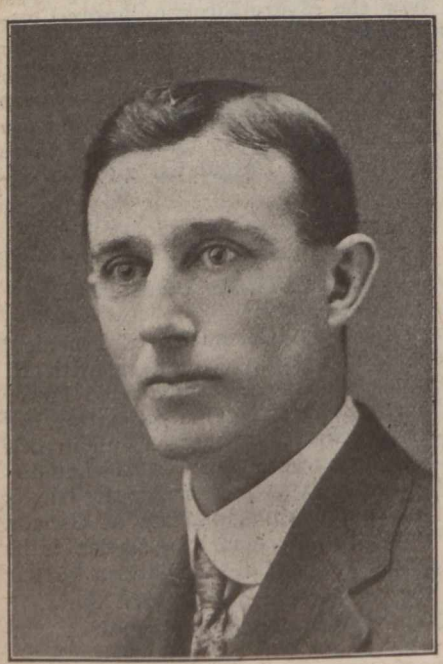
It will be observed by those who read the proposed bill, that Part Two is an ancillary act covering only structural engineers. The committee's idea is that Parts Three, Four, Five, etc., would be other ancillary acts exactly the same as Part Two excepting that Part Three could cover architects; Part Four, electrical engineers; Part Five, mining engineers; etc. An ancillary act would be passed for each profession in which the majority of members petitioned for registration; also for those professions in regard to which the minister of education might deem registration to be in the public interest.

The Status Committee does not appear to lay claim to any credit for originating the legislation which it advocates, as it is explained that the whole has been patterned largely upon legislation now in force in some parts of the United States.

It is understood, moreover, that the conclusions arrived at by the Status Committee as a whole do not necessarily represent the opinions of all of the individual members of the committee, but have merely been put forward in order to pave the way for discussion of controversial points upon which an agreeement must be reached before any united stand can be taken by the various technical organizations interested in the proposed legislation.

PERSONALS

WALTER SIDNEY HARVEY, who resigned last week from the engineering staff of the Toronto Harbor Commission in order to accept a position with Alexander Potter, consulting engineer, New York City, was born December 16th, 1880, at Swansea, Wales. Mr. Harvey was educated at St. Andrew's College, Swansea, and at the Swansea Technical College, and was then articled for three years to T. J. Scoones, consulting engineer, of Bristol and London. After completing his term as articled pupil, Mr. Harvey remained with Mr. Scoones for a further 2½ years as assistant engineer on the design and superintendence of construction of the following works: Gravity water system at Cheddar, Somerset; sea defence works at Barry, Wales; dry dock reconstruction at Bristol; and coaling station at St. Vincent, Cape Verde Islands, West Africa. From 1904-7 Mr. Harvey served as contractor's engineer for the British Insulated & Helsby Cables, Ltd., in charge of track work and street paving in connection with the Chesterfield electric tramways. Upon completion of this work he remained for a time with the Chesterfield corporation as chief assistant to the borough engineer in carrying out some double-tracking, road widening and sewer construction. He resigned from this position in order to become contractor's engineer for Robt. H. B. Néal, Ltd., in charge of the construction of sewerage works and pumping station at Weston-super-Mare, and of the widening of the William Wright dock at Hull. In November, 1910, Mr. Harvey came to Canada and joined the staff of the main drainage department, city of Toronto, on the design of storm sewers and interceptors. Six months later he went to Lethbridge, Alta., as assistant city engineer, subsequently becoming city engineer. In March, 1914, Mr. Harvey returned to the department of works, Toronto, as designing engineer of the sewer section. He resigned in May, 1918, to accept the position of construction engineer for the Leaside Munitions Co., Ltd., and was engaged in the construction of a 12-in. shell plant for the United States government. Although this plant was practically completed, it was not operated owing to the signing of the armistice. Last January Mr. Harvey completed all outstanding work for the Leaside Munitions Co., Ltd., and joined the engineering staff of the Toronto Harbor Commission as engineer of sewer design, and was engaged under the direction of Geo. T. Clark, designing engineer, in the preparation of schemes for storm and sanitary drainage for the water front development, and of designs for outlet extensions to the city's overflow sewers. Mr. Harvey's first work on Mr. Potter's staff will be at Warren, Ohio, where he will investigate the relative merits of several sources of water supply, appraise the present system and prepare plans and specifications for a new system. Mr. Harvey is an associate member of the Institution of Civil Engineers of Great Britain, and was the recipient of the 1908 Telford premium awarded by that institution. He is also an associate member of the Engineering Institute of Canada and for the past year has been secretary-treasurer of the Toronto branch and secretary of several of that branch's most important committees.



J. W. NELSON, who has been a member of the Board of Control of Ottawa, Ont., for many years, has resigned in order to accept an appointment as superintendent of streets, succeeding George Little, who gave up the position owing to ill-health.

NORMAN M. CAMPBELL, who has been associated with the Canadian Ingersoll-Rand Co., Ltd., for the past twenty years, has resigned his position as sales manager of that company, to take effect December 31st. He has been appointed managing-director of the General Combustion Co. of Canada, Ltd., manufacturers of industrial furnaces, with headquarters in the New Birks Bldg., Montreal.