MacVicar, M.P.P., Belmont, Ont.; Geo. E. Martin, highway engineer, Barrett Co., Chicago, Ill.; H. Wm. Meech, commissioner of public works, Lethbridge, Alta.; W. G. Mawhinney, municipal engineer, Selkirk, Man.

M. T. Nagle, vice-pres., Russell Grader Co., Minneapolis; W. P. Near, city engineer, St. Catharines, Ont.

Wm. Ord., manager, paving dept., Lakewood Engineering Co., Cleveland, Ohio; C. J. M. Osler, councillor, St. Claude, Man.; M. Ornal, councillor, Fannystella, Man.

R. H. Parsons, Montreal; Walter Parker, pres., Jefferson Highway Association, New Orleans; W. H. Pelham, Regina, Sask.; J. H. Putnam, sec.-treas., Ninette, Man.; J. A. Penrose, assist. engineer, Good Roads Board, Dauphin, Man.; E. A. Poulain, sec.-treas., Norwood, Man.; Alfred Pitt, pres., Central Canada Colonization and Highway Association, Dryden, Ont.

G. W. Robinson, engineer of projects, Bismarck, N.D.; J. R. Roberts, manager, paving dept., Barrett Co., Montreal, Que.; J. D. Ruttan, engineer, Fort Garry, Man.; J. D. Robertson, provincial engineer of highways, Edmonton, Alta.; W. G. Robertson, sec., Ontario Motor League, Lumsden Bldg., Toronto.

Col. W. D. Sohier, Mass. highway commissioner, Boston, Mass.; Wm. Smaill, chief engineer, Northern Construction Co., Vancouver; Geo. D. Sewell, M.P.P., R.R. 2, Waterford, Ont.; C. D. Smith, sales engineer, Lakewood Engineering Co., Minneapolis, Minn.; L. D. N. Stewart, Ontario government engineer, Collingwood, Ont.; W. H. Shillinglaw, municipal engineer, Brandon, Man.; Geo. A. Sherron, consulting engineer, Philadelphia, Pa.; A. P. Sandles, sec., Crushed Stone Association, Columbus, Ohio; H. Spenger, municipal engineer, Dauphin, Man.; O. T. Soole, sec.-treas., Elm Creek, Man.; David Smith, assist. engineer, Good Roads Association, Dauphin, Man.; W. J. Short, reeve, Shoal Lake, Man.; S. L. Squire, pres., Canadian Good Roads Association, 98 Albany Ave., Toronto.

W. E. Thomas, Box 1229, Brandon, Man.; W. C. Thompson, member Hamilton Suburban Highway Commission, Hamilton, Ont.; Geo. A. Toole, mayor, Kenora, Ont.

H. P. Urie, dist. engineer, province of Manitoba, Deloraine, Man.; J. E. Underwood, Murphy and Underwood, Saskatoon; K. J. Urquhart, Saskatoon.

H. S. VanScoyoc, manager, publicity dept., Canada Cement Co., Montreal; J. T. Vance, clerk of Wentworth Co., Hamilton.

R. E. Weeks, municipal engineer, Souris, Man.; C. R. Wheelock, director, Canadian Good Roads Association, Orangeville, Ont.; Thos. T. Wilson, assist. director, Good Roads Board, Dauphin, Man.; Wm. Wright, member, Good Roads Board, Regina, Sask.; J. F. Whitson, commissioner, Northern Deevlopment Bureau, 617 Huron St., Toronto; B. Weedmark, councillor, Regina, Sask.; Wm. Waugh, councillor, East St. Paul, Bird's Hill, Man.; G. M. Williams, assoc. engineer, Bureau of Standards, Washington, D.C.; G. E Wennerlyn, adv. manager, Russell Grader Mfg. Co., Minneapolis.

The twenty-eighth annual meeting of the Society for the Promotion of Engineering Education will be held at the University of Michigan, June 29th to July 2nd, 1920.

R. A. Brown, electrical engineer, stated recently that the proposed amendments to the Electrical Act, as recommended by the Workmen's Compensation Board, would cost the city of Calgary $150,000 to put into effect.

The Canadian National Railways have ordered their new equipment for the year 1920. The new contracts call for 117 locomotives of various types, freight cars, refrigerators, cabooses and ballast cars to the number of 5,556, passenger coaches, sleepers, diners and baggage cars, 100.

It is reported on the authority of the daily press that a man sent out by the engineer of a municipality in western Ontario to scrape and paint the bridges in the county occupied much time and energy in putting three coats of black paint on a concrete bridge. Our daily contemporary observes that this will be a dark memorial for somebody.

ASPHALTIC CONCRETE PAVEMENTS*

By W. H. Connell
Consulting Engineer, Philadelphia, Pa.

NINE-TENTHS of the highway problem to my mind has always been the upkeep. The "stitch in time saves nine" maxim is really the whole problem, after the location of the road has been selected and provision made for drainage. Location comes first, and drainage comes second of course. After provision has beeen made for those two fundamentals, then the question is what kind of road is the one that should be built in this particular locality. That depends upon traffic, social and local conditions. It would be perfect nonsense and waste of money to put down asphaltic concrete, or concrete, or sheet asphalt in a location where there will not be enough traffic for that kind of pavement in a great many years. One must start at the bottom and build up gradually. First, the earth road, then the gravel road, then macadam roads, then macadam roads, surface treated. Then come penetration roads, bituminous or asphaltic concrete on a macadam foundation, and sheet asphalt on a concrete foundation then comes the concrete, then the brick and last but not least, the granite pavement.

Macadam Excellent if Given Surface Attention

I have heard a great many engineers in different localities say that the day of macadam has gone by, that macadam will not stand up under present day traffic in localities where there is considerable motor traffic. It will stand up, and almost indefinitely under automobile traffic, if given surface treatments as frequently as are required. Surface treatments should be applied to macadam roads under some conditions every year, and under other conditions every two years or three years, depending on the amount of traffic. I recently went over a number of roads in Pennsylvania where there are a great many good roads of all descriptions with a number of engineers, and they said "we have come to the conclusion that we are going to lay off these roads and let them all go, all gravel and macadam, until we can afford to put down one of the more or less permanent types of pavement." That policy will result in an unwarranted waste of money. We have proved right in New York city and some of the heaviest travelled roads in Philadelphia that one can take an ordinary broken stone road and keep it almost indefinitely at a very modest cost, if it is given constant attention. Keep the surface treatment on it. Patch the road, and give it the day-to-day attention that anything else in the world requires if it is to be kept up, and the road will give first class service, until the time when it is going to be turned over to very heavy motor truck traffic.

I resurfaced a macadam road in New York City, the Grand Boulevard and concourse, the main highway leading out from the Bronx to Boston, with from ten to twelve thousand automobiles a day travelling over it. It was built in 1910. We did not have any pressure means for putting down our surfacing material, but used the old crude method of the watering can. It was macadam surfaced with tar. That road has been kept up and treated as often as required and is in perfect condition to-day, and was when I saw it a few weeks ago. That is an illustration of what can be done with materials at hand. If you take the materials at hand in this part of the country, and follow out the principles laid down by Mr. Hirst and some of the other speakers who have dealt with the problem of handling earth and gravel roads, and you can build up a road system here that will be adequate for the traffic you have. If that road is located right, and the drainage is properly taken care of, all the money you put into the roadbed to-day is going to be returned to you a hundredfold when the time comes to lay the asphaltic

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*Address delivered at the Seventh Canadian Good Roads Convention, Winnipeg, June 1st-3rd, 1920.