Any gain, by curtailment of vertical clearance requirement, or by change of railway grade, or by both, means corresponding shortening of road approaches, at the high ends. Such a gain of 1 ft. may greatly reduce the cost of a given grade separation, making it practicable when it would not otherwise be so. A vertical gain of 2 ft. would mean a very large addition to the number of practicable grade separations.

The extreme allowance that should be made for brakemen on a car must not exceed 7 ft.; 6½ will clear any brakeman unless he should be over 6 ft. tall, and 6 ft. brakemen are not common, to say the least. What is to be said for the contention, seriously made, that the brakeman on the running board of highest known car, should be allowed room to swing his lantern over his head? The necessity for brakemen on the tops of cars is becoming less and less, and has in many cases disappeared, rules and regulations of railway companies to the contrary notwithstanding. The air brake is now universally used in train control. In Canada the orders of the Board of Railway Commissioners, in force since Dec., 1908, provide that no regular freight train shall be allowed to proceed on its journey unless at least three-quarters of the cars comprising it are equipped with air brakes in good working order; also that every freight car built shall be equipped with air brakes and with operating levers on both sides of the end.

A stage is reached in the traffic of railways when grade crossings become intolerable, and when the risk and interruption due to them becomes more expensive than their elimination. In Europe, grade crossings, in any considerable centres of population are the exception, and this may soon be said also of main trunk line railways in the older parts of the United States. The Pennsylvania Rd. makes it a rule to avoid all grade crossings on new work, and has within the last nine or ten years eliminated over 50% of all its grade crossings on main lines. To do this clearance must be made as low as possible. Overhead bridges are as low as 16½ ft. above top of rail, while many are 18½ ft. and less. Twenty-one ft., the standard for signal bridges, is recognized as the highest clearance for which there can be any need. In New York State many overhead bridges are only 18 ft. above the top of rail, and this is the case also in Massachusetts and in other states. The New York Central and H.R. Rd. has asked for 16 ft. or 16½ ft. clearance for all overhead bridges within the electric zone, extending 16 miles from the Grand Central Station, New York.

Electric traction within limits for such large centres of traffic as Montreal and Toronto, with hydro-electric energy, abundant or soon to be, is easily within the range of probability in the not distant future. Smoke abatement alone points in this direction. The vexed question of grade separation would at once assume an entirely different aspect if these conditions were accompanied by a cutting down of the vertical clearance requirements to 17 ft. or even to 18 ft.

It is submitted that with conditions as they are and more so with regard to the future, 20 ft. (13½ ft. for car and 6½ ft. for man), is a reasonable vertical clearance. It has been shown that 13½ ft. covers the height to running board of all but a very small percentage of freight cars now in use, and that cars higher than 14 ft. to running board, i.e., higher than 14½ ft. over all, or to top of brake rod, can only to a limited extent traverse beyond their home railways. That higher cars will be economical or practicable is as little probable as that the gauge of railways will be widened or their entire structure changed. For a vertical clearance requirement greater than 21 ft. (14 ft. plus 7 ft), there can, in any event, be no conceivable rational need.

In the United States there is no federal law fixing vertical clearance for bridges over railways. A number of states deal with the question. In Massachusetts there is a special Grade Crossing Commission. The minimum clearance required by this Commission is in general 18 ft. Connecticut and Rhode Island also specify 18 ft. In New York the Public Service Commission has charge of grade crossing regulations. While this Commission requires 21 ft. clearance where practicable, many lower bridges are built throughout the state, some, as already stated, are as low as 16½ ft. New Hampshire, Ohio, and Indiana require 21 ft. The only states requiring more are Illinois and Vermont, where 22 ft. is specified, but exception is made where this height is not practicable. In all other States there is no statute or regulation, as far as has been ascertained, and heights of overhead bridges vary from 16 or 18 ft. to 22 ft.

In Canada the Dominion Railway Act of 1904 specifies a minimum clearance of 22½ ft. above rail top for bridges over railways, with no deviation except by leave of the Board of Railway Commissioners; and this board has hitherto not allowed a deviation in any case.

The foregoing paper was read before the Canadian Society of Civil Engineers recently.

A General Superintendent's Opinion.

Alfred Price, General Superintendent Western Division, Canadian Pacific Ry., is well known in Eastern Canada, the scene of his earlier activities, as he is also in Western Canada, where for the last seven years he has occupied prominent positions in the company's service. He has had a most valuable all round experience as messenger, operator, car accountant, train dispatcher, car distributor, chief train dispatcher, superintendent,Superintendent of Transportation and General Superintendent. and is consequently in a position to speak with authority on railway matters. We therefore specially value the following which he favored us with a short time ago:—

Canadian Pacific Railway.
General Superintendent's Office.
Calgary, Alta., Oct. 21, 1909.

To a railroader who desires to keep in touch with current railway news and alive to the railway development of our country, I consider it essential that he read the Railway and Marine World. Its distinguishing characteristic is its reliability.

A. PRICE.

That Mr. Price's opinion of our paper is shared by railway men generally is shown by its thorough circulation among all classes of them throughout every province of the Dominion and in Newfoundland. What Mr. Price describes as "its distinguishing characteristic, its reliability," has caused it to be absolutely relied on, and as a consequence it is thoroughly read by its subscribers, and is of correspondingly value to its advertisers.

The Temiskaming and Northern Ontario Ry. Commission has decided to send engineers to make a thorough examination and test of the lignite beds discovered on the projected route of the line north from Cochrane, Ont.

May Birthdays.

Many happy returns of the day to—

W. R. Baker, Secretary and Assistant to President C.P.R., Montreal, born at York, Eng., May 25, 1852.

G. S. Cantlie, General Superintendent Car Service C.P.R., Montreal, born there May 2, 1867.

M. Donaldson, Superintendent Ottawa Division G.T.R., Ottawa, Ont., born near Edinburgh, Scotland, May 1, 1851.

G. C. Dunn, District Engineer G.T.P.R., Winnipeg, born at Quebec, May 13, 1862.

J. D. Evans, Chief Engineer Central Ontario Railway, Trenton, Ont., born at Goderich, Ont., May 27, 1843.

E. T. Galt, President Alberta Railway and Irrigation Co., Montreal, born at Sherbrooke, Que., May 24, 1850.

C. M. Hays, President G.T.R., and G.T.P.R., Montreal, born at Rock Island, Ill., May 16, 1856.

G. H. Hedge, Assistant Master Mechanic C.N.R., Winnipeg, born at Neath, Wales, May 26, 1865.

R. B. Hepburn, President and General Manager Ontario and Quebec Navigation Co., Picton, Ont., born there May 27, 1876.

W. T. Huggan, Accountant and Auditor, Prince Edward Island Railway, Charlottetown, P.E.I., born at Halifax, N.S., May 24, 1851.

W. S. Kinnear, Assistant General Manager Michigan Central Rd., and Chief Engineer Detroit River Tunnel, Detroit, Mich., born at Circleville, Ohio, May 25, 1864.

W. Marshall, Superintendent C.P.R. Telegraphs, Ontario Division, Toronto, born at Garden Island, Ont., May 18, 1859.

M. Neilson, C.E., Consulting Engineer, Montreal Street Railway, born at Almonte, Ont., May 26, 1852.

A. L. Ogilvy, General Purchasing Agent, National Transcontinental Railway Commission, Ottawa, Ont., born at Richwood, Oxford County, Ont., May 23, 1868.

Hayter Reed, Manager-in-Chief C.P.R. hotels, Montreal, born at L'Orignal, Ont., May 26, 1849.

H. B. Sherwood, Superintendent Bay of Quinte Railway, Napanee, Ont., born at Auburn, N.Y., May 25, 1847.

E. Tiffin, Member Government Railways Managing Board and General Traffic Manager I.C.R., Moncton, N.B., born at Hamilton, Ont., May 5, 1849.

J. H. Walsh, General Manager Quebec Central Railway, Sherbrooke, Que., born at Quebec, May 12, 1860.

H. K. Wicksteed, Chief Engineer of Location, Mackenzie, Mann & Co., Ltd., Toronto, born at Quebec, May 25, 1855.

James Yeo, ex-Roadmaster Intercolonial Railway, Riviere du Loup, Que., born at Bideford, Devonshire, Eng., May 1, 1830.

Railway Subsidy Lands in British Columbia.—Under an act passed last session of the British Columbia Legislature, the Government is authorized to enter into conditional agreements to acquire for the province by purchase, exchange or otherwise, any lands granted by it in aid of the construction of railways, and to pay the whole or part of the purchase price of such lands by the issue to the vendor of inscribed stock of the province, or otherwise. All lands acquired under the act shall, after their acquisition, be subject to the provisions of the Land Act. No agreement is to take effect until it has been ratified by the Legislature.

The G.T.R. started running through trains from Montreal to Manitoba, Saskatchewan and Alberta, running over the company's own lines to Chicago, Ill.; thence by U.S. connections to Winnipeg, and from there over the G.T.P.R.