

upon local capitalists and the public, this fear will be replaced by confidence, and the future of independent telephone enterprises will be assured. This emancipation is, in fact, already taking place, for there are at the present time forty independent telephone companies in Canada, chiefly in parts of the country to which the Bell have been either unable or unwilling to extend its system. One of the latest and most important enterprises of this sort is the system just put in at Port Arthur and Fort William, described in detail in this issue.

The ideal solution of the telephone problem in Canada is the nationalization of the service and the extinction of the Bell monopoly by purchase by the Dominion Government, the control of this service being placed in the hands of a commission, independent of politics and irremovable by a party. This plan is carried out in Australia in the management of the Government railways, with the most satisfactory results, and such a plan would succeed equally well in this country, if not only the telephones, but the railways and telegraphs were taken over by the State. The hope of getting any effective control of Bell rates by a parliamentary committee is utterly vain; and if public opinion is not yet ripe for nationalizing the telephone service, then the only alternative is the extension of the system of local independent companies, as in the United States.

—The glass in York Cathedral, in England, which dates from the 13th and 14th centuries, has recently given evidence of a curious "disease." Small holes have made their appearance, and it is losing its transparency. It would be interesting to learn whether this phenomenon has been observed anywhere else, and what the cause may be.

—It is rumored that Governor Odell, of New York, will recommend in his message to the State Legislature that the Lake Ontario route be adopted in preference to the Erie Canal route for a 1,000-ton barge canal from Lake Erie to the Hudson. This route will, it is stated, effect a saving of \$20,000,000 in the cost.

—Is granite a mineral? will have to be decided by the courts in a suit brought by the Northern Pacific Railway against J. A. Soderberg, of Washington State. When a land grant was given to the railway, all minerals were reserved, hence the action. Most persons would say that granite is a rock, not a mineral, but the Century Dictionary defines a mineral as any constituent of the earth's crust.

—Capt. McKay, chairman of the committee on aids to navigation, of the Lake Carriers' Association, in reply to an enquiry by F. H. Clergue, states that no experiments with acetylene gas for buoys have been made in the United States, though several schemes have been proposed. The light-house department will test any working model which promises success. As the Engineer has already stated, the Canadian Government has been experimenting, using Pintsch gas with about 20 per cent. of acetylene to increase the

brilliancy of the light. The difficulty seems to be to find a reliable burner, as they all become defective after a very short service.

—The coal production of the world for 1901 was 866,165,000 short tons, of which Great Britain produced 28 per cent., Germany, 19.2 per cent., and the United States, 34 per cent. These three nations, which have 10 per cent. of the world's population, produced 81 per cent. of the total coal mined. The output represents the labor of over 3,711,000,000 men during one year. This is more than double the population of the globe. The calculation is based on the assumption that the combustion of a pound of coal produces energy equal to the work of one horse for one hour, and that one horse is equal in power to seven men.

—During the past three or four years the demand in many branches of manufacturing has exceeded the supply. Especially is this true in the iron and steel trades. The result is the establishment of many new plants. Caution should be exercised, for when a time of depression comes, as necessarily it must, many of these plants will be idle. It is better that the demand should exceed the supply than that over-production should be unduly stimulated.

—The breakage of steamer screw shafts is one of the most puzzling of current engineering problems. These accidents are generally attributed to combined bending and torsional action. A ship not being a rigid body, wave action may produce a bending strain on the shaft, which, added to the torsional stress, due to the action of the engines, may cause a break. An increase in the diameter of the shaft might only increase the difficulty. The Engineering News speaks of another theory recently put forth, which attributes shaft failures to torsional vibrations of the shaft. This will have its effect in a heavy seaway, where the screw is alternately in and out of the water. Investigations made in Germany show that in some cases the momentary torsional force is nearly three times the average. In some cases the torsional stress is reversed, and the propellor actually drags the engine along. The torsional deflection of the shaft was found by the electric chronograph. The practical application is that to keep the vibrations within safe limits the speed of the engines must be regulated with reference to the natural period of vibration of the shaft.

—An interesting application of electrical energy, which furnishes an object-lesson to electrical companies in Canada and the British Colonies, is now developing in California, where the Northern California Power Co. now has a Westinghouse generating plant, at Cow Creek, a station situated in the high Sierras, and which is typical of the many transmission plants recently installed in that State. Besides furnishing current from this and another station for ore smelting, for operating air compressors, and for town lighting and waterworks, a large amount of current is applied to the irrigation of land. A number of towns lie along the rich valley of the Sacramento river, and