Great Northwestern Telegraph Co.

Offices have been opened at Burketon, Ont., Les Ecureuils, Que. The office at St. Scholastique, Que., has been closed.

An elevator is being installed in the Co.'s office in Montreal, where a number of handsome suites have recently been fitted up & are under lease to two or three steamship lines.

The Co. has appealed against the municipal tax on its poles in Quebec city, on the ground that the by-law imposing the tax is ultra vires, the corporation having no power to pass it. The

The proposed extension of the Northern Pacific Ry. in Manitoba, over which the G. N. W. has exclusive working arrangements, will open up for the Co. some new territory, embracing several places of considerable importance west of Portage la Prairie. The telegraph line along the Souris River. branch has been completed, & some half dozen places have been given telegraphic communication for the first time.

The wiring in the Head Office, Toronto, is being re-organized. At present all wires come in through the tower on top of the building & are brought from there through grooved boards to the switch. The change now being made is doing away entirely with the tower & grooved boards, the wires being brought in directly back of the switch where all lightning arrestors & other protectors against foreign currents will be placed.

The officials are congratulating themselves on the success of their service between Eastern Canada & Vancouver & Victoria, B.C. The time made on mining quotations between Toronto & Vancouver recently has been a feat of which they claim to be justly proud. Toronto mining quotations are being got through & delivered in Vancouver inside of 10 minutes, a service which they say it would be only possible to surpass on a direct wire between these Points, which does not exist. The business of the Company between Eastern Canada & Vancouver is said to be making rapid strides.

The Commercial Cable Co.'s report for 1898 states that the net traffic earnings from cables & land lines increased \$107,409.83 over 1897. Out of the balance to the credit of evenue account there has been set aside \$350,000 as an addition to the reserve, & also 100,000 to the fund for the insurance of stations, apparatus & repair steamer, & these sums will be invested in first-class securities. The reserve now amounts to \$3,037,103.43, & the insurance fund to \$200,000. During the year there have been issued \$2,000,000 4 Mortgage bonds. The proceeds have been partly expended in acquiring the property of the D Ist the Pacific Postal Telegraph-Cable Co., & fur-ther extensions of land lines, thereby adding to the categories of land lines of land lines of land lines of land the categories of land lines of lan the Co.'s land line system 3,449 miles of poles, 12,841 miles of wire, & 468 offices. After pro-viding for all operating expenses & reserves, the bit operating expenses including the the balance of net revenue, including the amount brought forward from 1897, amounts to e. to \$1,908,758.83, out of which have been paid interest on bonds & debenture stock \$704,-296. 48, & dividends & bonus on capital stock, \$0,48, & dividends & ponus on cupation \$800,000, leaving a balance of \$404,462.35, the present year.

to be carried forward to the present year. The Yukon Telegraph.-It is said the tele-Braph construction party sent out by the Do-Minion Government has lost no time in Setting to work on the line from Lake Ben-nett to Dawson, Yukon. At the end of April the to Dawson, Yukon. the Poles were cut down as far as White se, & the wire will very soon be strung to Cariboo Crossing. Two camps are operating, one from Bennett, & one from Cariboo Crossing, but as soon as the lake & rivers open, the construction corps will be divided into three parts, the men living on camp scowe interview. Keepscows, which will drop down the river, keepins, which will drop down the first, and a superior abreast of the work. The materials & Supplies will be delivered on scows. It is expected the line will be completed this year.

D. C. Corbin, of Spokane, Wash., D. Ross, of Greenwood, B.C., & others have a bill before the Dominion Parliament to incorporate the Northern Telegraph Co., with a capital of \$50,000 & head office at Greenwood. Power is asked to construct & operate lines in Yale & East & West Kootenay.

The Northern Commercial Telegraph Co. is applying to the Dominion Parliament for an Act amending its charter by providing that the majority of its directors need not be resident in Canada ; that branch lines built by it shall not exceed 70 miles in length ; & to increase its capital stock ; & for other purposes.

Mr. Carter, an old time Canadian operator, tells an interesting story of his work with Edison 25 years ago. The two were working at Stratford, Ont., where Edison was station telegraph operator. There was a mistake in some order, & a collision was narrowly averted. Edison, in consequence, had to face the Superintendent at the old Union Station, Toronto, who rated him roundly for his "criminal carelessness." It was more than the young genius could stand, &, quietly exclaiming that he had had enough, Edison slipped on his coat & then severed his connection with the Co. A short time ago Mr. Carter visited Edison at Jersey City, & the two laughed over the Stratford episode.—Canadian Electrical News.

A New York despatch of Apl. 26 says :-"The record for long distance practical telegraphing was broken yesterday by the Associated Press on its regular system of wires, leased from the Western Union Telegraph Co. A continuous circuit of 6,000 miles, reaching from New York city to the Pacific coast, & from Chicago to New Orleans, touching Philadelphia, Pittsburg, Cincinnati, Atlanta, Memphis, St. Louis, & Kansas City, Omaha, Denver, San Francisco & all the larger intermediate points south & west, was successfully worked for several hours. There were 41 operators copying from a sender in New York with newspapers being served directly from this one circuit in 38 of the leading cities of the U.S. Longer circuits have been worked for short periods, but as far as known yesterday's record has never been equalled considering the number of operators copying, the number of newspapers served, & the territory covered by the circuit."

TELEPHONE MATTERS.

Long Distance Transmission.

By J. H. Winfield, Eastern Superintendent N. S. Telephone Co., New Glasgow, N.S.

Long distance work is every day becoming a more important factor in the telephone business, & toll lines, instead of (as a few years ago) being regarded as mere accessories to the city exchanges, are now recognized as absolute necessities. We are talking over longer distances almost every month. A few years ago 500 miles was considered quite a feat, to-day we have conversations carried on over 1,000 miles of wire with perfect ease. In view of this it may not be amiss to speak of a few of the difficulties that are encountered in the design, construction & operation of these long lines.

The apparatus used in making a toll line connection may be divided into three parts : 1. the line ; 2. the instruments ; 3. the switching apparatus. The chief factor in extending the talking limit, has been the improvement in the line. Grounded circuits of iron wire are now practically obsolete, the recognized standard being a metallic circuit of hard drawn copper wire, generally no. 10 B. & S., weighing 170 lbs to the mile, but sometimes for short distances of no. 12, weighing about 104 lbs to the mile. The New York & Chicago line is constructed of wire, weighing 435 lbs to the mile, but that is an exceptional case.

In speaking of the line I shall confine myself to the electrical rather than the mechanical difficulties that have been met with and overcome. Our object is to so construct the line & arrange the apparatus, that the sounds at the receiving end shall possess the following characteristics: loudness or volume; clearness; quality. Of these three clearness is by far the most important, for a faint sound, if clear, is perfectly intelligible, & a change in quality may only have the effect of disguising to some extent the speaker's voice. Volume is affected by any conditions which alter the amplitude of the wave.

Clearness is affected by any conditions which alter the position of the waves in regard to each other. Quality is affected by any conditions which alter the form of the wave. Therefore, the volume is reduced by resistance, leakage, static induction, & self-induction, the effect of these properties being to reduce the amplitude of the wave.

Clearness is reduced by static induction, & self-induction, these tending to alter the interrelations of the waves; static induction causing a rounding off of the top of the wave, thereby involving a loss of sharpness, & both static induction & self-induction produce an unequal retardation of phase for vibrations of different periods, thus causing interference & a resulting deformed wave. In other words, the telephone current being an alternating current of a frequency varying from 200 to 1,500 periods a second, according to the sound produced, static induction & selfinduction produce a greater retardation on the waves of high frequency than on the lower ones, thus mixing up the waves to some extent, & rendering the speech muffled.

Quality is changed by all the properties which reduce the clearness, & by self-induction in another sense as well, this effect of self-induction being to reduce the amplitude of the overtone waves to a greater extent than of waves of a longer period.

Evidently then, in order to accomplish good telephonic transmission of speech we must make the self-induction & electro static capacity of our line & apparatus as low as possible, resistance & leakage being of less importance, though of course they should not be lost sight of. A small & well distributed leakage is often an advantage, as it allows the static charges to escape, clearing the line & to some extent neutralizing the effect of capacity, the slight loss in volume being more than counterbalanced by the gain in clearness. When iron wire is used there is a much further deformation of the waves than is caused by the increased resistance, due to the fact, the wire is circularly magnetized & this magnetism has to be reversed twice in every vibration. There is also a considerable increase in selfinduction due to the magnetic properties of the metal.

The self-induction of a copper metallic circuit of no. 10 or 12 wire is very small, but the self-induction of the apparatus which always forms part of a telephone circuit is sometimes very high & has a considerable effect on the current. Long distance lines would be particularly liable to disturbance from cross-talk if no means were taken to prevent it. There are two cases in which cross-talk will not be produced on a metallic circuit by a neighboring wire. The first is when the disturbing wire is at an equal distance from each of the wires of the metallic circuit. Were it always possible to string wires in this manner, there would be no trouble from cross-talk; but a little consideration will show that this is only possible for two circuits. The second method is known as transposing. The two wires of the metallic circuit are transposed at regular distances, or, in other words, they change places, A changing to the pin B was on & B going to the pin A was on, the effect being to