

violent internal emotion in the spheroid, and there is evidently evaporation, which rapidly reduces the size of the spheroid till the liquid, having all gone, there remains only a little heap of loose particles not adhering at all to the metallic surface of the spoon, which has not even been dimmed in the process.

WEIGHT OF ICE-LADEN TREES.

The wholesale breaking of limbs from ice-incrusted trees during a storm at Philadelphia led some persons of enquiring minds to experiment with a view to determining how much more a rain-soaked, ice-covered limb weighs than one that is dry. A resident of Overbrook hauled into his house a limb that the storm had blown from a stately tree on his lawn. When weighed the ice-covered, rain-weighted limb tipped the beam at fourteen pounds. A day or two later the same limb, dry, weighed but $1\frac{1}{2}$ pounds. More remarkable was the experiment conducted by a Chestnut Hill man. A limb from a maple tree snapped short, due to the covering of ice that weighed it down. This fragment was put on the scales and seventeen pounds was recorded. Two days later, when dry, the limb weighed precisely one pound. Taking this last experiment as a criterion the trees at Philadelphia weighed about seventeen times more in the storm than in dry weather.—Philadelphia Press.

EXAMINERS AT TORONTO UNIVERSITY.

The following have been appointed examiners at Toronto University this session: Civil engineering, W. T. Jennings, C.E.; mechanical and electrical engineering, R. A. Ross, E.E.; mining engineering, G. R. Mickle, B.A.; mineralogy, T. L. Walker, M.A., Ph.D.; geology, A. P. Coleman, M.A., Ph.D.; metallurgy and assaying, G. R. Mickle, B.A.; thermodynamics and hydraulics, R. W. Angus, B.A.Sc.; theory of construction, J. Galbraith, M.A.; properties of materials, C. H. C. Wright, B.A.Sc.; electricity and magnetism, T. R. Rosebrugh, M.A.; analytical and applied chemistry, J. W. Bain, B.A.Sc.; geodesy and astronomy, L. B. Stewart, D.T.S.

THE TELEPHONE PROBLEM.

Editor Canadian Engineer:—

We note with interest your editorial on "Telephony in Canada." You will kindly pardon us for offering our opinion with reference to this, but we wish to say that while we believe that the tendencies are toward a national or even an international system, with its policy regulated by the Government or Governments, we do not believe that the ideal solution would be for the Government to purchase present systems of the Bell companies. This would be, in our opinion, a very poor investment on almost any basis, as their systems practically all need rebuilding in their outside construction, which costs as much or more than putting in a new plant, and nearly all their systems are equipped with antiquated apparatus and need a complete new outfit. Practically all the Bell companies have is their franchises, which in fact, belong to the people, and their contracts, which in every instance can practically all be secured by a new company starting with a first-class system and in most instances be more than doubled. On the other hand, however, their property cannot be confiscated even though their profits have exceeded many times their investments.

We believe that the quickest and best solution is the policy adopted by the towns of Port Arthur and Fort William with reference to this question. These towns have confiscated no property, they have simply started a straight business transaction the same as any individual corporation would have a right to do.

We wish to also say, with reference to the statement regarding the Grand Rapids, Wisconsin, exchange, that while their original charge to subscribers may be a fair basis for a co-operative system, we do not believe, however, that they can continue to pay back the amount in dividends, as stated in the article, and operate the plant by itself, and take care of any emergency such as breaking down of the pole line in case of a sleet storm or accidents of this kind, which should

be provided for. While there have been less failures in independent telephone exchanges in the States than any other line of business, not excluding banks, the failures that have occurred are practically all traced to systems where the rates have been put upon a basis without taking into consideration depreciation or accidents. To make independent telephony a success, rates in the first place should be encouraged upon a fair and equitable basis, and, secondly, that the plants should be installed, not at the lowest possible original cost, but in the most durable and efficient manner possible.

INTERNATIONAL TELEPHONE MFG. CO.

THE FUEL PROBLEM IN CANADA.

Editor, Canadian Engineer,—

Sir,—In reading "Fuel Famine," in December, I agree with much that he suggests about sources and saving of fuel. I would like also to suggest a few sources and conditions which are peculiar to Canada.

1. Though coal is not to be expected below the carboniferous strata in any case, yet there may be an absence of the intervening strata between it and the archaic rocks so common in the greater part of Canada. Between the coal measures of the Ohio Valley and the granite vertebra of North America is a long distance; but on the northern slope towards James' Bay, the series is more closely grouped, and coal may be expected in the great clay belt recently explored by the Ontario Government, or even farther south. I received a piece of cannel coal from a hunter, who picked it up near the head of Moose Waters and about 70 miles north of the C.P.R. It was submitted to Major Hamilton Merritt, who declared it genuine coal, save one crystal of iron pyrites, which had induced the hunter to pick it up.

2. The occurrence of red sandstone is considered a good indication of coal in British Columbia, and I am informed that in places it lies in contact with the granite and good coal in the immediate vicinity. Exposures of the same rock are to be found in the Moose Waters, in the district from which my specimen of coal was obtained. A careful exploration of the district would probably result in finding both coal and gold, in conditions similar to those of East Kootenay.

3. But while nature works slowly in forming coal beds, and even peat bogs, she supplies carbon, in unlimited quantity, more rapidly in our forests, and even prairies. Enough of carbonaceous material is left to waste and endanger the remaining forest, every year, by our lumbermen, to supply fuel to all the cities and towns of Canada. The stumps and tops of pine are rich in turpentine and by-products of distillation; the charcoal left could be ground and compressed for fuel, both domestic and mechanical—relieving the strain upon the coal mines, and removing a dangerous nuisance from our back country. It would also be a benefit to our new settlers, who have to clean up the waste left by lumbering before they can raise crops for themselves. The terrible fires that have devastated Michigan and Northern Ontario are the direct outcome of allowing men to remove about 40 per cent. of the pine tree, while the other 60 per cent., together with other trees cut down in getting it out, are left to devastate the land in after years.

A system of forestry, which would preserve pine lands to be cut when ripe, use up the remaining portions of the tree, and cultivate the intervening arable land, while supplying fuel as well as lumber to older lands and cities, is the only logical solution of the problem. Export less lumber and produce more fuel, while having a great export of products of destructive distillation, will be better for the nation, and immeasurably better for future generations of Canadians. Economy of our latent wealth, domestic comfort, and steadily increasing resources, ought to be the watchword of every thinking citizen. Our water power would be conserved, and our agriculture improved by prudent utilization of our forests, instead of vanishing entirely, as in many portions of the United States.

On page 322 you remark the advantage of finely pulver-