however, the tendency is to load the capital and let the working cost down too lightly.

A company with keen competition and limited rights is situated very differently from a company with a monopoly and limited rights. Both of these must charge a price sufficient to cover all losses and also sufficient to provide profits with which to pay lucrative dividends. Again, a municipality with a monopoly and an unlimited franchise is situated so favorably that its costs of transport should be unapproached by any other system, being free from competition and the necessity of making profits. But under any system the price of the ticket should be sufficient to create an ample reserve for renewals, as this undoubtedly is required to provide for one of the losses which should be covered in the price paid for the fare, being the extent to which depreciation is estimated to have occurred.

Depreciation.—The subject is very wide because different classes of assets depreciate at different rates, but as a matter of principle when capital is spent in the purchase of machinery, plant, land or buildings with a view to a profit being earned, provision must be made for the replacement of the capital before the return can be regarded as profit.

In determining the rate of depreciation the main facts to be kept in view in reference to a particular subject are:

First—The original cost.

Second—The annual repairs required.

Third—The probable life.

Fourth—The market value.

Fifth—The break-up or residual value.

In allowing for depreciation the rate may be calculated on the original value or upon the diminishing value from which the depreciation of previous years has already been written off.

Where the depreciation allowed is on the original cost a much lower rate is sufficient than where the depreciation is calculated on the diminishing value. The usual method is to calculate depreciation on the diminishing values, the effect being that in later years the charges for depreciation are lighter; but this, as a rule, is counterbalanced by the increasing cost of repairs as the assets get older. As an example, if the life of a machine be taken at twelve years with a residual value of 10 per cent. of the prime cost, then depreciation would need to be written off at 7½ per cent. per annum each year. To arrive at the same result, if the percentage is written off the decreasing value each year, it will be necessary to write off at the rate of 17.46 per cent. per annum on the decreasing value; and again in providing a reserve for renewals to be invested at compound interest at current rates pending the amortization of the plant, a still lower percentage may be taken, shown as follows: £100 in twelve years on diminishing values, with a residual value of £10, equals 17.46 per cent. per annum; £100 in twelve years on original cost, with a residual value of £10, equals 7.50 per cent. per annum; £100 in twelve years invested at 3½ per cent. interest, with a residual value of £10, requires a reserve of 6.16 per cent. per annum.

The latter system of providing and investing the reserve is preferable, as the annual charge is regular and lower from the commencement, and there is provision available to carry out the renewals as they become necessary.

Reserve for Renewals and Sinking Fund.—The reserve for renewals should stand distinctly upon its own foundation and not be associated with the requirements of a sinking fund which may exist for distinctly different purposes.

The object of the reserve for renewals is to replace worn-out capital. The object of the sinking fund is to accumulate capital for the purpose of paying back borrowed capital.

The reserve for renewals and the sinking fund may be subject to the same natural law.

In determining the reserve for renewals we take into consideration the amortization of the plant and provide for its continuance, or, in other words, we keep up the value of the capital, either in plant or investments, and base its upkeep on its life.

In determining the sinking fund, should we not also consider the amortization of the community, which is responsible for paying off the loan, or whether the community may be considered at all to amortize? In the former case the machinery and plant will, we know, be entirely renewed in a given number of years, and the community using that machinery and plant will be obliged morally and economically to pay the cost; but having done that, the community, as a community, continues as juvenescent during the period of the depreciation and renewal of the whole undertaking. Also, as a sinking fund is the accumulated wealth of a continuing community, the question is, how far will the present generation participate in the advantages of the sinking fund? and just to this extent should they contribute toward it in the price they pay for their tram fare. It is not a simple proposition that if the life of a generation is forty years one-fortieth should be paid off yearly; but the proposition is this—provided that obsolescence is not contemplated, at what rate should a continuing, ever-juvenescent and increasing community accumulate capital in the form of a sinking fund, or is there any moral obligation or economic reason why it should create a sinking fund at all? In forty years, in all probability, owing to the increased population, the debt per head will have been reduced 50 per cent., and with increased land values I consider it quite unnecessary to bestow upon the next generation a system fully equipped and free of cost.

WATERPROOFING CONCRETE.

A method of treating concrete proposed in a report submitted to the National Association of Cement Users, is the following. On flat surfaces lay a base of concrete at least 2 inches thick, and plaster while still wet with ⅛ inch of neat cement, trowelled hard; follow with another layer of finishing concrete not less than 3 inches thick. On wall surfaces, as soon as the timbering has been removed, thoroughly wet the surface, trowel on ⅛ inch of neat cement, and follow with a 1 inch coat of 1 : 2 cement mortar before the neat cement has begun to set appreciably. If the surfaces treated in either way are of large areas, the materials applied should be reinforced to obviate cracking.

TESTS FOR INSULATED WIRE.

A revised set of regulations issued by the Electrical Department of New York City provide that the insulation shall be of rubber or other homogeneous compound which has been approved, and specify a definite thickness for each size of wire. As a protection against too soft an insulation, the rules stipulate certain tests, among which is the following: The braiding is carefully removed from a portion of the sample, and the copper wire is connected with one terminal of an electric circuit, of which a testing tool forms the other terminal. The portion of the sample from which the braiding has been removed is placed on a flat surface, and the tool edge, which is placed across the sample, is pressed down on to the insulating cover with a pressure of 5 lbs. which is maintained for about a quarter of an hour. The electric current, which must be at least 100 volts alternating, is then turned on, and the tool edge must not sink far enough through the insulation to touch the copper wire and complete the electric circuit.