proximation to indicate that the cost of railroad capital is showing an upward tendency. If one were to include with the bond listings the short-term note issues, which at 5 per cent and 6 per cent have in the last few years increased rapidly in use, the rising tendency would be still more apparent. It is important also to note that in 1905 $245,961,000 or about 45 per cent of the bond listings were for new capital and the remainder for refunding, but that the amount devoted to the former use reached as low a point as $78,624,000 or 24 per cent in 1915. These figures prove nothing numerically so far as electric railways are concerned, but they do indicate what is as true for these carriers as for steam railroads—that rising capital cost under stationary rates and unrestricted expense burdens is not the proper prescription for transportation development. If the public has so increased the transportation hazard that a further gradual rise in capital cost is inexorable, then it must assume the burden or forego the needed development.

FREIGHT AND COST OF LIVING

An undertaking of more than usual interest in connection with the ever-present problem of reducing the cost of living is being projected in Los Angeles. This is the erection of a new large market for the sale of foodstuffs and other farm products which will be brought directly to the market by the cars of the interurban electric railway system which centers in Los Angeles. In fact, the market is to be erected on land now belonging, in part, to the Pacific Electric Railway, although that company has no direct financial interest in the proposed undertaking.

For years a number of interurban lines, particularly in the central states, have been of great service to the farmers as carriers of their products directly to the cities, and the milk car has been a part of the equipment of a number of roads. We believe, however, that it was Prof. Clyde L. King of the University of Pennsylvania who first showed the importance of a system of cheap electric transportation directly from the farmer to the markets of a city, and the effect which such a system would have upon the cost of living, in a report made in 1913 to Mayor Blankenburg of Philadelphia. Professor King made a very careful analysis of the subject and found that if some system of direct transportation from the produce farms to the markets could be arranged it would obviate three very serious factors in the cost of retailing fresh vegetables and other foodstuffs. The first was the transportation from the farm to the steam railroad freight station. The second was the delay on the steam railroad in taking the foodstuffs to the freight station in the large city. The third was the cost of delivery from the freight station to the market. His proposed remedy was, in brief, direct routeing from the farm to the market.

This is what the Los Angeles installation proposes. In other words, it is the first step, certainly on a large scale, to meet the economic question of reducing the cost of living in large cities by introducing the most economical method of bringing the farmer and the consumer together. If the experiment in Los Angeles proves successful, a larger field of usefulness for the electric roads should be opened up by this method.

SALVAGE VALUES IN ELECTRIFICATION

In discussions of the commercial possibilities of steam railroad electrification the question of salvage value obtained from the released steam locomotives has rarely received very serious attention. This has, perhaps, been due to the fact that, until the present time, there has been little definite information upon which to base conclusions, with the result that estimates have ranged between wide limits. In general, they have erred on the side of conservatism and apparently in most cases have been lower than necessary.

The recent completion of the Norfolk & Western electrification, however, has given at least a definite basis upon which to consider the matter. In this case the electrified zone is practically a separate division of the main line. Prior to electrification a definite number of steam locomotives of a single type were assigned to do the work of the division, and when electric operation began these machines, thirty-four in number, were replaced by twelve electric locomotives. The substitution was complete, and except for the effect of a steadily rising tonnage, the twelve electric engines are now doing exactly the same work that was done by the thirty-four steam machines.

The standard type of steam engine that was displaced in this case weighed about 540,000 lb., including the tender, and the new value, which may be set at about 7½ cents per pound, would thus be $40,500 for each machine. The thirty-four engines displaced by electricity would then be worth $1,375,000 or some 45 per cent of the announced cost of the whole electrification.

On the Chicago, Milwaukee & St. Paul electrification now under construction, forty-two electric locomotives will replace approximately eighty steam engines. The variations in traffic and the shifting of motive power prevent a direct estimate of the salvage value of the latter, but an approximation based upon probable averages would indicate that this should be about 20 per cent of the total investment. Manifestly, this figure is smaller than that obtaining on the Norfolk & Western electrification because of the much lower density of traffic on the transcontinental road. In fact, the figure 20 per cent seems to represent about the minimum that might be expected under any conditions, because the St. Paul has unquestionably a lighter tonnage than any of the lines that have thus far been electrified. This road, it is true, passes over three mountain ranges within the limits of the 440-mile electric zone, and to the extent that these grades require pusher service, the number of steam locomotives needed to handle the traffic would be increased over normal conditions. However, the grades constitute one of the major reasons for introducing electric operation and on this account their influence in increasing the number of steam locomotives may be largely discounted. On the other hand, the Norfolk & Western's salvage value of 45 per cent represents presumably the maximum attainable figure.

The grades are very heavy and comprise a large percentage of the electrified line, three steam engines being used on each train prior to the advent of the electric locomotives. In addition the traffic, amounting to twenty-six east-bound trains daily, is exceptionally heavy, and these features in turn tend to offset the fact that the total cost of the installation included expenditures for a power station.

It appears, therefore, that the average salvage value of steam locomotives involved in a main-line electrification should be between 20 per cent and 45 per cent of the total cost of the installation, these figures being based on new value. In consequence, the item constitutes an important consideration in connection with calculations of possible economies due to electrification. A reduction of one-third of the investment, which is the equivalent of a salvage of 33 1/3 per cent, might well be sufficient to make an otherwise apparently unprofitabl installation into a very attractive proposition, and it would seem that more attention ought to be paid to this feature in connection with every preliminary calculation of electrification economics.

REGULATION MUST BE IMPARTIAL

Too much criticism of public service commissions by the public comes from the idea that the chief purpose of the commissions is to reduce rates. A case in point is the attack on L. D. Brandeis before the Senate judicial sub-committee because he, as counsel for the Interstate Commerce Commission in the 5 per cent rate case, dared to forget the "public" character of this body so far as to state that to his mind the carriers had proved their need of increased net income. We are not concerned here with the fitness of Mr. Brandeis for high judicial office, but we are interested in the assumption of certain public advocates that since the public did not favor certain rate increases, the counsel for the commission was, by virtue of this fact alone, derelict in his duty in giving an impartial ear to proof submitted by the railroads.

We had hoped that such evidences of mental bias on the question of corporate regulation were a thing of the past. In the early days of regulation, to be sure, utilities generally feared that the powers conferred upon regulatory bodies would be used primarily for the imposition of greater burdens on utilities simply in answer to public demands, and, indeed, we have often suspected that many citizens loudly supported the regulation propaganda because they had a sneaking idea that the natural result would be reduced rates and increased service. With the growth of the regulatory system and its more nearly perfected operation, however, a truer conception of the functions of commissions has generally risen, for it has been clearly realized that such bodies are not *ex parte* public tribunals sitting in judgment over utilities, but are impartial bodies pledged to restrain exorbitant and unjust public demands as much as to put wayward and recalcitrant corporations aright. While capable of a wider interpretation of their empowering acts than courts are of general statutes and constitutional provisions, commissions are real judicial tribunals which must hold the scales of justice as level as do the courts.

The misconception of the regulatory theory that has seemed to underly the stated objection to Mr. Brandeis may not be widespread, but it is unfortunate that it should exist at all. We are glad to observe that the new commissioners in New York City, as evidenced by their recent comments in one case to the effect that the question is not how many people would like to have increased transfers but whether it would be reasonable to impose an order on the company, have the true conception of the way in which their functions should be exercised. To strengthen our point, however, we will go far away from the scene of the turmoil in New York and cite the case of the Manitoba Public Utilities Commission, whose point of view in this matter is all the more interesting because it is not presented in any particular case but is laid down in the latest annual report as a warning because of repeated public offences.

Complaints made to this commission, it is said, fall under two heads, the first covering trouble caused by the acts or neglect of individual employees. In such cases, the commission states, the public is too likely to judge a whole system by isolated acts of a small percentage of men under standard, who, even with great care in selection, will always be found where a large number are employed. Anyone who would judge fairly the operations of a utility, and more especially electric railway and telephone systems, must remember this human element. On these systems as a whole such weaknesses are no more than existing in other labor-employing undertakings, and are probably considerably less. The other class of complaints concerns demands for improvements and increased service. In the commission's opinion, such demands are often made thoughtlessly and without regard to financial possibilities or the likelihood of operating loss. There is a want of appreciation of the fact that in sparse communities reduction of rates retards new construction and service improvement, and takes away the financial basis of a commission order for such betterments. Furthermore, the commission finds that there is a tendency to look at the rate of dividend paid by electric railways and draw conclusions superficially, it being forgotten that to regulate a utility so severely as to restrict its productiveness to the current commercial rate of interest is to stifle the enterprise.

The foregoing notes from the commission's report ably prove that judicial calmness and impartiality are not at all incompatible with the exercise of the regulatory power, but to sum the matter up we shall simply quote the commission's conclusion: "These various considerations are frequently forgotten or deliberately overlooked by persons, sometimes in fact by elected representatives, who unwarrantably create discontent against what, in view of the rates and street facilities, is reasonable public service. A commission is bound to meet and deal with all these matters with a due regard to public service, but at the same time to withstand attempts to suppress a utility through the medium of the commission." Truly a Solomon sat in judgment here!