

vantage. The Commission should not only put a stop to this unjust practice of discrimination, but should compel railroads to base the freight rates upon the cost of transportation, and not as at present upon what it will bear.

The present rate charged for passenger traffic should also be reorganized and a maximum rate of two cents per mile for first-class passengers substituted for the present three cent arrangement. As we have several times before pointed out, the present passenger rate is a most exorbitant one, and its reduction is a necessity of the near future, and we are strongly of the opinion that not only the public but the railways themselves will be benefitted by the change.

Public opinion is now beginning to be aroused upon this subject, and it is only a question of time when the principles underlying the creation of a Railway Commission will be carried into effect.

In England where such a body has been practically tried, it has been found to work so satisfactorily that the people seem to favor larger powers being granted the Commission than they formerly possessed. The abuses they were called on to reform (so like what we are at present laboring under) were so great that last year a Parliamentary Commission was appointed to investigate the complaints against the Railway Companies.

From the report of the committee, summarized by the *London Times*, which we give below, it will be readily seen that railway monopolists are the same all the world over, and that it is only by a determined effort on the part of the public that their rights will be respected by these powerful corporations. The summary of the report is as follows:—

1. That railway companies charge the public higher rates for the carriage of goods upon their railways than they are authorized to charge.

2. That the classification of goods in railway Acts is misleading and ridiculous, and that as a consequence traders are, as a fact, improperly charged when you compare one trade with another; and that they have the greatest difficulty in discovering in any case whether they are properly charged or not.

3. That certain places and districts are preferred in the matter of rates, or "nursed" by railway companies to the prejudice of other places or districts not so favored.

4. That the rates charged by railway companies for goods to be exported from, or which have been imported into this country are lower than the rates for sim-

ilar goods passing over the same railways from and to home markets, and that the home producer is seriously prejudiced by this action on the part of railway companies.

5. That railway companies do not give traders and towns the advantage of their geographical position, but by lowering the rates for persons and places less favorably situated relatively to the market they introduce a competition which, but for such low rates, would not exist.

6. That railway companies do not regulate their charges by a consideration of the cost of carriage of the goods, but by considerations of what the traffic "will bear," and that, consequently, they charge one trader high rates, that they may charge another low, and so carry the trade of the latter at the expense of the former.

7. That the means of remedying these and other grievances is not efficient. The traders dare not seek legal remedies against railway companies, and that, consequently it would be expedient to give Associations of Traders and Chambers of Commerce a *locus standi* before the Railway Commissioners.

THE REMEDIES

for these grievances the Commissioners cannot settle upon without further consideration and further testimony. But they have arrived at the following definite conclusion in their report:— They consider it necessary permanently to maintain some special tribunal to which shall be referred questions arising as to the rights and duties of railway companies in their relations to trade and traffic; and security shall be taken that the procedure of such tribunal shall be simple, cheap and expeditious. This tribunal shall have jurisdiction to enforce the provision of the special Acts of the several railway companies, and should be empowered to give redress in any case of alleged illegal charges. A *locus standi* before it should be given to Chambers of Commerce and Agriculture, and similar associations of traders and agriculturists. A revised classification of goods and merchandise ought to be adopted by the railway companies as between themselves and the public, such as under the name of the Clearing House Classification, is already in use as between themselves. Railway companies should be bound to make no increase in any rate or rates without giving at least one month's public notice in the locality. This is about all. The permanent special tribunal seems to incorporate the American idea of State Boards, though much larger powers are conferred upon them. It is needless to dwell upon the probable working of such a measure, however, seeing that as yet it is a simple recommendation from a parliamentary body which seems to be, if not helplessly floundering in deep water, at least sorely puzzled to know just how to find its way out.

Selected Matter.

THE COMPENSATION PENDULUM.

The compensation pendulum is to the astronomical clock exactly what the compensation balance is to the chronometer, and whatever facilitates the narrowing of the margin borders the central line of absolute accuracy, reduces the space demanded by final adjustment. It may never become possible to produce, by mechanical means, either a balance or a pendulum absolutely correct, and requiring no further adjustment. There are means of closely approximating to that condition, and these I propose to impart.

In the first place, the conditions of the manufacture of Graham's mercurial pendulum, the adopted both of the art and of the astronomer, require careful consideration. The rod and the stirrup should, after all mechanical work is completed, be annealed down to the simplest softness, and all subsequent bending avoided, as well as any large amount of friction for the sake of polish; and no part of the stirrup should be left on a train, but should fit without shake, but still without bind. Here we arrive at the point where the closest approximation to the proportion nearest mechanically achievable—perfect compensation for temperature. The ordinary glass jar and mercury, being the simplest, is amongst, if not absolutely, the best; and the result of a great number of experiments has proved that a glass jar of exactly two inches internal diameter, containing eleven pounds eight ounces (avoirdupois) of mercury, will be so near to absolute compensation as seldom to require any correction when tested in heat and cold. The mercury should be carefully relieved from all admixture of atmospheric air, and this is by no means an easy task. In addition to the careful removing of any visible air-bubbles, time and the application of heat should be given, in order to facilitate the decomposition of such remaining portions of air as cling with great tenacity to mercury that has been recently shaken. For this purpose a piece of bladder neatly tied over the top of the jar will enable the maker to aid this decomposition by keeping the jar for a week or so in a temperature of (say) from a hundred to a hundred and five, and the jar should not be put into the stirrup until the manipu-