

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

Volume 57

New York, Saturday, January 1, 1921

Number 1

Happy New Year! Have Faith in Your Industry!

IT IS with very best wishes for the New Year that the ELECTRIC RAILWAY JOURNAL sends forth this first issue of 1921 dated Jan. 1, which will not happen again for six years, or in 1927. We wish a Happy New Year to the various companies and men associated with the companies and we see every reason to believe that the year will turn out to be a prosperous one. There is an undercurrent of optimism which cannot be mistaken. The railways are on the up grade and going strong.

In saying what we have we do not overlook the difficulties ahead, the problems to be solved. But difficulties and problems are always with us. Life would be monotonous if they were absent. It is merely that they are different ones in 1921 from those which have gone before and been long since overcome or solved successfully. We comment later on some specific present-day conditions. What we would emphasize here is that if there is one who is discouraged on account of present troubles as he sees them, if there is one in the railway industry who has lost faith in its future, let him give place to one whose faith and enthusiasm will allow him to conquer the problems which confront him. Optimism, ability and hard work will accomplish wonders. The electric railway industry is the industry which the men in it make it. If it is successful, they are to be thanked; if it suffers reverses, introspection is at least necessary to see if they are not responsible.

As we have said before, we have faith in the men of the industry. To those who doubt we would say:

Have faith in the industry—or get out!

Happy New Year!

Tendencies in Fares and Fare Collections

WE HOPE that during the coming year progress will be made in determining the best basis for fares and methods for their collection. The trend during the past year has undoubtedly been toward an increased flat fare, but the satisfaction given by the zone system where it has been tried, on about ten properties, shows that it also has claims for consideration. The most serious objection to its use remains in finding a convenient method of collecting the fare so as to prevent over-riding. Where with a flat fare tickets are sold at a reduced rate, the tendency is very clearly toward the use of metal tokens, and in all cases the fare box, either locked or registering, is growing in popularity.

In spite of reductions in the price of food and some other commodities, the time has not yet come when electric railway fares can be reduced. Labor and coal, the largest items in the operating expense account, are still as high as ever. Moreover, a great deal of rehabilitation will have to be done if the properties are to give the service which the people want, and they can be rehabilitated only if their credit is re-established by

reasonable net earnings. Nevertheless, the time will come, if the country gets permanently on a less expensive scale of living, when fares will become less. Right here is a suggestion for the city where service at cost is being considered. In those cities which are on a service-at-cost basis this change will come about automatically and promptly without the necessity of extended hearings or any further readjustment of franchise relations, whereas this may not be the case in those localities where the company is permitted by franchise to charge a specified rate.

The experience of the past few years, hard as it has been, has had at least certain advantages to the railways. Not the least of these has been a general realization of factors in operating expenses which previously had been overlooked in many cases. This knowledge will be of value in any readjustment of fare necessary during the coming years. Railway companies now know that in order to keep their property intact they must consistently set aside from their earnings from 3½ to 4 per cent of the value of their renewable property each year as depreciation reserve. The lesson, though a dear one, may be worth all that it has cost.

Conduct Your Business as If You Had a Competitor

WE HOPE to see during the next twelve months more effort made toward merchandising transportation than ever before. Electric railway companies can no longer think that they can develop the maximum traffic possible on their lines simply by running cars. Necessity riding will come, it is true, without being sought, but this class of riding is small compared with that possible if a vigorous effort is made to obtain more.

The means for merchandising transportation are multifarious. They include many things which a large number of electric railway companies have already done and are doing every day, such as providing attractive cars, having them promptly at the points where they are needed, operating them at the speeds and over the routes desired by the majority of patrons, etc.; in other words, giving good service. Such a policy will win many passengers, just as the sale of reliable goods in a store will win many customers to the owner of that store, but few merchants would be satisfied with this as the sole inducement to attract buyers. Wide-awake merchants feel that they are not good salesmen if they do not strive continuously to impress upon the public the good quality and reasonableness in price of the goods they have for sale as well as the high grade of service to customers which they aim to provide.

Much of this effort on the part of the merchant undoubtedly comes because he realizes that he has competition in his business, and much of the lack of corresponding effort by the average railway man arises from the belief that he has no competition. This is the reason for the injunction at the head of these remarks,

i.e., "Conduct Your Business as If You Had a Competitor." Actually, of course, as the committee on merchandising transportation pointed out in its report at the last Atlantic City convention, every electric railway has competition of a very active kind. This comes not only from the public and private automobiles but, more important in most cases than either, from the sidewalk. The railway company must do as a merchant would do when he sees business which he wants going to a competitor. He studies the inducements offered by the competitor, the automobile or the sidewalk, and how many persons are patronizing them and how the company can best meet this competition with the service which it supplies.

This is what we hope the electric railway companies will do in increasing ratio during the coming year. We hope that each large company, and as many small companies as can do so, will add to its organization a "sales manager," whose chief duty will be to increase the sales of the company by every legitimate means. We expect to say more about the need of such an official in succeeding issues of this paper, but mention the point now because we consider it an important one. Such an official, as we visualize his duties, would have little to do with the details of the direct operation of the lines. His principal job would be to increase sales, though this would of course include advising the superintendent of transportation of the changes needed to make the service more popular.

Engineers Getting Together and Pushing Conservation

NEVER since engineering attained large proportions have engineers pulled together as they have during the past year or two. Undoubtedly the war helped to bring this about, but it is also the outcome of united effort, begun well before the war, to bring the engineer out of his shell and make him an influence in civic affairs. The engineers are numerous enough and well enough trained to warrant them in exerting a potent influence in the affairs of the country. They are beginning to realize this, and during 1920 they effected a federation of their national societies so that they can function as a unit when such functioning is desirable.

The engineers are getting together in other ways also. They are breaking down the barriers which have separated them into distinctive groups of civil, mechanical, railroad, marine and a hundred other types of engineers and are holding joint meetings for the discussion of topics of joint or general interest. This is noticeable in the gatherings of the sections of the national associations, which seemingly in most cases are now joint meetings. This is in the direction of economy of time and the promotion of fraternal feeling.

A large part of the thought of engineers is now being given to conservation. As a people we are extremely wasteful of our resources. We have so much that we have little incentive to save. There is only one factor that we, speaking for our country as a whole, understand, namely, high prices. When prices are high conservation is favored. Engineers are different from the rank and file of the people, however, for their profession is founded upon economy. An engineer is simply a person who builds or operates something more economically than other people. But the voice of the engineer has not been heard in the land nor in the Halls of Congress. It has been confined to his own circle, consisting of those

who essentially agree with him. He has produced wonderful results in his special line and has laid the foundation for the prosperity of the country. And the country knows it. But as for influencing general conservation, that is another story.

It would not be fair to the engineering and scientific bureaus of the government, such as the Bureau of Mines, the Geological Survey and the Bureau of Standards, as well as the Departments of Commerce and the Interior, to give the impression that their efforts at conservation are not appreciated. This is far from the case. They are doing a great work. A remarkable example is the super-power survey now being made for the Department of the Interior by W. S. Murray. Here is an instance in which the power resources of the country's most congested industrial district are being comprehensively studied with a view to giving it a more economical and reliable supply of power. This is one of the achievements of 1920. The data for the report are now practically complete and the report will be ready within a few months. This super-power survey has enough of the spectacular in it to attract general attention, and at the same time it appears to be meeting with the approval of many of the power interests. Let us hope that the survey work will be fruitful in bringing about a saner use of our power resources.

This idea of conservation is behind a considerable number of engineering developments of large or small scope. It has given an impetus, for example, to the interest in using pulverized fuel in power plants. There has accumulated a vast store of fuel waste which was considered economically unreclaimable. In powdered form it now becomes available in competition with bituminous coal at present prices. Aside from the use of waste fuels, there is much interest in the pulverized firing of coal in competition with stokers. The whole matter was considered important enough by the American Electric Railway Engineering Association to cause it to be made the basis of a special report at the 1920 convention, and it will undoubtedly come up for discussion again from time to time.

In the line of conservation also, but conservation of labor and line material rather than fuel, is the automatic substation. This has made steady progress during the past year and the outlook for 1921 is promising. In fact, as finances permit, a general switching over to automatic control seems inevitable. There are still many technical problems in this field to be solved, but wonderful progress has been made.

One of the biggest fields for the engineer in the conservation movement is in heavy traction. On account of the unsettled state of our railroads during and since the war they have not been able to give the subject much attention, but they must do so soon. In the meantime Europe and other foreign sections are going ahead, impelled by the critical fuel situation and the prevalence of water power in many parts. The situation abroad is covered rather fully in an article elsewhere in this issue.

Finally, we must not forget the slogan "Do it mechanically." In spite of the excellent progress made in the development of tools for indoor and outdoor work, much more can be done. As R. C. Cram says in his review of the track situation in this issue, there are certain operations in that field that have resisted effort to substitute machinery for hand labor. The same is true in other departments. There is need for good engineering at this point.

A Financial Program for 1921

THE electric railway industry today, backed by the reports of the Federal Electric Railways Commission and of the public utilities committee of the Chamber of Commerce of the United States as being an essential industry, still finds itself with financial problems of no mean magnitude ahead. It is reassuring, however, to see, in the face of the great industrial depression of the past few weeks, the continued usefulness of the railways, as evidenced by the traffic, and also the apparent success which the industry as a whole has eventually had in gaining fares which are at least commensurate with the cost of rendering service. But the test of the success will probably come in 1921, for there is now to be considered more than the immediate problem of merely paying the cost of service, which has been the chief trouble in the past four or five years. We refer by this to the problems of really stabilizing the finances of the industry, of refinancing many railway security issues and of taking care of deficiencies in earnings and in maintenance and, in many cases, of actual depletion of property which have occurred during this period, as is so well analyzed by L. S. Storrs in this issue.

"Restoration of credit" is a phrase worn almost threadbare in the railway industry today. "Educate the Public" is in the same category, though we certainly urge no cessation of effort in response to either of these sayings. But we must examine what the industry, as an industry, can do; what can railway managements and directorates do?

We suggest a careful study of that part of the interview with President Gadsden, printed in this issue, in which he recommends a financial program for the industry. There are many men in the industry who agree with his recommendations as to simplification of financial structures, and we see every reason to support these suggestions. We refer to a recasting of the financial structure so that the total amount of capital securities issued, expressed in terms of par value, equals the value of the property. It must be realized, as some in financial circles and in positions to have an influence in formulating the policies of the companies have not yet fully realized, that the electric railway is a public utility, regulated by the public, and that therefore the financial structures necessary and desirable in the early days of the industry, and probably still necessary and desirable in private and unregulated competitive business, may not now be the best to have in this industry.

A reference to the statistics on receiverships and foreclosures which are given elsewhere in this issue will show two things, as pointed out in the introductory remarks preceding the tables: First, that there have been fewer receiverships in 1920 than might have been expected in the race to overtake expenses with income, and that the total money involved is relatively small; and, second, that most of the receiverships which have ended in 1920 have ended through more or less drastic financial reorganizations or else through complete abandonment or junking of the property. It is both pertinent and wise to consider at this time, too, that there are several companies not in receivers' hands and not under foreclosure which are, however, in default of some payments of fixed charges which are more or less serious. This list has its encouraging feature in the indication that security holders see conditions growing better and prefer to let the companies regain their stability without outside interference, and we believe this to be a legitimate attitude. But the situation as a whole today,

while showing every indication of returning to a healthy condition, is thus shown to be one with its dangers. The year 1921, some have said, is crucial.

What is needed to meet unprecedented conditions are unprecedented methods, methods certainly which are based on fundamental economics, and also which recognize the human factor, the psychology and knowledge of the public served. The power lies with the directors of the various companies. The managements, who are closer to public opinion and whose whole energy, attention and devotion are centered in the individual properties, in contrast to the average director, who is interested in many properties and is forced to look chiefly at the financial statement for his knowledge of any individual property, must have the courage to bring constructive measures to the attention of their boards.

We are glad that "Electric Railway Financing" is to be the topic at the mid-year conference of the association. It is to be hoped that, as a result of the discussion at Chicago, definite measures will be outlined for railway men themselves to do toward restoration of electric railway credit.

Constructive Legislation Should Be a Feature of 1921

IT IS with more interest than usual that we approach the legislative season of 1921, when some forty Legislatures out of the forty-eight will be in session and when also the National Congress is busy with a legislative program that is all but staggering. From the standpoint of public utilities, and especially from the standpoint of electric railways, more intelligent legislation than ever before should be expected.

Past years have seen too much of popularly encouraged anti-utility or utility-restrictive legislation. They have also seen too many legitimate and constructive pieces of legislation affecting utilities fail to gain public approval, being passed without a general education of the public, although with full and open discussion in the legislative chambers. This year the people have before them the results of two complete and unbiased investigations of the electric railway industry. No industry has ever before been subjected to such analytical scrutiny or had the opportunity to benefit from the results thereof. It is, therefore, with a feeling that the public and the legislators are both better informed than heretofore that the legislative season is approached with optimism. If the public is not so familiar with some facts as we would wish we have largely ourselves to blame.

Another aspect of this situation is that in many states constructive utility legislation is an avowed purpose of incoming administrations and of reconvening legislatures. Unfortunately this is not universally true; in some states the utilities are still the football of politics. But, by and large, there is a desire to remove such restrictions and make such advances in legislative enactment as may be necessary to encourage utility development to meet the needs of the communities.

There will doubtless be some attention paid to the laws governing public utility commissions. Some of these have come under legislative fire for the first time because they have been courageous enough to do their duty in the face of shortsighted public opinion and demagogic political pressure. It is to be sincerely hoped that any and all legislation in this line will be of a nature to strengthen the commissions and to raise them to a position where they can more than ever command public esteem and confidence.

Electric railway men have their own work to do in this legislative program. Better than any others they know what is required and what is good or bad. Is it not the more bold and courageous thing to do to assist openly in formulating constructive legislation which will react in the development of better public service and at the same time better public confidence?

Labor and Wages During 1921

WITH the cost of living promising to be less during the coming twelve months and with unemployment in other industries increasing, the wage question for electric railways must be fairly met during 1921. According to statistics compiled by Professor Richey from a number of street railways there has been an average increase of 25 per cent during the year which has passed in the hourly street railway wages paid in the section east of the Mississippi River. Based on an index figure of 100 for 1913, the figure in December, 1919, was 186 and in December, 1920, it was 232. The peak was reached in September, 1920, when the December figure of 232 was attained. While the compilation is based largely, as we understand it, upon city properties, the figures probably are not very far from being representative of the industry as a whole, though to get the average wages per hour an allowance would have to be made for the way in which the wages were loaded; that is, the allowances made for overtime, making out reports, etc.

In changing their wage schedules it is obvious that electric railway companies cannot follow the course open to manufacturers when operation ceases to be profitable, namely, to shut down for a week or a month, then re-engage a staff. We believe, however, that when the proper time comes for a readjustment the men as a whole will meet the companies in the matter of wages in a broadminded way, recognizing its reason in lower living costs. But we also want to point out very distinctly that lower labor costs may be obtained in other ways than by reducing the maximum rate per hour.

One of these ways is to modify the loadings on the wage scale to which reference has already been made. Another method is to extend the period before the highest rate is paid. We believe the present period of one or two years, as established by the War Labor Board, is entirely too short, both as a matter of justice to the men and as a rating for efficiency in operation. It often takes a year or more for a man really to decide whether he likes the railway business and is fitted for it. It is hardly fair for such a man and for the man who takes up railroading as a stop gap between other lines of work when his own trade is dull to be able within a year or two to be put on a par, as to wages, with the men of longer training. Five years is a fairer period. A man who has worked that time with satisfaction to himself and to the company may be regarded practically as a fixture, and such a man is worth more to the company.

More extended use of the one-man car offers another means of maintaining high wages, while reducing operating expenses. The opposition of organized labor to this car is growing less, if we take as a criterion the acceptance by the men of the Eastern Massachusetts Street Railway of the decision in favor of these cars rendered on Nov. 8 by the Massachusetts Department of Public Utilities. In this connection it is well for any wage schedule to define the usual bonus for one-man car operation in percentage of the basic scale rather than

in cents per car-hour, so as to simplify such changes as may be necessary from time to time by making them refer directly to the basic rates.

We see also in the coming year a better grade of employee seeking engagement in electric railway work. In the past, before the hectic period in industrial production during the war, electric railway employment appealed to men who wanted continuous service, in season and out of season, and who were not afraid to work. During the war, many good railway employees left because of the high wages paid in other industries. But those who stayed on now realize that theirs was the wiser course. Steady work at regular pay is far better in the long run than a somewhat higher hourly rate in a job which may stop any day, and no one realizes this more now than the motormen and conductors who have stuck to their positions during the past few years.

The Interurbans Require Greater Attention

INTERURBAN development has been practically at a standstill during the year just closed. The reason for this situation is of course the inability of the companies to finance new capital issues. Despite further fare increases during the year on a great many interurban properties, advances in operating expenses have nearly kept pace with them, so that the year is closing with little financial improvement over that prevailing Jan. 1, 1920.

To this general condition the competition of the private automobile, the motor bus and motor truck have contributed an increasing pressure. While we thoroughly doubt the likelihood of the motor bus or motor truck supplanting the electric interurban in any far-reaching way, yet the immediate effect is serious, for the advent of this new, much advertised, much over-rated form of transportation has brought a formidable doubt into the mind of the investor as to whether his money may be invested safely and wisely in the electric interurban. This, then, would seem to be a temporary condition which may be remedied as time affords experience on what the limitations of the automotive vehicles are, on how better to meet this competition and on how to "sell" electric interurban transportation.

We feel that these things indicate that the interurban situation is more difficult than has been generally realized, judging from the scant attention given during the year to exclusively interurban problems. Little effort has been devoted to detail and searching studies looking to the betterment of operating practices and coincident economy. Hence we feel that the year 1921 must see more attention given to the interurban problems in association activities and in the thinking of the industry generally.

Looking into 1921, it seems to us that certain desirable lines of activity are apparent from an analysis of conditions that prevailed in 1920. The new year should be made to bring changes—changes looking toward improved earnings and decreased expenses. For example, there is opportunity for great improvement in the system of fare collection, judging by the experience of the several companies that have installed a zone check system of identifying passengers and checking turn-in. There is much to be done in the way of schedule revision to make the service more nearly fit the traffic available. This applies to both freight and passenger service and implies in one case

the substitution of every-other-day instead of every-day shipment of l.c.l. matter from way stations where there is not adequate business to justify the handling of a car a day for that station, and in the other case, the arrangement of departure time of cars to fit traffic, without regard to the position of the hands of the clock. There is much saving to be accomplished by the application of energy saving devices which in most cases can be counted upon to finance themselves through the savings made at the coal pile. There is also a splendid opportunity to apply principles of merchandising to the sale of interurban transportation.

Again, there is the possibility of increasing fares. On some properties a further increase is justified and could wisely be asked and inaugurated. However, on many others, if one is to judge by the experience the steam roads are now having with traffic dropping off, undoubtedly due in large part (at least as far as the non-necessity riders are concerned) to the heavy fare increase, it may be well to be very cautious about increasing fares above the present level.

All these suggestions thus far may be put into practice without requiring new money. There are many other things that can be done to great advantage if the general condition of the money market and position of the individual company is such as to make possible the necessary financing. For example, a further standardization of equipment and provision of other facilities for an expansion of interchange service between properties offer a field for increasing earnings, particularly in the Middle West. This would improve passenger traffic and open the way for a very substantial increase in the amount of high-rate package freight carried. Even if it is impractical to undertake the handling of carload freight in a large way there is an enormous amount of this l.c.l. business which the interurbans can secure by virtue of superior service. In case after case it is lack of facilities to handle the volume of business that would be offered, that is turning this business to the steam roads and more recently to the motor truck companies. And the latter are likely to develop into formidable competitors unless the electric railways go after this business in a big way and expand facilities to handle it in a big way. In this connection, there is also the possibility of employing motor trucks as feeders of l.c.l. business to the interurban line, the railway company either owning such truck lines or co-operating with separate companies owning them.

One of the projects that would be of enormous value to most interurban lines is the building of new entrances into large terminals to avoid running over public streets. Unfortunately this usually involves enormous capital expenditures, yet there are two or three cases where such a project is awaiting only more favorable material and labor prices. High-speed service has produced a marked increase in passenger traffic on one important road. This service was anticipated by improvements to roadbed and the purchase of cars. Another and

very important economy of which advantage may be taken is that afforded by the automatic substation. The labor saving, power saving and better voltage regulation made possible warrant serious consideration being given this means of reducing the cost of energy.

As to the outlook for the building of new interurban lines, it is entirely possible that the expected reduction in material and labor costs will start a number of new projects. The proposed line between Dallas and Wichita Falls, Tex., is practically assured under improved general economic conditions. There are also a number of other lines proposed in the Middle West as substantial extensions to present systems which may be expected to materialize with return of conditions more favorable to such work. It is also a fact that serious consideration will be and should be given to the use of the motor bus in many locations needing new transportation lines. For it is in matter of first cost that the motor bus line has its principal advantage over the electric interurban. The possibility of expanding present systems by this means can well be studied by interurban managements, which will thus co-ordinate the motor bus with the railway rather than permit it to become a competitor.

From these various aspects it seems that the year 1921 should be a very active one in the interurban field, particularly so because of the many things within reach to be done and the inactivity of the past year.

Annual Statistical Compilations Show Improved Conditions During 1920

IN THIS issue will be found the annual compilations showing in detail all new rolling stock ordered, track extensions, track reconstructed or rebuilt, together with comparative figures for the past ten years. There are also tables showing track abandoned and ripped up as well as track on which service has been entirely suspended without removing the track.

It appears from the summaries of cars ordered that conditions in the industry are somewhat better than a year ago inasmuch as the number of cars ordered is approximately 50 per cent greater than in 1919. The same conclusions can be reached from the table of companies that have gone into the hands of receivers during 1920. The number is materially less than in the previous year and the amount of securities is likewise smaller inasmuch as the number of large companies involved is less.

Taken as a whole, conditions seem to be somewhat improved for the manufacturer. This is no doubt due to the results of the several fare increases which are gradually restoring the purchasing power of railways to about the condition that should have existed during the war period. With the decrease now impending in the cost of supplies and the better conditions existing in the labor market an optimistic view is taken that 1921 purchases should exceed those of the past year.

Quotation from the Federal Electric Railways Commission Report

No. 1

THE electric railway furnishing transportation upon rails is an essential public utility and should have the sympathetic understanding and co-operation of the public if it is to continue to perform a useful public service.

The experience of seventy-five years, the unanimous opinion of expert witnesses, and of those who are students of transportation problems, and the assumption of the necessity for tracks by inventors working to improve the methods of street transportation alike demonstrate the fundamental and permanently essential nature of the railway—and to the present time of the electric railway—as the most nearly adequate, reliable and satisfactory system available for transporting the maximum number of people through the streets of our cities with the least interference with the use of these streets for other purposes of public ways.

Ask the Car Rider

President Gadsden Says the Outstanding Problems of the Industry Must Be Eventually Answered to Satisfy the Car Rider—The Uppermost Problem of the Industry Is to Rectify the Credit of the Railways—This Is an Inside Problem with the Public Co-operating—There Is No Time Like the Present to Do Whatever Housecleaning Is Necessary in the Industry

By Harold V. Bozell

“ASK the car rider.’ How would that do for a slogan to test the answer as to what to do in the various problems facing the electric railway?” said Philip H. Gadsden, president of the American Electric Railway Association, as he was discussing the outstanding problems confronting the industry and what the industry itself could do to solve these problems.

Mr. Gadsden was sitting at his desk in the United Gas Improvement Company Building in Philadelphia, where he directs the public relations work of a large group of public utilities. And good public relations are uppermost in his mind as the real rock bottom solution of most public utility problems of the day.

He is a straight and fearless thinker—and doer—this new president of the association. He is wrapped up in his work and is fully conscious of both the responsibilities and the opportunities of his new position as representative head of one of the country’s greatest industries. He is anxious to do what he can to effect progress in the electric railway business and he tries clearly to outline the difficulties ahead. One is impressed with his desire to face all problems and facts as they are and not to dodge an issue because it may be unpleasant or distasteful. He had a great opportunity to test public and group opinion when he served on the Federal Electric Railways Commission, which he was instrumental in forming and for which the industry owes him its gratitude, and he is acting with that experience as a background.

He wants the railways to win public confidence, which after all is the basis of the credit so badly needed.

It is a pleasure to talk to him and gain his inspiration.

“The car rider will usually have the correct answer, in simple language, to many questions which confront us,” he continued. “Ask the car rider, for instance, if he wants to pay for paving between the tracks. Ask the car rider what sort of service he wants, and if he is willing to pay for it. It really is a pretty good test of our own conclusions to try to predict what the car rider’s answer will be to most of the problems confronting the industry today.”

“What do you consider the uppermost problem of the industry to be, Mr. Gadsden? What are the things which the industry itself can do so that it may better perform its functions?”

“Restoration of credit is, of course, the uppermost problem that we have in front of us today. We must approach this problem squarely. It appears now that

the work of getting a recognition by electric railway men themselves of the part the industry itself must play in this restoration of credit will prove to be even harder than the restoration of credit once the recognition is given. But the men in the industry must realize, 100 per cent, that it is largely an inside problem.

“Electric railway men must recognize that they and they primarily have to do whatever necessity demands in order to rectify this credit situation. Much of what has to be done may not be liked by some people, but this much is certain: It is absolutely essential that present investment be stabilized before it is possible to invite or induce new capital to come in and there are certain economic principles with which it is necessary to comply before

this can be accomplished. Railway men must get down to brass tacks, study economics and the car rider’s mind, and do the necessary things no matter how distasteful they may be.”

“You regard it as an internal problem then, and not one to be passed on to the public?”

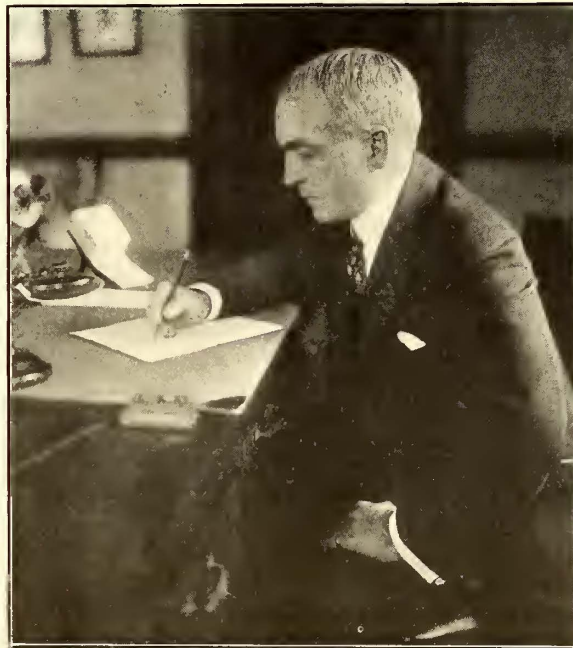
“Yes.”

“Have you any suggestions as to the actual road which the industry must travel in order to restore this credit?”

THE INDUSTRY SHOULD ANNOUNCE ITS STAND

“For one thing, it must be recognized that not only is it an internal problem but that it is a problem for the industry, as an industry, to do. There is such an interrelation existing between the various electric railway properties that it is not a problem for individual action here and there over the country, but it is a problem for the industry as a whole, in so far as general principles are concerned.

“The program which I favor very much would be to



PHILIP H. GADSDEN
President American Electric Railway Association

have the industry state in a formal way, make a public announcement, that it accepts in principle the report of the Federal Electric Railways Commission and also the report of the public utilities committee of the United States Chamber of Commerce.

"The industry should announce that it recognizes the principles laid down in these reports as voicing the best informed opinion of the public as in the interests of restoring the credit of the industry. The people, through two disinterested bodies, have expressed their conclusions and they deserve, and will demand, to know where the railways stand."

"I think this would be an excellent move for the American Electric Railway Association to make. As representing the industry as a whole, the association could make the announcement mentioned above and say that the railways of the country are prepared to go along that line of action if the public itself is willing to do likewise.

"Naturally, each locality has its special problems and must work out the details of the case in view of the particular conditions surrounding that case. But, broadly considered, it is a problem for the whole industry, and the industry must be treated as a whole. I repeat that it must not be forgotten that each and every electric railway suffers from the wrongdoings and mistakes or weaknesses of other railways and investors quite generally refuse to put their money in particular railways until the stability of the whole field has been established. From this line of argument I draw my conclusion that we must do it as an industry, and probably through the association as the mouthpiece of the industry. Therefore, it will be very helpful if the association itself would come out with a formal statement along these lines."

"Wasn't a great opportunity, psychologically, just passed at the convention at Atlantic City, when such an action might well have been taken? It would have been a dramatic move, surely."

"Personally, I think that is true. Some of my best friends disagree with it, but that merely emphasizes what I said before that one problem which we must work out within the industry by ourselves is to gain an appreciation of our own opportunities and duties in this connection, to realize that it is our own problem and that we must, as an industry, state the platform on which we stand."

"How can the industry now best place this report before the public, and incidentally before itself?"

"The association's publicity committee is working on that now, and I have some ideas which we are formulating and which contemplate playing up in brief form and in some attractive way the conclusions and outstanding points in the analysis of the Federal Electric Railways Commission report and having this widely distributed over the country in railway offices, on car cards, and for use in various publications. We must use every means, of course. The details will be worked out by the committee."

"Mr. Gadsden, you have mentioned from time to time the suggestion that it would be wise for electric railways to modify their financial structures in such a way that the capitalization equals the officially approved or determined valuation. Won't you state your views on this

concretely, and indicate how it would help solve this credit situation?"

"To answer that, let me first call attention to some provisions of any service-at-cost arrangement from whose study we may profit. You know I favor that form of contract. Now, to my mind there are two features to 'service at cost' from the standpoint of the restoration of credit. These are: First, that there is an official valuation of the property; and, second, a re-adjustment of securities of the property to conform to the valuation so found. This is an essential under such a form of contract, for as a rule these contracts guarantee a certain fixed dividend on outstanding stock. The limited experience which we have had with 'service at cost' tends strongly to show that this process has been largely instrumental in restoring public confidence in securities so readjusted, and to show further, and this, to my mind, is the greatest result, that there has been a building up of a local market for the kind of securities mentioned.

OPPORTUNITY FOR EXECUTIVE FORESIGHT

"If this is a correct statement of facts it seems very clear that the nearer the electric railways as an industry can conform their own financial set-ups to those principles the greater chance will they have of restoring the credit of the industry and building up a local demand for traction securities.

"Of course all of us realize the many difficulties in the way of bringing this about, but my own judgment is that the railway executive who is far-seeing enough to realize this situation and take advantage of it is going to place his property in a much more wholesome and healthy condition than one who does not."

"Certainly the electric railways today have nothing to fear from fair valuation of their property. Taking whatever basis of determining fair value is finally agreed upon, it is impossible to make a valuation without recognizing the real intrinsic worth of the public utility and of arriving at a valuation which is fair to all concerned. We all know that in many cases the value, when found, equals and sometimes exceeds the capitalization. But whether it does or not, I believe the principle is a sound one to follow. The car rider can understand it, for one thing.

"There are many good men in the industry who do not agree with this viewpoint, but from the contact with all sorts of opinions which it was possible for me to gain in my experience on the Federal Electric Railways Commission I am thoroughly convinced that this would be a most healthy program for the railways to follow. It is one of the things which the railways themselves can do, and which if forced upon them from the outside will react only to the great detriment of electric railways in the further destruction of electric railway credit.

"With reference to the necessary new capital required from year to year to provide the extensions of the railway facilities demanded by the growth of our various communities, I think it ought to be impressed upon the public that unless the conditions and restrictions now imposed upon us, and which are largely responsible for our present want of credit, are removed there is very

great danger that whether the American public wants it or not the electric railways will be forced into the hands of municipalities, for the reason that if conditions are such that private capital will not go back into the industry public credit must. The issue to my mind, therefore, is squarely made:

"If the American public, as there can be no doubt, are opposed to the municipalization of their public utilities, and especially of their traction systems, it is incumbent upon them to co-operate with the railway executives in doing whatever must be done to make investment in electric railway securities attractive to the private investor. We have been talking about steps which should be taken by railway executives to restore the confidence of the public. This is one thing which the public, it seems to me, can and must do.

"What do you think of the application or the use of non-par value stock as an answer to the problem of restoring the credit or stabilizing the finances of the electric railway industry today?"

"I think it offers a very satisfactory and equitable solution of a most difficult and vexing problem. Stock is, of course, nothing more nor less than a right to share in the earnings of a company, and it appears to me that our corporate industries, and certainly our public utilities, would be in much better shape if the stock were issued on a non-par value basis. Every one is fully protected; the return is allowed upon the actual property in the service of the public; the fixed charges of interest on bonds, which would of necessity be conservatively floated, would be recognized by all and the non-par value stock would gain its earnings in proportion to the service rendered by the electric railway and the efficiency with which that service was rendered.

"In this discussion I wish it to be understood that I am convinced that the question of bonus stock or so-called overcapitalization has been greatly exaggerated in the public mind and that whatever bonus stock was issued was necessary in the promotion days. That does not eliminate, however, the vulnerable feature today, and we should recognize that fact.

"There are two ways of strengthening the basic financial structure. One of these is to adjust the securities until their par value equals the valuation of the property, and the other, and I believe much more preferable way, is to change to non-par value stock.

"I am very hopeful that the industry will face this problem squarely, realizing that it is an internal problem, and that the financial structures of the various companies will be made simple enough for the car riders to understand. Understand me, I favor no change in the total return on account of any shift in par value; that is determined by the actual valuation of the property. I am not criticising, but rather upholding, the corporate organizations and financial structures as they have had to be built in the past. But to meet present-day conditions and present-day public policy some change is desirable in the capital structure of some of our companies."

"There is another question which seems to be preying upon the minds of the public in many places, and that is the one of underlying leases. It has been used by political demagogues so often that a discussion of it is pertinent, at least."

"That, it appears to me, is merely another question of inside-the-house cleaning. The public isn't interested at all fundamentally in what our arrangements are with each other, so long as it realizes that all it is paying is a fair return on the fair valuation. But I think we must realize that the time has come when the public will insist upon paying only a fair return on a fair valuation and that we must make our own arrangements with each other, so that we can exist individually and collectively on that basis. Naturally, fixed leases made a good many years ago are points of attack for politicians, whether they have any effect on the actual rate of fare paid by the car rider or not, but what the car rider will insist upon is that they do not have any such effect. His attitude is: 'What's your total property worth? What does my ride cost, with a fair profit to you? Eight cents? Ten cents? Well, take my dime and divide it any way you want to.'"

"To refer again to the service-at-cost franchise principle which you mentioned, its adoption was one of the recommendations of the Federal Electric Railways Commission, was it not?"

SERVICE-AT-COST ADVANTAGES

"Yes, it was suggested as a fair solution, and I see many advantages to that form of contract. There are places, of course, where difficulties have been found with the particular form of contract made and none of the service-at-cost franchises is perfect in providing a real incentive to management. That problem must yet be worked out. But at bottom there is real incentive to the owners.

"I think the following is a fair statement: capital is fluid, in other words, it flows to attractive conditions, and if the cost of money is, say, 8 per cent and this is sufficiently protected in the terms of a service-at-cost franchise and backed by public opinion, there should really be no necessary added incentive to induce capital to go into an electric railway operating under such a franchise. Service-at-cost franchises recognize that the electric railway business is an investment business and not a speculative business any longer. But I do think there should be some incentive to better management and I am hopeful that there will be a real way found to include this satisfactorily in such transactions in the future.

"Still, as to management, it appears to me that there should be no reason to doubt that there will be good service. Just consider the general manager; his professional reputation rests upon the results he obtains; he is compared with managers in other communities; a certain morale is thus created which is worth more than any monetary reward.

"As a matter of fact, I believe that the morale in public utility business is extraordinarily high, and in the electric railway business this is specially true. I often compare it to the morale of a good military force. Certainly during the past trying years electric railway managements have measured up to the highest standard of public duty.

"But I must admit that a solution satisfactory to all with reference to the proper recognition of good management under service-at-cost franchises has not yet been found."

"There are two other points of interest to railways

today, Mr. Gadsden, that it would be profitable to have you say a word on if you will. These are labor conditions and the place of the motor bus. One question with reference to the former is the wage scale. Certain cuts in wages have already been made in other industries and what is the future on the railways?"

"Well, we must first recognize that we can't expect to lower the wage scale until a reduction in living costs has become a fact—so that the electric railway man on any new scale can live as well as he can now. In other words, the method of determination of satisfactory wages will be somewhat on the basis of their determination during the war when living conditions were taken into account.

"With reference to the cuts which have been made in other industries, I interpret this as meaning that labor in industries which are not public utilities prefer to work at a partly reduced compensation rather than to run the risk of having the industry close down entirely. We must recognize the fact that public utility labor does not have this fear, for it knows it is in a business which must continue to run and it would fight reductions to the limit.

WAGE SCALES AND COLLECTIVE BARGAINING

"I do see a way in the future, however, when living conditions have lowered sufficiently to make it possible for railways to get help at lower wages, and this is already beginning to be the case; what I have in mind is to make no change in the agreement with the men now on the railways, but to take on new men at lower rates, leaving the higher rates for men of long service and greater ability. I notice that the ELECTRIC RAILWAY JOURNAL has proposed this plan editorially as a solution, and I think it is a wise one. I think it is a solution which should appeal to labor as well as to the railways as the easiest means of going back down the scale as the general price level recedes."

"And as to organized labor or the open shop?"

"Well, all I can do is to give my opinion as a result of my own individual experiences, but I think there is no doubt of the fact that every one recognizes the right of labor to organize today or, expressed in another way, the right of collective bargaining. If that is the case, and the men on a given property decide to get together, I believe there is greater harmony and unquestionably greater efficiency, as a matter of practice, if the men all go in or all stay out. In other words, let the representatives of the men represent all the men rather than having various groups continually coming to the management. The men are better in one organization and not broken into groups. This is another inside-the-family arrangement, with the family in this case in the rank and file of the men themselves. But managers and executives of properties should reserve the right in the first instance to engage men either in an organization or out of it.

"One of the points emphasized by the commission in its re-

port is the necessity of working out some plan by which harmonious relations can be maintained between the managements and the men, and strikes thereby avoided, as one of the essentials to the restoration of the credit of the industry. I think we cannot emphasize the point too strongly. The investor naturally hesitates to invest his money in an industry which is subject to recurring interruptions of service growing out of controversies, over either wages or service, between the management and the men.

"Therefore, in the highest interests of the property itself, a serious effort should be made to arrive at some satisfactory relation within the industry. But I feel that the details of the problem of how to work out relations between labor and management are for each individual property to work out to fit its conditions, though we may be able to arrive at some fundamental conceptions common to all."

"And what of the railways and the motor bus?"

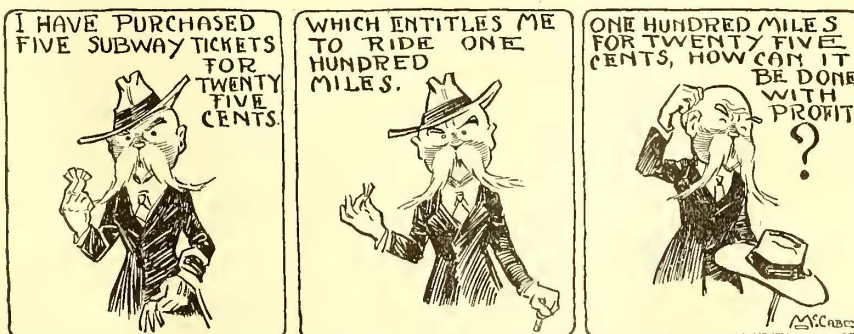
"I can't see any answer to this question except that the railways themselves must adopt and use the motor bus in its correct economic sphere. It may sometimes mean running motor buses at a loss, but it is better to run them at a small loss than to be forced to run cars on rails at a higher loss. The motor bus certainly has a field as a feeder, as an auxiliary service, and probably in the handling of peak loads where it does not pay to install extra trackage. Competition, unregulated or regulated, will bring no good to either system of transportation."

"You are optimistic as to the future?"

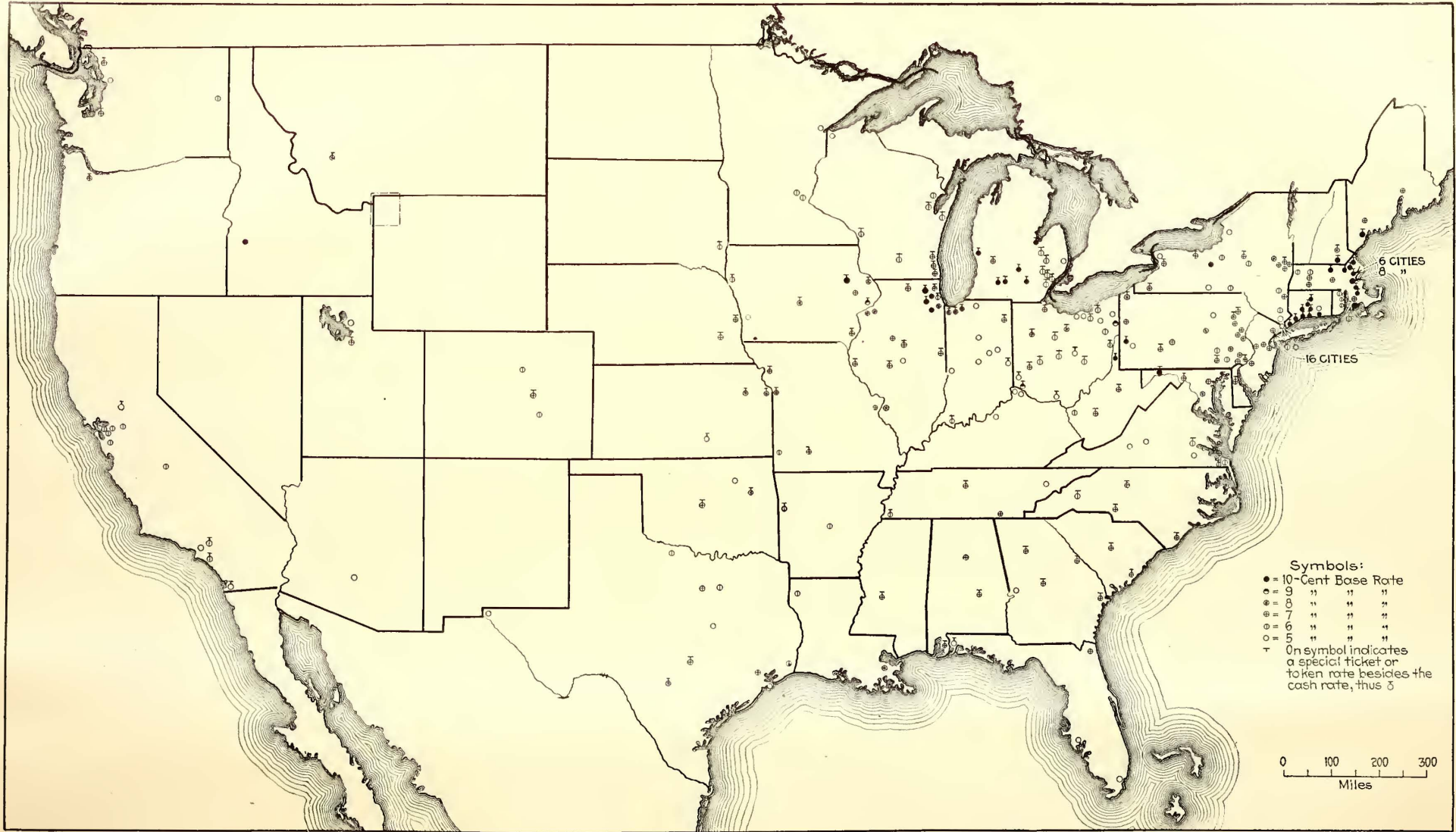
"One cannot study the electric railway situation and feel otherwise. As has been pointed out so many times, the electric railways are an absolute essential of community life. The testimony before the commission proved conclusively that their usefulness to their respective communities had increased rather than diminished, notwithstanding the extraordinary development of the automobile.

"As a rule, the electric railways have succeeded, at last, in securing rates of fare fairly commensurate with the service they are rendering. If we can succeed in maintaining these rates of fare, in the face of the prospect of a general decline in the cost of labor and material, the outlook for electric railways is very encouraging. While industry generally is slowing down, the experience of the past has shown that the business of the electric railways is affected but little

by industrial depression. This in the past has made electric railway securities favorite investments on the part of the public, and, in my judgment, we are again approaching the period when our securities will be sought after by prudent careful investors."



HOW McCABE HAS PICTURED HIS CAR RIDER CHARACTER, "THE COLONEL" WITH A QUESTION HE CAN'T ANSWER



**A Graphical Portrayal of the Electric Railway Fare Situation in the United States Today.
 Symbolic Representation of Base Fares in Use in Cities of 25,000 Population
 or Over. Zone Fares Are Not Differentiated**

Our National Fare Experiment

How the Industry Has Tried to Meet the Problem of Continuing Adequate Service Without Imposing Burdensome Rates—Ever-Increasing Costs Have Kept One Lap Ahead of Fares—The Industry Has Delayed Fare Increases and Has Tried Zone Systems to Minimize Demands on Public's Pocketbook—Now that Fares Begin to Be Commensurate with Cost, Large Cumulative Deficit of Recent Years Is a Problem

By *Lucius S. Storrs*

President the Connecticut Company, New Haven, Conn.
Past-President American Electric Railway Association

DURING the past five or six years all industry has had to meet unforeseen and unprecedented conditions, as every one knows. Private business has met these conditions in various ways, but usually according to practices which were not different from its ordinary ones; that is, the usual law of competition and supply and demand was allowed to hold sway. Some business enterprises, which had never before been subjected to regulation, have had to conform to certain government restrictions and rules, and in some cases even to turn over operation, or at least direction, to government agencies.

Through all this period the public utilities, and especially the electric railways, have had even more difficulty in keeping their business in successful operation. This statement, of course, is not novel either to electric railway men or to users of electric railway service. But in these new conditions there has been a continual struggle to keep properties alive and in operation, and the character of this struggle, viewed from the knowledge of today, appears to be a gigantic experiment in street railway fares from which the industry and the public may both learn some lessons. From this statement it is not to be inferred that the experiment is at an end and that final conclusions may be drawn, but rather that it is well to take stock of the fare development since 1914-15 to see where the industry is headed.

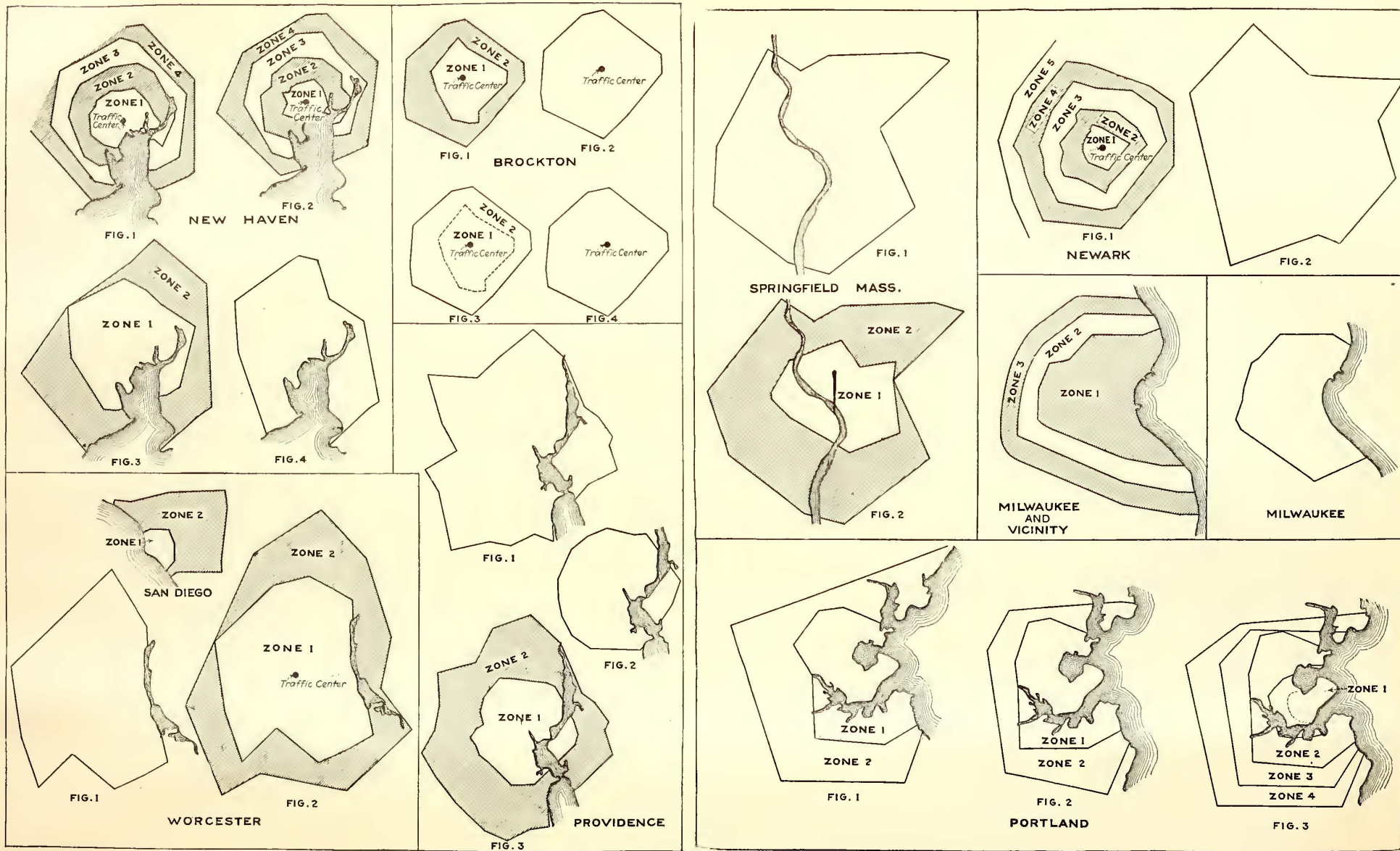
In this study there is no idea of duplicating the various fare studies and fare reports which have been made from time to time by the ELECTRIC RAILWAY JOURNAL and the American Electric Railway Association. Rather, it is the purpose to take a broad view of the subject as reflected by these various reports. Since 1914-15 the news columns of the ELECTRIC RAILWAY JOURNAL, for example, have carried item after item of "Fare Increase Sought," "Fare Increase Granted," "Six Cents in Smithville," "Seven Cents in Jamestown," "Another Increase Needed," "Eight Cents in Brownburg," "Ten-Cent Fare Granted in Jonesboro," and so on. From time to time the American Electric Railway Association has issued lists showing the fares in the leading cities. The last such list depicting the fare situation in all cities over 25,000 population, as of approximately five weeks ago, was published by the Association in *Aera* for December. This information, brought up to the date of this article, is shown graphically on an accompanying map of the United States, which has been prepared by the ELECTRIC RAILWAY JOURNAL. It gives a beautiful and telling story of the present fare situation in the country. Just a glance at the map indicates the variety of results which have been arrived at in this vast and nationwide experiment to solve the fare question. Practically every city indicated

on the map has had a change in the unit rate of fare or fare system since 1914-15.

The premise upon which this article is based is that in 1914-15 there existed in this country throughout the electric railway industry a more or less standardized flat fare system of five cents for all urban rides. Usually free transfers were given—the so-called universal transfer system, in other words. Whether this was a situation which, upon complete and unbiased, social and scientific analysis, was the best that could be devised or was the most equitable to all interests involved need not enter into this discussion. There are some who believe that a distance tariff, such as is in vogue in many foreign countries, should have been in existence in this country at that time. There are some who believe that, even on a flat fare basis, it would have been possible to furnish transportation at less than 5 cents per passenger. But there are many operators who have had to furnish the service and many financial men who have tried to provide the wherewithal for proper growth of facilities who know or believe that, taken the United States over, the electric railway industry was not paying all expenses, making all necessary maintenance and depreciation charges and giving an adequate return to the capital which had made the industry possible on the 5-cent fare basis. Labor in the industry was admittedly, as viewed from facts now known, paid none too well. As has been stated by one public service commissioner, the public wanted a service at a price which demanded cheap labor and it got it.

But be these conditions as they were, debatable though they may be, the facts remain that at the beginning of the economic upheaval caused by the great war the electric railways of the country were operating and giving fair service, in many places wonderful service, for 5 cents. The story of constantly increasing costs in materials, of constant readjustments of labor contracts and of constantly rising costs of operation in general is not new. Nor is it giving any information to repeat the story of the continuous fare increases and adjustments with which every one is familiar in a hazy or general way. But, viewing the history of the whole industry from the knowledge of today, there is one fact that seems certain. As a nationwide average there has been a time lag of fare increases behind increases in operating costs which has caused a deficit to be created, and this deficit is one of the factors to be considered by railways and commissions in adjusting conditions of today and for the future.

But most important to note, from the standpoint of the public at least, and most gratifying to those who would have faith in the future of the industry, is to realize the attitude of those responsible for railway



Zonal Areas or Fare Limits Adopted by Various Cities in Changing Fare Systems

The population, zonal areas and present fare systems of the cities shown here are given at the bottom of the page facing this illustration. The fare history of each is given in the accompanying text.

(These maps are to the same scale as those on page 16)

operation in this gradual increase in rates. To the writer's mind, the weighted national average situation shows that the railways have been most moderate in the fare increases requested. It is apparent that the following factors have been in the minds of railway men responsible: That the service must be kept up for the benefit of the public at all costs; that inescapable increases of costs were upon the railways; that whatever fare increases were necessary to meet these increases in costs should be as moderate as possible so that the public, which had to pay the bill, would be burdened as little as possible. As a result, the average situation has shown that the fare advance has been too moderate for the best interests of all; too moderate especially for the best interests of the public, as a matter of fact. To state it in other words, the average railway management has naturally desired to have income overtake outgo, but has made increases in fare barely adequate to make this possible, figured on the most favorable basis, and no sooner has the increase been put into effect than costs have taken another jump and the condition was as bad as before. Then, too, the anticipated falling off in riding has occurred in a greater or less degree, following fare increases. To say this in another way, every one realizes that 100 per cent of the riders will not ride at any increase in fare—some will walk or use other means, private or public, depending upon conditions.

As explained more in detail later on, the result of all this has been a partial, and sometimes complete, disregard of a return to the actual money invested in the various properties through non-payment of interest and dividends. In other words, the owners of the various properties have contributed the physical property itself to a continuous service to the public without any immediate return. It does not pay to refuse, ostrich like, to face the fact that a part of the public—the politicians in the lead—claim that this is only a fair repayment of the traditional excessive profits supposed to have been made by former promoters and owners of traction properties. The industry must make it known that today's owners have made this contribution to the continued service to the public, with a purpose which has been socially patriotic.

Two criticisms might be made of railway managements in this connection.

One of these is that the managements, realizing, as most of them must have done, that at the time of each

increase of fare the increase in cost had not ended and that the fare increase would prove insufficient only too soon, have lacked the courage to present their cases for increases that would really be effective. From the standpoint of the public, as is known to be the case now, this would have been the better thing to do, for the railways would have been in a position to extend and develop the service which the public desired and demanded. The other possible criticism is that the railway managements did not have the salesmanship to gain the increases which they knew to be necessary. There is no doubt that the electric railway as an industry has not had a sales attitude, but rather a service and operating attitude.

It is more generous, however, and probably more nearly correct, to believe that the managements have, in each case, felt that they were doing the best thing to keep the fare increase at the lowest possible figure in the hope that the peak had been reached and that the property would be successful under the new rate.

In other industries increases were made by leaps and jumps of from 100 to 250 per cent in case after case. In only a few instances have electric railways taken the full jump at once from the former fare to a fare which was felt to be really adequate and effective.

To make plain the points which have been made above, it is believed worth while to mention the history of a few of the individual experiments which have been made. There have been two general sorts of attempts. One of these has been the gradual increase of flat fares, retaining the old limits, which were usually on the 5-cent basis. The other has been through the application of a distance tariff, under which the passenger pays for the actual distance of the ride, or through a lessening of the distance of the initial fare zone. Most of the latter experiments have been made in New England. The cases which are here quoted are selected at random, so to speak, and merely to show the various kinds and percentages of fare changes which have been made. There is no "typical" case which can be cited. They all differ.

Chicago, Ill.

In Chicago, where the company waited some time for its increase and where the situation was almost as complicated politically as it is in New York, the management did have the courage to ask at the first for a rate of fare which seemed to be fully commensurate with

DETAILED DATA TO ACCOMPANY ZONAL AREA DIAGRAMS ON PAGE 12

New Haven — Population 162,519*			
Fig. 1	Area zone 1	4.66 sq. mi.	} Present fare 10c. flat, Fig. 4. Commutation books for suburban riders for trips in 5 suburban zones or more from traffic centers are sold.
	Area zones 1 and 2	12.19 sq. mi.	
	Area zones 1 to 3	22.08 sq. mi.	
	Area zones 1 to 4	31.97 sq. mi.	
Fig. 2	Area zone 1	2.24 sq. mi.	} Present fare 7c. in each zone.
	Area zones 1 and 2	8.50 sq. mi.	
	Area zones 1 to 3	15.95 sq. mi.	
	Area zones 1 to 4	28.00 sq. mi.	
Fig. 3	Area zone 1	18.13 sq. mi.	} Present fare 7c. flat, 1c. transfer charge.
Fig. 4	Area zones 1 and 2	41.43 sq. mi.	
	Area	26.48 sq. mi.	
Brockton—Population 66,138			
Fig. 1	Area zone 1	6.81 sq. mi.	} Present fare 10c. cash, 14 tickets for \$1 (To traffic center only).
Fig. 2	Area zones 1 and 2	18.27 sq. mi.	
Fig. 3	Area zone 1	6.81 sq. mi.	
Fig. 4	Area zones 1 and 2	18.27 sq. mi.	
Worcester — Population 179,754			
Fig. 1	Area	39.54 sq. mi.	} Present fare 7c. in city zone and 6c. in outside zones.
Fig. 2	Area zone 1	36.92 sq. mi.	
	Area zones 1 and 2	72.65 sq. mi.	
Providence — Population 237,595			
Fig. 1	Area	44.00 sq. mi.	} Present fare 6c. in each zone.
Fig. 2	Area	17.94 sq. mi.	
Fig. 3	Area zone 1	12.87 sq. mi.	
	Area zones 1 and 2	44.50 sq. mi.	
San Diego — Population 74,683			
Fig. 1	Area zone 1	1.65 sq. mi.	} 5c. in each zone, 4 tickets for 30c., good in two zones.
	Area zones 1 and 2	12.50 sq. mi.	
Springfield — Population 129,563			
Fig. 1	Area	58.71 sq. mi.	} Present fare 7c. in each zone.
Fig. 2	Area zone 1	15.87 sq. mi.	
	Area zones 1 and 2	62.15 sq. mi.	
Newark — Population 414,216			
Fig. 1	Area zone 1	2.38 sq. mi.	} Present fare 7c. flat, 1c. transfer charge.
	Area zones 1 and 2	8.55 sq. mi.	
	Area zones 1 and 3	22.20 sq. mi.	
	Area zones 1 and 4	31.00 sq. mi.	
Fig. 2	Area	59.00 sq. mi.	
Milwaukee — Population 457,147			
Milwaukee and vicinity:			} Present fare 7c. in zone 1, 8 tickets for 50c., 3c. in outer zones.
	Area zone 1	26.00 sq. mi.	
	Area zones 1 and 2	42.00 sq. mi.	
	Area zones 1 and 3	62.00 sq. mi.	
Milwaukee alone:			
	Area	25.40 sq. mi.	
Portland — Population 69,272			
Fig. 1	Area zone 1	17.00 sq. mi.	} Present fare 10c. cash or 8c. ticket, for ride through 3 zones or less,
	Area zones 1 and 2	49.98 sq. mi.	
Fig. 2	Area zone 1	15.23 sq. mi.	
	Area zones 1 and 2	32.32 sq. mi.	
Fig. 3	Area zone 1	4.19 sq. mi.	
	Area zones 1 and 2	15.91 sq. mi.	
	Area zones 1 and 3	26.62 sq. mi.	
	Area zones 1 and 4	49.94 sq. mi.	

*Population figures are from the 1920 census report.

cost. This was later cut down by the commission, but soon increased to the present fare of 8 cents on the surface lines. The rapid transit, or elevated, lines have another story to tell, but they have finally arrived at 10 cents, with a ticket rate of four for 35 cents. The following tables show the changes made in Chicago:

CHICAGO SURFACE LINES			
Date in Effect	Cash Fare, Cents	Ticket Fare, Cents	Children's Fare, Cents
	5		
Aug. 7, 1919.....	7	Ten for 65 or Fifty for \$3.00	4
Dec. 27, 1919.....	6	None	3
July 1, 1920.....	8	None	4

CHICAGO ELEVATED LINES			
Date in Effect	Cash Fare, Cents	Ticket Fare, Cents	
Nov. 21, 1918.....	5		
Aug. 7, 1919.....	6		
Feb. 1, 1920.....	8		
Aug. 4, 1920.....	10	Two for 15 Four for 35	

Cincinnati, Ohio

Perhaps the most exaggerated example of the moderate fare changes, as costs go up and down, is found in Cincinnati, where the people and the company have agreed on a service-at-cost basis of operation. In a way it is typical of the point which it is desired to make. Without criticising the conditions of the contract, the facts may be stated that a slight increase in fare is allowed at the end of a three-month trial of one fare system, if that one has not paid enough to keep a certain check fund up to a specified amount. On this basis Cincinnati started its service-at-cost operation in August, 1918, with a cash fare of 5 cents and a ticket rate of five for 25 cents. Since then the following table tells the story of fare changes in Cincinnati:

Date in Effect	Adults		Children Under Ten Years	
	Cash Fare, Cents	Ticket Fare, Cents	Cash Fare, Cents	Ticket Fare, Cents
1896 to Dec. 31, 1918.....	5	Five for 25	3	Two for 5
Jan. 1, 1919.....	6	Six for 33	3	Four for 11
Apr. 1, 1919.....	6	Five for 30	3	None
July 1, 1919.....	7	Six for 39	4	Four for 13
Oct. 1, 1919.....	7	Seven for 35	4	Four for 13
June 1, 1920.....	8	Two for 15	4	Four for 13
Sept. 1, 1920.....	8	Five for 40	4	Five for 20
Dec. 1, 1920.....	9	Two for 17 or Six for 51		

It is most important to point out, in connection with the Cincinnati experience, that one of the efforts made to keep the cost of service from going up was that the Director of Street Railways, W. C. Culkins, ordered the local company to reduce the service.

New Orleans, La.

In October, 1918, as the result of the War Labor Board's increase in wages the 5-cent flat fare was increased to 6 cents, and again on Oct. 21, 1920, fares were increased, this time to 8 cents as the result of further wage advances to the employees.

Cleveland, Ohio

Cleveland is the first "service-at-cost" city and since the adoption of the Tayler plan in 1910 there have been various fare changes. Some one remarked recently that the Cleveland public continued to ride in as great numbers at high fares as at low fares and the rejoinder was that "the Cleveland public is trained to railway service the same way that it is trained to general merchandise purchasing; it is merely in the habit of getting on the car and asking the conductor 'how much.'" Since the

Taylor plan was inaugurated fare changes as indicated in the accompanying table have taken place:

Date in Effect	Cash Fare, Cents	Adult Ticket Fare, Cents	Net Transfer Charge, Cents
March 1, 1910.....	3	Five for 15	1
June 1, 1911.....	3	Five for 15	None
Sept. 1, 1914.....	3	Five for 15	1
Dec. 15, 1917.....	4	Three for 10	None
Dec. 26, 1917.....	4	Three for 10	1
April 3, 1918.....	4	Seven for 25	None
April 10, 1918.....	4	Seven for 25	1
Aug. 4, 1918.....	5	Seven for 25	1
July 5, 1919.....	5	Eleven for 50	1
Dec. 15, 1919.....	5	Six for 25	1
May 10, 1920.....	5	Five for 25	1
Nov. 14, 1920.....	6	Nine for 50	1

Boston, Mass.

Boston, Mass., as is well known, is now operated under a board of trustees representing the state. Since attempts have been made to meet rising costs by increasing fares the following changes have been made:

Date in Effect	Cash Fare, Cents	School Ticket, Cents	Exchange Ticket in Chelsea with Bay State, Cents
	5	None	3
Aug. 1, 1918.....	7	None	None
Dec. 1, 1918.....	8	None	None
Jan. 1, 1919.....	8	Ten for 50	None
July 10, 1919.....	10	Ten for 50	None

Washington, D. C.

Washington, D. C., presents an unusual case, in that there are two competitive companies, with entirely different systems. In order to protect the service of each of the two independent companies they have had to be considered together in adjustment of fares. Starting with a 5-cent cash fare, with six tickets for 25 cents, increases have been made as shown herewith:

Date in Effect	Cash Fare, Cents	Ticket Fare, Cents	Company Transfer Charge, Cents	Net Transfer Inter-Company Transfers
Nov. 1, 1918.....	5	Six for 25	Nothing	No transfers
Jan. 15, 1919.....	5	None	Nothing	No transfers
	5	None	Nothing	Free Inter-Company transfers at thirteen points
June 1, 1919.....	5		2	Free
Nov. 1, 1919.....	7	Four for 25	Nothing	Inter-Company transfers, 2 cents
Dec. 13, 1919.....	7	Four for 25	Nothing	Abolished
May 1, 1920.....	8	Four for 30	Nothing	2 cents

Philadelphia, Pa.

Philadelphia is another example of fare increase, which has its own characteristics. Starting with a 5-cent fare, to which was added a 3-cent exchange ticket, or transfer for many of the transfer passengers, the management has held to the theory of a basic 5-cent fare even up to the present. The same story of increasing costs has to be told there too. These were met in Philadelphia by a great increase in riding and by the same devotion of the property or capital to the service of the public without adequate return. But finally even Philadelphia conditions could no longer allow continued operation without fare increase—the last wage increase which had been awarded to the men had to go unpaid—and various schemes were put forth. The management desired a 5-cent fare with no transfers, which would have been one sort of experiment; the Public Service Commission decided that this would be discriminatory against many riders and ordered the company to put into force, temporarily, as another experiment, a 7-cent rate with four tickets for 25 cents where the former 5-cent rate had been in effect, and to continue to sell the 3-cent exchange tickets as usual.

Portland, Ore.

On June 15, 1918, the former 5-cent fare, with free transfers, was changed to 6 cents cash with tickets in lots of five for 30 cents and fifty for \$2.75. Transfers between city and interurban cars were eliminated in December, 1918. On June 15, 1920, the cash fare was raised to 8 cents and all reduced rate tickets abolished.

In order to present more graphically, and possibly more forcibly, the condition of many of the flat fare cities at the present stage of the development there are shown in accompanying illustrations outline maps of several of these cities, with information to show the area served for the flat fare, the population of the corporate city according to the 1920 census figures, and the fare system in force. These maps are all shown to the same scale in order to make the graphic illustration as forceful as possible. These were first published in the ELECTRIC RAILWAY JOURNAL Aug. 5, 1916, accompanying an article by D. J. McGrath, and were later published in "Street Railway Fares," Jackson and McGrath.

The Connecticut Company

Of the other type of fare experiments which have been made, namely, the distance-tariff schemes, the writer's own company, the Connecticut Company, is one example. It is also an example of flat fare changes, both before and after the zone system experiments. Starting with a 5-cent fare, the first change was made in October, 1917, when a rate of 6 cents was established on the old 5-cent limits. By 1919 this was proving to be inadequate and, to avoid any increase on the initial fare, the fare for the short distance rider, a zone system was devised in which zones were laid out of from 1.5 miles at and near urban centers to 0.8 miles in suburban and interurban territory. Taking New Haven as a typical city under this system, there is shown in an accompanying diagram the outline maps of the various zones under this system, which was installed Nov. 2, 1919. In fact, the various schemes are shown in a series of maps. Fig. 4 shows the former 5- and 6-cent city areas. Fig. 2 shows the zones with their areas under the first zone system. Under the first zone system the minimum and initial fare was 6 cents, for which a passenger could ride two zones or less. An additional charge of 2 cents per zone was made after the first two zones. Seventeen 6-cent zone tickets were sold for a dollar. Transfers were issued to allow any passenger to continue his ride for the same charge as if he had stayed on the original car. The traffic center was a zone dividing point in both the first and second zone schemes. As has already been related by the ELECTRIC RAILWAY JOURNAL, this system allowed some increase in revenue, enough to pay operating expenses and some fixed charges, but not all, by any means. It was later modified by what the Connecticut commission hoped would prove to be an improvement. Fig. 2 shows New Haven under the equal-length zone system installed by the commission on May 9, 1920. Under this zone system the cash fare was 3 cents per zone, with a minimum fare of 6 cents. A fifty-zone ticket was sold for \$1, the minimum amount punched in this case being three zones, or 6 cents. There was also a calendar month commutation ticket sold at 1.75 cents per zone for suburban riders traveling five zones or more from the traffic centers of certain sized cities. These commutation tickets were non-transferable and were not good on Sundays and holidays. Under this system, also, transfers were issued to allow any passenger to continue

his ride for the same charge as if he had stayed on the original car. This experiment did not provide as much revenue, comparatively, as the first zone system and was abandoned on Aug. 8, 1920, for a fourth change, from the old 5-cent system, as shown in Fig. 3. In this case a smaller area than the old 5-cent area was put on a 7-cent basis and a 6-cent area about 2 miles long placed outside of this. Suburban lines were put on a basis of 6 cents for 2-mile zones. This presented difficulties in two ways—it neither provided the necessary revenue nor was satisfactory to the public. Finally, on Nov. 1, 1920, a return was made to the old 5-cent areas with a 10-cent fare and commutation tickets under same conditions as before at 2½ cents per mile. Its effect cannot yet be correctly analyzed, for it has been in effect but two months, months that have suffered the general industrial depression. It is only fair to state, however, that from the standpoint of company revenue this system seems to be proving satisfactory. As compared with the corresponding periods of previous years, the increase in fare has not proved so objectionable to the public as might have been anticipated, for the number of passengers carried has decreased but slightly. Estimates in Connecticut are complicated by the jitney problem.

Milwaukee, Wis.

Milwaukee has the distinction of establishing in 1914 the first central area zone system with zones outside of the central area having a zone rate of less than 5 cents.

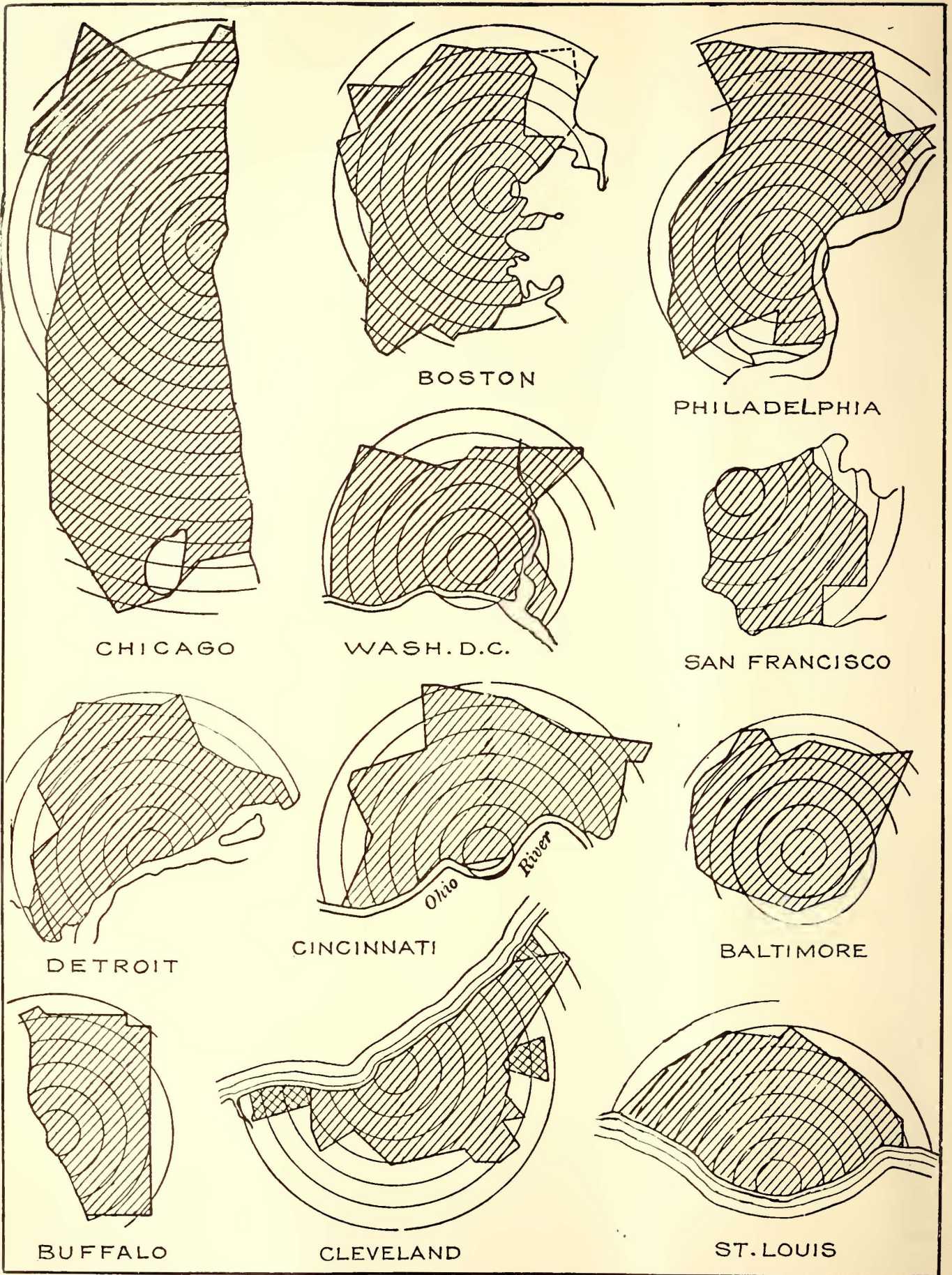
In December, 1913, the unit cash fare for a ride was 5 cents, with twelve tickets for 50 cents, and with free transfers within the one-fare area of Milwaukee, which corresponded approximately to the city limits. On Jan. 18, 1914, a central area zone system was made effective. The limits established at that time are in effect today, although changes have been made in the base fares both in the central area and in the interurban zones. These changes are shown in the following table:

Date Effective	Central Area		Suburban and Interurban Zones			Suburban Ticket Rate, Cents
	Cash Fare, Cents	Ticket Fare, Cents	Cash Fare, Cents	Min. Fare, Cents	No. of Zones	
Jan. 18, 1914...	5	Six for 25, twelve for 50, twenty-five for \$1	2	5	2	.....
Nov. 19, 1914...	5	Six for 25, twelve for 50, twenty-five for \$1	2½	5	2	Thirty for 50
Jan. 30, 1915...	5	Six for 25, twelve for 50, twenty-five for \$1	2½	5	2	Thirty for 50
June, 1918...	5	None	2½	5	2	Thirty for 50
July 3, 1918...	5	None	5	6	2	Thirty for 60
Nov. 2, 1919...	7	Six for 35 or 18 for \$1	3	6	2	Twenty for 60
Feb. 3, 1920...	7	Six for 35 or nine for 50	3	6	2	Twenty for 60
June 7, 1920...	7	Eight for 50	3	6	2	Twenty for 60

Brockton, Mass.

Brockton, Mass., is taken as a typical illustration of the zone system of fares established on the Bay State System. Prior to October, 1917, there was a central area with 5 cents as the unit of fare and with free transfers. On lines extending beyond the central area boundary additional 5-cent zones existed. There were likewise overlaps from the center of the city area and extended transfer privileges and reduced rate tickets at varying rates. On Oct. 15, 1917, the rate of fare in the suburban and interurban zones was increased to 6 cents.

On June 24, 1918, an entirely new zone system (Brockton, Fig. 1) was established. This plan called for a central city zone in which the unit rate of fare was 6 cents cash with free universal transfers, and outlying zones having a base rate of 2 cents each and a minimum fare of 6 cents for three zones or less. Several forms of reduced rate tickets were sold—namely, six for 30 cents



Diagrams Showing Relative Areas of Several Cities Which Operate on a Flat Fare Base

The population and present fare status of the cities shown here are given at the bottom of the page facing this illustration. The concentric circles on these maps are at mile intervals

(These maps are to the same scale as those on page 12.)

and six for 25 cents from the limits of the central zone to the traffic center, without transfer privilege. The latter form of ticket was for off peak travel and good only from 9 a.m. to 4 p.m. Mondays to Fridays inclusive, while the six for 30 cents tickets were good at all times. Two additional tickets of similar nature were sold from points in the first outer zone to the traffic center, namely, seven for 50 cents and four for 25 cents.

On Jan. 8, 1919, the above described central zone was abolished as such and the entire area of the first outside zone included in the central city zone area. (See Brockton, Fig. 2.) In the interurban territory two of the former 2-cent mileage zones were combined and the base rate per zone was made 5 cents. The unit fare, however, either in the central area or the interurban zones, was 10 cents cash, or reduced rate tickets good for a single zone ride were sold in lots of five for 35 cents. On July 1, 1919, the five for 35 cents reduced rate ticket was abolished. On Nov. 23, 1919, a new ticket rate was established from the limits of the central area to the traffic center. These tickets were sold in lots of sixteen for \$1 and carried no transfer privileges whatever.

On Sept. 15, 1920, all free transfers were withdrawn, making the 10-cent cash fare good only to the traffic center. At the same time the reduced rate ticket was increased to fourteen for \$1 and new outer limits established at what was practically the former 6-cent city area. (See Brockton, Fig. 3.) On Dec. 1, 1920, the ticket limits were again extended to the limits of the 10-cent city zone. (See Fig. 4.)

Portland, Me.

In Portland, Me., prior to Aug. 1, 1918, the fare limits consisted of a number of 5-cent zones of various lengths with a number of overlaps. (See Portland, Fig. 1.)

On Aug. 2, 1918, the Portland Railroad, with the approval of the Maine Public Utilities Commission, established the initial zone system having a central area varying in radius from 3 to 4.5 miles from the central point of the city. Outside of this area was a series of zones varying in length from 1 to 3 miles. The fare in the central zone was 6 cents with free transfers except on three lines which operated entirely within the central zone and through the business or short-haul territory. On these the unit rate of fare was 5 cents with a 1 cent charge for a transfer. The rate of fare in the outside "copper" zones was 2 cents for short zones and 4 cents for zones about 2 miles in length with a minimum of 6 cents. (See Portland, Fig. 2.)

On March 2, 1919, the former inner zone was divided into three fare zones, making the unit rate of fare per zone 2 cents with tickets or 3 cents if paid in cash, with a minimum cash fare of 10 cents or 6 cents with tickets for three zones or less. Tickets were sold in lots of fifteen for 30 cents. Passengers paying cash were entitled to rebate checks equal to the difference between the cash fare and the ticket fare, which were redeemable at reasonably convenient points but not later than the close of the day following date of issue.

Effective June 15, 1919, without change in zone limits the 6 cents with ticket or 10 cents cash fares with rebate were changed to 7 cents with ticket and 9 cents cash without rebate. On Aug. 1, 1920, the rates were further increased to 8 cents with ticket or 10 cents cash.

Providence, R. I.

In Providence the Rhode Island Company on May 5, 1918, established a zone system with a 5-cent central area and with 2-cent mile zones outside. (See Providence, Fig. 2.) This zone system proved inadequate as a revenue producer and was difficult of collection inasmuch as it was necessary to use duplex or tear checks.)

On Oct. 23, 1918, the system was revised with 5-cent zones (see Providence, Fig. 3) and for collection purposes the Rooke register was again put into use. This plan proved to have a greater earning capacity and if it had not been that the increase in cost of service outstripped the gain in revenue this scheme would in all probability have been in effect today, but due to the need of greater revenues the fare in each zone was changed on Sept. 28, 1919, to 6 cents.

Springfield, Mass.

Another city that has tried a zone system with a central area is Springfield, Mass. Prior to May 1, 1918, a uniform fare of 5 cents with free transfers was in effect. (See Springfield, Fig. 1.)

On May 1, 1918, the first zone system was established. (See Springfield, Fig. 2.) Under this plan the unit rate of fare was 5 cents in the inner and first outer zone. The inner zone had an average radius of about 2.5 miles, while the distance across the first outside zone varied from 2 to 4.2 miles. There were two classes of reduced rate tickets: one, from any point in the Springfield inner zone to a point five miles out, sold in lots of six for 40 cents; the second was six tickets for 50 cents which were good between points in the inner and first outer zone. In the Westfield division outside of the Springfield city limits the rate of fare was 2 cents per mile, except in Westfield, where the minimum fare was 6 cents.

On Sept. 16, 1918, the cash fare in the two Springfield zones was increased to 6 cents. The six tickets for 40 cents were increased to 45 cents and the six tickets for 50 cents increased to seven for 65 cents. In the Westfield division the zone rate was increased to 2.5 cents per mile but no change was made in the zone locations or the minimum fare in Westfield.

On Oct. 19, 1919, the present rates of fare were established. This change made the fare 7 cents in each of the two Springfield zones. The former six for 45 cents tickets were increased to eleven for \$1 and the seven for 65 cents to nine for \$1.

In the Westfield division the mileage zone rate was increased to 3 cents with a 7-cent minimum fare or ten tickets for 65 cents. The mileage zones on the Palmer division were rearranged by making one zone out of each two adjacent zones and the rate of fare was increased to 7 cents per zone.

DETAILED DATA TO ACCOMPANY FLAT FARE CITY AREAS ON PAGE 16

CLEVELAND, OHIO Pop.—769,836* Area—46 sq.mi. Fare—6c., 9 tickets for 50c.	CHICAGO, ILL. Pop.—2,701,705. Area—182 sq.mi. Fare—Surface line 8c. flat. Elevated 10c., four tickets 35c.	BUFFALO, N. Y. Pop.—506,775. Area—38 sq.mi. Fare—7c., four tickets 25c.	DETROIT, MICH. Pop.—993,739. Area—58 sq.mi. Fare—6c., nine tickets 50c.
ST. LOUIS, Mo. Pop.—772,897. Area—56 sq.mi. Fare—7c. flat.	PHILADELPHIA, PA. Pop.—1,823,158. Area—91 sq.mi. Fare—7c., four tickets 25c. 3c. transfers at many points.	SAN FRANCISCO, CAL. Pop.—508,410. Area—40 sq.mi. Fare—5c. flat.	BALTIMORE, MD. Pop.—733,826. Area—50 sq.mi. Fare—7c. flat.
CINCINNATI, OHIO Pop.—401,247. Area—58 sq.mi. Fare—9c., six tickets 51c. Two tickets 17c.	*Population figures are from the 1920 census report.		WASHINGTON, D. C. Pop.—437,571. Area—48 sq.mi. Fare—8c., four tickets 30c.

Worcester, Mass.

The Worcester (Mass.) Consolidated Street Railway, operating in Worcester and vicinity, had prior to July 1, 1918, a central area 5-cent zone system with the suburban and interurban zones of varying lengths. (See Worcester, Fig. 1.) Many overlaps also were in effect both from urban points to interurban points and in the interurban zones.

On July 1, 1918, the rate of fare in all zones outside of the urban central zone was changed to 6 cents. On Aug. 1 of the same year the unit rate of fare in the Worcester urban area was also made 6 cents. The third change was made on April 18, 1919, when the unit rate of fare in each zone, city and interurban, was changed to 7 cents with ten tickets for 65 cents and 33½ per cent increase in all reduced rate tickets. No alteration in the length of zones was made in any of these fare changes.

On Nov. 30, 1919, the system was rezoned (see Worcester, Fig. 2) and the unit rate of fare reduced to 5 cents per zone, with a traffic center established at Worcester City Hall. All reduced rate tickets except pupils' tickets were abolished as well as free transfers in the Worcester urban territory.

On Jan. 4, 1920, the unit rate of fare within the Worcester city limits was increased from 5 to 6 cents, with no change in zone limits or rate of fare on outside lines. On March 7, 1920, a further increase to the present rates of fare was made. This made the unit rate of fare within Worcester city limits 7 cents per zone and 6 cents in the outside zones.

Public Service Railway, Newark, N. J.

Another example of a zone system tried and abandoned is that of the Public Service Railway of New Jersey. An even more drastic zone system was put into effect there (Sept. 14, 1919), as indicated by the accompanying analytical maps of Newark, which may be considered typical. The first of these shows the former and present flat fare areas. Before trying a zone system the Public Service Railway had first added a 1-cent transfer charge to the 5-cent fare and later changed to a 7-cent fare with a 1-cent transfer, which rate was lowered for a time to 6 cents and 1 cent for transfer, but almost immediately returned to 7 cents with 1-cent transfer.

The zone map shown there is not exactly correct, except when considered from the standpoint of the traffic center. This method of drawing the map was the only one practicable, however, for it does give some comparison with the other places where zone systems have been tried. In this case each line, no matter what its source or route, without relation to any traffic center, was laid off in equal length zones and a straight distance tariff put into effect. The charge per zone was 2 cents, except that the charge for the first zone was 3 cents; no transfers were issued, but "continuous trip" checks were issued in some cases. On Nov. 15, 1919, the so-called "five and one" plan proposed by the Public Utilities Commission superseded the "three and two" plan. Under the new plan the rates were 5 cents for the initial ride on any car, which, however, entitled the passenger to ride two zones or less, with 1 cent for each additional zone ridden. A charge of 1 cent was made for a transfer to obviate the necessity for a passenger to pay the initial 5 cents on the line to which he transferred. The system finally proved ineffective, however, for reasons hard to analyze. The complete story of this

and most of the other attempts being reviewed here have already been told by the ELECTRIC RAILWAY JOURNAL and will not be repeated except in review. Suffice it to say that the next step was to return (Dec. 7, 1919,) to the flat rate of fare, which is 7 cents, with a 1-cent transfer, the same that was in effect previous to the inauguration of the "three and two" system.

San Diego, Cal.

In San Diego a two-zone system with a 5-cent fare in each zone became effective on Jan. 1, 1920, superseding a 5-cent flat fare with free transfers. By this plan the city is divided into an inner and outer zone and the cash fare for a ride from the outer zone to any point in the inner zone or, in fact, across the inner zone to a point on the opposite side of the city in the outer zone, becomes 10 cents. Free transfer privileges are retained to connecting lines in either the inner or outer zones. Reduced rate tickets are sold in lots of four for 30 cents and monthly tickets good for purchaser only at the rate of 6.5 cents per ride. These tickets bear the same transfer privilege as cash fares.

From the review of fares, thus analyzed by the cities chosen, it appears that there is no known method of assessing fares upon the riding public that has not been tried in this national experiment. Some methods never heard of before have also been tried, as is evident.

Although it involves, possibly, a repetition of some statements earlier in this article, it should be pointed out that there is definite and conclusive showing that the managers of the various properties have done everything in their power to keep the cost of service to the car rider down absolutely to the lowest minimum possible; this in an effort not only to benefit the community by a low rate of fare but hopefully in regard to a continued use of the cars by low base rate. It should also be repeated that these fares have failed, at least in the earlier stages, to catch up with the increasing costs. This review also indicates, therefore, as was stated in another way earlier in the article, that the courageous and proper thing for the managements to have done would have been, early in the stage of increasing costs, to have placed the rate of fare at a high enough point to cover all these increases and to have recognized the fact that a declining number of passengers might be expected with radical increases in individual rates. Had this been done there is no question but that the industry would have benefited and the communities themselves would have been better served by thoroughly maintained properties, properties which would expand better to meet the needs of the communities than has been the case with this cautious effort to increase the revenues.

As to the future, he would indeed be an optimist who would predict the outcome. Some years ago the managers of properties might have been sufficiently optimistic to try this prediction, but in view of the past condition and the continuing need for increasing and ever increasing the gross income to meet payrolls, which are still advancing, no management would at the present time hazard an estimate of what the future may develop. It is doubtless true that costs will no longer advance and relatively few increases in rates from the present standard will be needed except such as are necessary to produce an income in excess of operating costs to meet the actual necessary return to the owners of the property.

It is also true that there is another aspect to this

problem in respect to future reduction in rates. Due to the history of the industry as related above there has been created a deficiency in earnings in all cases, and an actual inroad into capital in many others, which the various properties have suffered in the past six years. There has been an accumulated deficit and a decrease in maintenance which must be met and the property brought to a high standard of maintenance and credit before it will be possible seriously to consider any rate reduction whatever. That this fact is already recognized by the public as represented by the public service commissions has been indicated in the recent decision of the Public Utilities Commission of Tennessee on the application of the Nashville Gas & Heating Company for increased rates, decided Nov. 30, 1920.* In this case the commission found that the company had suffered a deficiency in earnings and an impairment of maintenance due to inadequate rates. It determined this deficiency in earnings to be \$118,000 and authorized the company to charge such rates as would be necessary to make the necessary return upon capital at present, which was set at from 6½ to 7½ per cent, and also to amortize this deficiency at the rate of \$1,000 per month. The company was further authorized and ordered to "reinforce its service in the outlying residential districts . . . with its first available earnings over and above the 6½ per cent on the investment and the amount hereinbefore set out with which to amortize its losses since July 1, 1919, and that the company shall not pay dividends on any of its stock until this work be completed." It appears that this attitude is an appreciation of one of the points which this article has intended to emphasize, namely, that the utilities, and certainly the electric railways, have conscientiously continued to give the best possible service to the public, generally at rates which have failed to pay the full cost, and that consequently there has accumulated a deficit which must be made up before the railways can again be of greatest service to the communities and certainly before it will be possible to consider rate reductions.

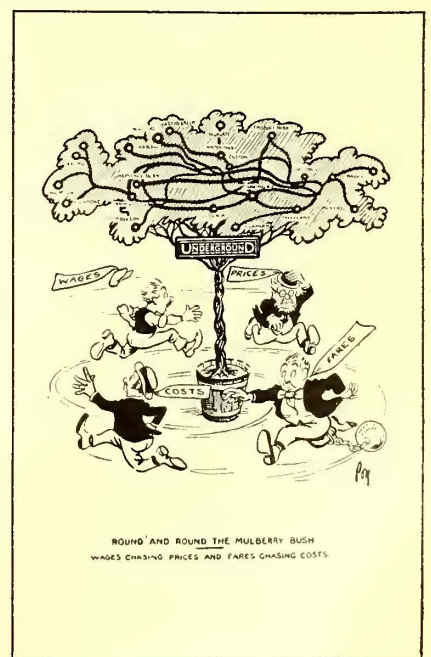
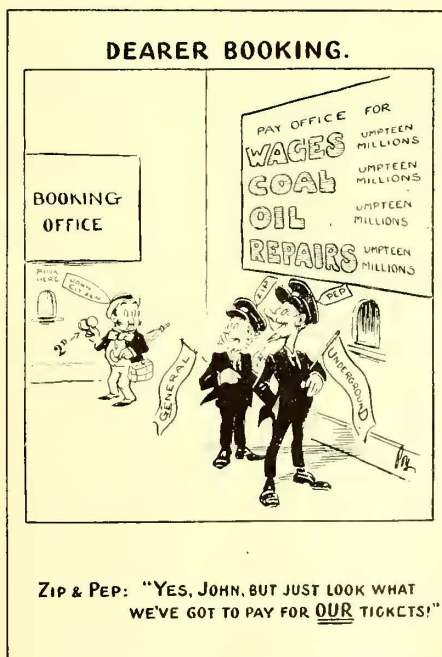
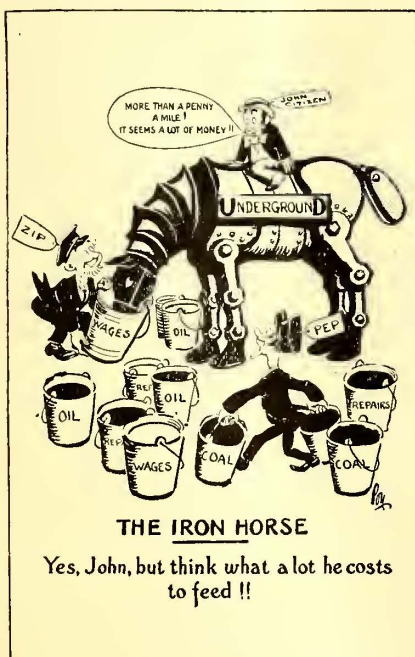
It is incumbent upon the managers of the industry to

*This decision is reviewed on page 63, this issue.—Eds.

impress upon the public the fact that undue caution has been the fundamental basis of all the rate advances in the past, and it is hoped that this contribution to the problem will assist in impressing upon the public the fact that none of the efforts to increase rates has at any time shown a sufficiently courageous attitude by the men charged with developing the service and sustaining the property and the corporation producing the service.

Another purpose of this article has been to show the experimental nature of the various fare changes that have taken place. It appears that this experiment has not ended. Where the industry is going as to fare systems and fare policies is also difficult to predict. It has been said that the trend is toward 10 cents. There is, of course, much to support this view, if a curve of fare changes is plotted, perhaps. But it appears that the industry can well consider the facts as they exist today. These facts, it appears, are that the public has been educated by the industry and by its own investigations into the matter to believe that costs of furnishing electric railway service differ in various cities in different parts of the country under the varying conditions which exist in these cities. Public opinion, density of population, riding habit, topography, living costs and the numerous other items which the industry has often talked of must be taken into consideration, and the public knows this. It is therefore very doubtful if any given fare, such as the former five cents, ever becomes so universally applicable as was that charge. Whether zone systems will prove practicable in the United States is not yet known. It is certain, however, that the final standardization of fare system for any community can be arrived at only after an intermediate period, during which the rate of fare shall be high enough to absorb the accumulated deficits of the past few years.

One conclusion which can be drawn from the experiment seems to be that the railways are in the habit of studying the matter in detail and that there is hope of arriving at a system of fares in America which will ultimately pay for the service, prove satisfactory to the riding public and allow the properties to grow to supply the transportation needs of the communities.



THE BRITISH ALSO HAVE HAD FARE TROUBLES
The London Underground thus tells the story to the public

When We Build Our Tracks

The Track Is the Vital Part of a Railway—Some of the Details Which Should Have Consideration in Connection with Track Construction Are Discussed—Some “Don’ts” Are Suggested for Study When Track Designs Are Being Prepared

By R. C. Cram

Engineer Surface Roadway Brooklyn Rapid Transit Company, Brooklyn, N. Y.

THE Federal Electric Railways Commission recently handed down a report emphasizing the fact that the electric railway is an essential utility which is and has been of great service in the development not only of the cities but also of the country as a whole. It is very desirable that the railways themselves shall fully realize the importance of the word “rail-way,” because we are apt to forget that the rail is an essential part of the track and that the track is the fundamental part of the railway. The Public Utilities Commission of Connecticut made the following pointed statement in a recent decision: “From an analysis of the history and development of street railways the commission is led to the conclusion that even though the motive power may change, as it has in the past, the essential features of a street *rail* way will remain. For more than seventy-five years street railways have operated along a predetermined course, on *rails* or *tracks*, with every new form of motive power.” (There is a temptation at this point to turn aside and comment upon the situation which has largely resulted from operation at a predetermined rate of fare since the fare question is behind most of our present track troubles.)

FIRST, WE MUST DECIDE WHETHER ALL OF OUR TRACK IS WORTH WHILE

No one except a jitney devotee will question the fact that the tracks are needed, but before we undertake to overcome the handicaps which have prevented adequate track reconstruction programs we should determine whether we really need all the trackage which we now have. There are many systems which are consolidations of lines which were formerly in competition and it has required a war condition to render evident the over-tracked state which may be found in numerous instances. Diminishing revenue revealed a number of situations where lines closely paralleling one another were not paying. They would have been seen not to have paid their keep if they had been operated as separate units instead of parts of a large system.

Consequently the beginning of the era of reconstruction and rehabilitation which is about to open should find us engaged in a study of our maps, population and riding statistics, and all the other aids incident to the process of reaching a decision as to what trackage should be definitely abandoned, sold as junk and written off the books. The tendency to hang on to unprofitable lines must first be overcome if we are to consider our industry as being subject to the same economic laws as those which control other industries. We should bear in mind that our paying obligations alone have reached such proportions that they may be large enough in some cases to turn a line from an asset into a liability. Incidentally a study should also be made of the gains which may be made by rerouting of lines which will naturally

follow any curtailment in track facilities. We have ample evidence that re-routing has often been a great aid in speeding up traffic and in increasing business.

TRACK WORK IS FIVE YEARS BEHIND SCHEDULE

It is everywhere apparent that the reconstruction and the rehabilitation of tracks have been held back by the general lack of adequate revenue which has prevailed during and since the war. Little new construction was going forward in the years immediately preceding the war and, aside from war trackage, very little new mileage has been built for several years past. It is needless here to state the causes for the lack of revenue, but the “no funds” condition always puts a stop to expansion of electric railway facilities and leads to radical curtailments in reconstruction and maintenance programs. With such conditions prevailing over a long period the way engineers have been forced to devote their efforts toward keeping up tracks which in normal times would be considered as fit only for the scrap pile.

In track work it has not been so much a question of the degree of maintenance, but rather one of any maintenance whatever. With labor at a premium; with material costs high and going higher, the problem has been that of finding the means to do the patch-plus-a-patch sort of work to which most systems have been reduced. When a reasonable amount of track is not reconstructed yearly the general standard of track condition lowers perceptibly, and second-hand rail and ties which might be used in further patch-work become as scarce as new materials. Some of us have even been forced to take up tracks to secure materials for repairs in other quarters.

Most electric railways are at least five years behind in their renewal or reconstruction programs, and tracks all over the country are in a general state of disrepair which is costly in rolling stock maintenance, in power consumption and in slow schedules. Fortunately there seems to be a rift in the clouds of financial depression which have so long hung over the industry and increased revenues have resulted from the fare increases granted by a reluctant or indifferent public. While a large part of these increases is consumed in increased pay-rolls and fuel costs, it seems that there should be some part of the added funds which can be devoted to the track and it should be remembered that the track is a vital part of the railway. Without the track, we cannot run cars. With poor track we cannot run cars safely and economically. If there be any money available, it is safe then to assume that a company will spend as much as possible this year upon the track and will start the work as soon as the frost is out of the ground rather than sometime after June 30. Let the calendar year begin to control the track expenditure as one means of lessening the cost of the work.

Perhaps the opportunity for an ideal rehabilitation

12645

such as Chicago developed in 1908 may not be present, but we can apply some of the Chicago methods of attack and adjust our plans to our present-day needs. With this in mind our first duty is to make a careful survey of the several types of track found on the system with the view of determining age, car traffic and general condition. From this we may make up a table or budget indicating where we should rebuild and where we should overhaul. The data in the table should be grouped to indicate the desirable order of work not only for the current year but also for several years in advance, as it will be almost impossible to overcome a five-year handicap within any one season. It goes without saying that such tables should also show estimated costs for each item, with group totals. Most estimates of this character are also required to show the division of the expense between the capital and maintenance accounts.

Another table or group of tables containing the same items of work but made to show the quantities of rails, ties, joints and paving materials will also be found very helpful in case the program should be adopted. It is usually unwise to make them up before the adoption of a program, since managements have a habit of changing and rearranging almost any schedule submitted.

In making studies for budgets of this sort it may be advisable to set aside some of our prevailing notions that we know all about our track systems and to make an analysis of the several types of track in service. Sketches should be made of these and designated by type numbers or letters. The percentage of each type in use should be determined. The tracks should be dug up in spots occasionally and the condition of the ties, rail bases and rail fastenings studied. An attempt should be made to compare the relative lives of the different types in the light of traffic conditions. Sometimes it may be found that older types of track are giving better service than some of the more modern types. Such a condition, if found, should be the basis for a search into the causes. Having determined upon the latter, the obvious step is to apply ourselves to the modifications in design which will remedy the conditions.

THINGS TO AVOID IN TRACK REHABILITATION

In connection with the preparation of track designs some "don'ts" may be in order. Do not play too hard at the game of "follow the leader." It is all very well to follow standards, but it does not always pay to assume that some particular track construction standard as developed on one system will be suitable on some other system. Do not forget that our association standards represent the best thought and a wide experience, and that they can be followed with assurance of their worth, if properly selected and correctly applied. Incidentally a study of the way committee reports on proper foundation for tracks in paved streets, to be found in the 1914 and 1915 Proceedings, will be of assistance in rounding up all the factors which should have attention when track designs are under discussion.

Do not expect to get something for nothing. We cannot afford to build too lightly in an effort at cheapness by reducing first cost. We must consider that a track should have a long life. A life of thirty years is quite possible, with modern rails and pavements, as an average. Such track cannot be built cheaply in these times but we should not try to stretch the available budget beyond the elastic limit of substantial construction. It is better to shorten the program a mile now than to

spend its cost in after years in excessive maintenance.

Do not design a track structure on the basis of a safety-car loading, unless satisfied that no other cars will every be run over it. No one knows whether the safety-car is here to stay, in its present light-weight form. Most properties still run much heavier cars and will continue to do so for years to come. The history of track construction reveals the fact that our early tracks were built too light. They were usually designed against loads produced by electrified horse-cars weighing about the same as our present safety cars. These tracks, and particularly the rails, did not withstand the ravages of corrosion, distortion due to undermining of track, increase in car weights and increase in operating schedules.

Do not forget that while track pavements are not strictly a part of the track structure the service which a track pavement will give is largely dependent upon the character of the track construction. The best pavement in the world will not overcome faulty track design and much of the criticism which is hurled at us today by civic authorities comes from defective track pavements.

GOOD PAVING IS A PAYING PROPOSITION

Efforts at lessening the track paving tax burden have been nullified very often by the paving conditions found in our tracks. Whether or not these are the result of improper selection of pavement, poor track, lack of funds or whatnot makes no difference to our critics. Hence our earnest efforts must be directed toward proving that good track pavements can be constructed and that such pavements are no more costly to maintain in tracks than elsewhere under equal traffic conditions. In this connection, the writer believes that much could be attained if arrangement were made to secure the co-operation of the American Society of Municipal Improvements with our own Engineering Association for the purpose of jointly studying paving materials and standards which would be mutually satisfactory.

If we are ever to get even a measure of relief from the paving burden, we must use our publicity to the utmost. It should be convincingly shown to the public that the costs for track pavements, when required by franchise, are really tax assessments. All legal opinion supports this view and we should let the people know that their fares must pay these taxes. One way of doing this is to let our investors know it also by changing our accounting methods so that pavement costs will be entered as "Taxes: Paving." These costs are now hidden away in Account No. 10 Paving, operating expense details.

From the paving at the top to the foundation at the bottom of the track is an inverse order in which to consider the track structure. However, there is little doubt that we have looked at the track too long from the top downward. So, another "don't" brings us to the track foundation where really we should have started.

Do not forget that the foundation of the track is the most important feature. The best of rails, ties and pavements may easily be ruined, or prevented from functioning properly, if the subsoil under the track has not received the attention it should have had when the designs were prepared. The soil upon which we lay our tracks should be studied just as carefully as though we intended to erect an office building upon it. It should be analyzed and the track foundation should be built with the view of not overloading the soil. Even in the same city, we often find sections where the soils are radically different and the ballast features of the track

design must be changed accordingly. Drainage plays a big part in the treatment of subsoils and the neglect to provide it has caused more track and pavement failures than any other agency. Surface drainage is an item which should receive consideration. The installation of track drains aids in overcoming underdrainage troubles by preventing infiltration of surface water.

THE SUBSOIL SHOULD NOT BE OVERLOOKED

The character of the subsoil and the treatment required to render it stable, will be a determining factor in settling the question of the need for ballast. The subsoil may be very stable and of a self-draining nature, in which case the placing of ballast of stone or concrete may be unnecessary, but statistics have shown that fully 90 per cent of the mileage of tracks in streets is now ballasted with crushed stone or gravel predominating.

The kind of ties and general form of the track superstructure will also have an influence upon the ballast question. If some form of steel tie structure is to be used, the ballast will necessarily take the form of concrete. The writer has observed that the tendency in the past has been to skimp on the amount of concrete used in such cases and when the Carnegie type of steel tie was used, the ties were spaced too widely. In using such construction recently it was found advisable to space the ties 3 ft. on centers and to place 6 in. of concrete under them with no change in level of the concrete between the ties. Before the concrete was laid on the unstable soil found in this case, it was necessary to roll broken concrete and asphalt into the trench to a depth of 4 in. Five years' service has disclosed no track troubles of moment with this construction. Some of our earlier uses of these ties had disclosed the need for more concrete and closer tie spacing. Similarly, the use of other forms of steel ties should have careful study so that we may be sure we are not building too light. We must not expect either the tie or the concrete to do work beyond its capacity.

Meanwhile, the wood tie is not going out of date, even if its price has increased. The adherence to its use is partly due to the uncertainty of the performance of substitute tie construction. It is also due to the fact that most of us know how to lay wood-tie track and we also know that good wood ties will last indefinitely in well-drained, well-paved tracks. It is also much easier to get good track built under traffic with wood ties, and many of us cannot put track out of service long enough to cure concrete as it should be cured when it is used for the track structure itself.

WIDE RANGE OF STANDARD RAILS AVAILABLE

In selecting rails, the effort should be made to use association standard rails to the fullest extent. There are now nine standard rails available. These are 80, 90 and 100-lb. standard section (80-lb. A. S. C. E. and 90 and 100-lb. A. R. A. "A") rails; 7-in. and 9-in. girder grooved; 7-in. and 9-in. girder guards to match; and two plain girder rails, 7-in. 80-lb. and 7-in. 91-lb. These nine rails should give the widest range of selection to suit almost any condition. It may be noted here that the writer believes that the 7-in. depth of rail is the predominating one used for tangent tracks and the 9-in. depth is being relegated to the obsolete class. With the passing of the old-style 8-in. granite paving block and the betterment of rail joints, the arguments formerly applied to bolster up the use of the 9-in. rail have fallen rather flat. Chicago continues with it because ordi-

nances stipulate that it shall be used. Philadelphia probably sticks to it because old-style, deep granite paving blocks are still found there in abundance. Furthermore, the saving in weight in favor of the 7-in. rail can be applied toward increasing the amount of track obtained for a given tonnage.

In regard to joints, so much has been said about the tendency towards the use of the welded joint of some kind that it is hardly necessary to call attention to its increasing use. It is believed that some form of welded joint is an essential to first-class permanent track construction in paved streets.

Track pavement selection is seldom within the sole province of the railway company. City engineers have their say, and the railways usually have to install whatever pavement the city deems expedient. Many companies have been forced to install unsuitable track pavements for this reason and to take the blame for their poor condition as well. Such conditions call for greater efforts toward co-operation with city engineers for the purpose of securing pavements which are mutually satisfactory. The principal two questions to be decided in connection with track pavements are: (1) Is the track suitable to receive the pavement, and (2) is the pavement one suited to the track and street traffic.

LABOR-SAVING DEVICES NEED FURTHER DEVELOPMENT

The intensive use of tools and machinery designed to save labor should be continued and even extended in quarters where we have thought that machinery which would replace manual labor could not be devised. The track construction and reconstruction task has proved a fertile field for the installation of machinery, and surprising results have been attained in keeping costs down despite the rising labor costs.

There are a few features of track work which have withstood efforts to introduce mechanical in place of manual methods. The difficulties which now seem to prevent further progress in "doing it mechanically" should be the object of renewed attack and the writer believes that we will see notable developments along such lines during the next year or two. Meanwhile, our manual methods may need overhauling and a careful study of methods of doing particular parts of the work will often disclose exceptional savings which can be made through what appear to be slight changes in details.

There has been some tendency toward a relaxation in the rigidity of our specifications for materials. We have often been forced to accept inferior quality in order to keep work going. This may have led us to consider that the inferior article is good enough; especially when the price of inferior articles has been higher than the price of the best ought to be.

It is now time to take up the matter of material specifications with a view to a speedy return to a more rigid adherence to their requirements. So with the minor tools used in trackwork, we should realize more than ever that tools of poor quality are wasteful of very costly labor. Track chisels, picks and bars should be made of the most durable material obtainable. Shovels of extremely long wearing material are now available and present labor costs warrant their use more than ever. It now costs about \$5.50 per day to work a shovel, whether the latter costs one dollar or two.

Moreover, having secured good tools, we should use every precaution to see that they are properly used and that they are kept in a good state of repair.

Outlook for Service-at-Cost Franchises

By *L. R. Nash*

Public Relations Manager Stone & Webster, Inc.,
Boston, Mass.

TWO years ago the *ELECTRIC RAILWAY JOURNAL* gave to its readers an outline of the origin and development of service-at-cost franchises in the electric railway field. During the two years since passed there have been noteworthy additions to the list of service-at-cost cities and there is a substantial number of other cities in which service at cost is under consideration. On the other hand, experiences with earlier franchises of this form have developed certain shortcomings and criticisms which have in part been responsible for the rejection of the service-at-cost plan in several cases. All these facts should be fairly faced and analyzed before unqualified approval can be extended to this method of settling the complicated and pressing financial problems which have become particularly acute in the past two years of electric railway history.

During this period the Federal Electric Railways Commission made an exhaustive study of the electric railway situation and presented a report to the President recommending service at cost as one of the most promising steps to be taken. This recommendation, made after a most thorough investigation of this particular phase of the subject, is entitled to very great weight, and indicates that, in the judgment of this commission, any defects so far observed are not insurmountable.

It is the purpose of this article briefly to summarize the significant features of the new service-at-cost grants which have become effective, those which are under discussion and those which have failed of adoption, with particular reference to the reasons for the failures. Reference will also be made to certain criticisms of the service-at-cost program—all to the end that the advantages, disadvantages and practicable modifications of this method of operation may be clearly comprehended and our future activities in this direction shaped accordingly.

Effective New Franchises

YOUNGSTOWN

This franchise, which became effective in January, 1919, runs for a term of twenty-five years. In order to remain in full effect it must be extended at intervals of ten years. In general it is patterned after the Cleveland grant, having allowances on a car-mile basis for operating expense and for maintenance, repairs and renewals. In this respect it has departed from recent practice which has come to look upon such allowances as cumbersome and as having few practical advantages.

The franchise provides for a commissioner to super-

THE AUTHOR gives an extended review of the service-at-cost franchises adopted during the past two years, as well as those rejected and the changes made in those modified during this period. He concludes with a discussion of the arguments against this form of franchise. For the most part, these center about the question of incentive for economical operation, and Mr. Nash finds most recent service-at-cost franchises include such a clause. In conclusion he cites such a provision in a rejected franchise which aimed to overcome objections raised to the usual form of this clause. The article is a supplement to the exhaustive one from Mr. Nash in the issue of Jan. 4, 1919.

vised street railway operations and act as adviser to the City Council, which retains general jurisdiction over important proceedings including regulation of service, ordering of extensions, financing, etc. With respect to capital value and the return thereon, the program departs somewhat from the Cleveland standard in that it allows a fixed return of 7 per cent upon an initial capital value of \$3,900,000, plus working capital and the fare stabilizing fund, but adds the actual interest and dividend requirements upon secu-

rities sold for additions and improvements, all of which are issued under the specific direction and approval of the city and added to capital value at par whether or not sold at that price.

Extensions and improvements to the property are handled in the conventional way, with the limitation that no expenditures for such purposes can be required by the city when they will impair the present or future ability of the property to earn the authorized return, or if required financing is impracticable.

The balance of the company's revenues, after operating and up-keep allowances are deducted, is deposited in a fare stabilizing fund, from which taxes and the return on the investment are withdrawn. For the purposes of fare regulation the lower and upper limits of this fund are placed at \$50,000 and \$150,000, respectively, these limits acting as automatic indicators of the requirement for increased or decreased fare. The conventional program of fare steps is provided, ranging from 3 cents to 9 cents cash, with 1 cent additional for transfers in all cases and with reductions for tickets purchased in quantities. When either end of the initial schedule of fare steps is approached, additional steps are provided for, consistent in their effects upon revenues with the steps initially established.

The city is given the right to purchase at any time on six months' notice, the purchase price being the then capital value with the usual adjustments for reserves, current assets, liabilities, etc. As the Youngstown street railway system is a part of the property of the Mahoning & Shenango Railway & Light Company, doing also a lighting business in Youngstown and railway and lighting business in other localities, it was the desire of the city that the property affected by this franchise be separated from the balance of the system if the necessary corporate arrangements could be effected. To this end the city purchase terms provide that, if a new railway company is promptly organized to take over the property affected by this franchise, the price at the time of purchase should be increased to 10 per cent in excess of that otherwise due.

In order to secure stability both of investment and service, which could not be assured if the franchise approached termination without plans for future operation, the stipulation is set up that when the unexpired life of the grant or any renewal thereof is less than fifteen years the company may amortize its entire capital value during the remaining period of the grant on a 7 per cent sinking fund basis and increase its fares to take care of the amortization requirements. If at any time during this remaining period the city should see fit to grant a renewal, the accumulation in the amortization fund may be used for extensions and improvements or to retire outstanding securities. During any amortization period the company is not required to extend its property, but may do so upon its own responsibility.

The grant contains a novel provision with respect to penalties for violation of requirements under the franchise as interpreted by an arbitration board. If the company refuses to abide by an arbitration decision, the arbitration board may, as in the case of the Cleveland grant, reduce the authorized return on the capital value by an amount not exceeding 1 per cent. Offsetting this there is the added provision that, if the city fails to carry out any arbitration requirements, the return to the company may be increased upon the order of the arbitration board by not more than 1 per cent. The grant contains the usual arbitration clause covering the settlement of a wide range of disputes, and also continues the obligation of paving repairs and renewals contained in prior franchises, which obligation has been curtailed or omitted in a number of recent franchises of this form.

Operations under this grant began with a cash fare of 5 cents, plus 1 cent for transfers, an operating allowance of 22 cents per motor car-mile and a corresponding maintenance and renewal allowance of 8 cents per car-mile. Under the operations of the franchise, fares and allowances have already been repeatedly increased to take care of increasing operating costs.

MEMPHIS

Effective April 1, 1920, the Memphis Street Railway began operations under a service-at-cost plan embodying features not theretofore employed. The program involves no change in the company's franchise, but, in response to the company's application to the Public Utilities Commission for an increase in fares, the commission, after determining the value of the company's property, prescribed a service-at-cost plan of operation under its own supervision instead of the usual local control, to the end that the company might always render service satisfactory to the city with fares automatically adjusted to the cost of such service without recurrent formal appearances before the commission.

The commission established the conventional fare index fund with lower and upper limits of \$60,000 and \$200,000, respectively, and a schedule of fares ranging from 5 cents to 8 cents with $\frac{1}{2}$ -cent steps, the range to be extended when either upper or lower limit has been approached. Except in emergencies, fares are to be changed only on any Jan. 1 and July 1, if the fare stabilizing fund has reached either the upper or lower limit and has moved toward such limit during two preceding months.

The cost of service includes a $7\frac{1}{2}$ per cent return upon the established value of the property unless the fare

index fund is thereby reduced below the lower limit, in which case the return may be reduced to not less than $6\frac{1}{2}$ per cent. If the fund is exhausted at any time, money for the minimum return or other purposes may be borrowed, to be later made up with interest from increased revenues.

The commission established a flexible provision for depreciation annuity, under which the normal annual appropriation is 3 per cent of the property value. If, however, the accumulated reserve exceeds \$500,000, the annuity is reduced to 2 per cent; if the accumulated reserve falls below \$300,000, the annuity is increased to 4 per cent.

Another unusual feature is the setting up of a standard of service, determined by the commission, adequately to take care of local requirements. This standard is expressed in car-miles per revenue passenger, the upper and lower limits being fixed at 0.185 and 0.155 respectively.

In establishing a value for the Memphis railway property the commission was liberal in its recognition of development cost, cost of financing and other overhead charges often given scant consideration, so that, while the percentage of authorized return is not as liberal as appears in some recent settlements, the dollars available for investors are not unreasonably low.

In its administration of operations in Memphis the Utilities Commission has recently found it expedient to appoint a local agent. This agent performs substantially the functions of the supervisor, appointed under most service-at-cost grants as the representative of the city.

ROCHESTER

A new franchise was granted to the Rochester lines of the New York State Railways, effective Aug. 1, 1920, for a term of ten years, with provisions for renewal after the expiration of nine years. Supervision of operations under this franchise is in the hands of a Commissioner of Railways, who has exceptional authority in all matters having to do with the service or property. He is limited with respect to extensions that may be ordered because of the short life of the grant, which states in dollars the limits by years permitted after the first five years.

The usual fare stabilizing fund is provided with lower and upper limits of \$200,000 and \$500,000, respectively. The automatic fare schedule also contains the usual steps, the initial rate being 7 cents cash, $6\frac{1}{2}$ cents tickets. The rate of return varies with the rate of fare, being 6 per cent for a cash fare of 7 cents or more, and grading upward to 8 per cent, if a 3-cent cash fare should ever be reached.

If it is necessary to borrow money at an actual cost in excess of the base allowance of 6 per cent, the excess over this rate is charged as an operating expense.

Accruals for depreciation are at the rate of 2 per cent per annum on the capital value, but the accumulated reserve is limited to \$600,000.

Arbitration is provided for, and each party to the agreement bears one-half the cost of arbitration proceedings from its own funds.

The company reserves to itself exclusive control over its corporate affairs, selection of officers, employees, etc., and is authorized to arrange "supplemental transportation" if it appears in the interests of the city. One-man cars are also specifically permitted. No provision is

made for city purchase. The initial capital value was temporarily placed at \$17,500,000, but is later to be determined by agreement or arbitration.

TOLEDO

After many years of bitter controversy over the street railway situation in Toledo, the city and the Toledo Railways & Light Company have finally agreed upon operation under a service-at-cost grant which now awaits only the formal acceptance of the company before going into effect. The same problem of separating railway property and operations from other activities of the company arose as in the case of Youngstown and was solved in Toledo by the organization of the Community Traction Company, which will be a subsidiary of the present combined company.

The grant provides for transportation service by rail "or otherwise" for a term of twenty-five years, with renewal, lease and purchase features. The general responsibility for operations rests with the City Council, although the grant provides for a Board of Control of three members appointed by the Mayor, to act without compensation, as advisers to the City Council and to the commissioner. The commissioner has immediate charge of the street railway service and acts as technical adviser to the Board of Control and the City Council. The city also has at least one member on the traction company's board of directors, but if the common stock of the company owned by the city bears a sufficient proportion to the total capital value, the city's representation on the board may be increased. The company votes the issued common stock until it has been acquired by the city.

The capitalization scheme of the newly organized Community Traction Company is of interest. Initially it will issue \$8,000,000 of bonds covering existing railway property, plus \$2,000,000 of preferred stock to provide working capital, a fare stabilizing fund and funds for rehabilitating and rearranging the existing property. There is provided in addition \$10,000,000 par value of common stock, all to be initially held in trust, but ultimately to be acquired, in part at least, by the city under conditions later described. The capital value for rate purposes includes only the initial bonds and preferred stock and such additions thereto as are necessary to take care of extensions and improvements to the property. It is intended that through future financing the preferred stock issue shall be increased to not less than 40 per cent nor more than 60 per cent of the capital value.

The cost of service, as defined by the franchise, includes expenses of operation; an accrual to be determined by the Street Railway Commissioner for maintenance, repairs and renewals, the amount not necessarily being uniform from year to year or from month to month; taxes and public charges of all kinds, including income taxes and interest on floating debt; a depreciation annuity of not less than one-half of 1 per cent nor more than 1½ per cent of the capital, with an accumulated reserve of less than 4 per cent of the capital value; a sinking fund of 2½ per cent of the capital value, but not accumulating to more than 20 per cent, and return to investors, including interest at 6 per cent on the bonded indebtedness and dividends at 8 per cent on the preferred stock.

All the above items of cost are cumulative. With the exception of interest and dividends, they are taken directly from operating revenues. Monthly balances are

deposited in the fare stabilizing fund, from which returns to investors only are taken. The fare stabilizing fund has lower and upper limits of \$300,000 and \$500,000 initially, but ultimately they will become 3 per cent and 5 per cent, respectively, of the capital value.

The original fare schedule contains fourteen steps lying between 5 cents and 7 cents cash, with reduced ticket rates and a 1-cent charge for transfers under all rates. This schedule may be extended up and down without limit to meet wider ranges in cost than provided for by the original steps. The initial cash fare will be 6 cents.

The City Council, the Board of Control or the company may propose extensions which the company is required to make if the necessary financing can be reasonably accomplished and the present or future ability of the company to earn the authorized income is not thereby impaired. Where new property elements take the place of old, only the excess cost of the new elements over the cost of the old elements at the time of the replacement is added to capital value. By this arrangement the capital value is not increased in connection with replacements by any increase in general price levels.

The 2½ per cent sinking fund included in the cost of service is used to retire outstanding bonds up to 20 per cent of the total capital value. As these bonds are retired an equal par value of common stock is released to the city, but without any corresponding reduction in capital value. To that extent the city has an increasing ownership in the property, but limited to 20 per cent, except for amortization features referred to below.

The city may, on six months' notice, purchase the property of the company at any time at the then capital value plus premiums on outstanding bonds (4 per cent) and preferred stock (8 per cent), less common stock issued to the city, and with the usual adjustments for reserves, etc.

The city may also, after a favorable referendum vote, lease and operate the property of the company, paying all taxes and public charges and 8 per cent return upon the entire capital value less bonds and preferred stock retired. The city must also, under such lease, accrue 4 per cent of the capital value in place of the prescribed bond sinking fund for amortization purposes. When, under such lease, the city has retired not only the remaining outstanding bonds but also the entire preferred stock, it may take over the property without further capital payments. The city may also elect, when the salvage value of the property only remains in outstanding securities, to continue the lease indefinitely by extending the franchise from time to time and paying into the amortization fund only such amounts as are necessary to bring new property elements down to their salvage value.

The company, under such lease, may build extensions to the property, but it is not required to do so. If the city terminates a lease at any time and returns the property to the company there must be a franchise extension if necessary to give the company a ten-year period of operation, in which it may amortize all remaining outstanding securities, charging the necessary higher fare for that purpose. At the end of such period the property reverts to the city without payment other than adjustments.

If the city elects neither to lease nor to purchase, and the franchise term comes to less than fifteen years'

balance, the company is authorized to increase its fares sufficiently to amortize the outstanding securities uniformly during the period. Additions which the company may make to the property during this period with the approval of the city may be amortized during the balance of the grant, but no such additions shall be required.

When, at the final expiration of the grant, all securities outstanding have been retired, the system becomes the property of the city. If an offer of renewal or extension of the franchise is rejected by the company the privilege of amortization does not apply until fifteen years from the end of the extension offered.

It will be recalled that Toledo has made various unsuccessful efforts to purchase the local railway property, but has encountered insuperable obstacles. It should be pointed out that the present franchise provides not for service at cost but service at cost plus an installment of the purchase price of the property, and so the car riders under the operation of this grant will necessarily pay a part of the cost of service belonging to future years. If the desire for municipal ownership should disappear under peaceful and satisfactory operations under this franchise, and extensions thereof, rather than purchase or lease should be made, the city's interest in the property would be limited to 20 per cent and the amortization burden of the present generation of car riders would not be serious. Under the lease provisions or in case of failure to renew the grant, however, the cost of service might increase to a burdensome extent. Other than for this feature of the franchise, it holds promise of a successful solution of long-standing difficulties.

PADUCAH

The reference to service-at-cost settlements effected during the past two years would not be complete without mention of a franchise involving some service-at-cost features which became effective in Paducah, Ky., on Oct. 1, 1919. In negotiating this franchise it was found expedient to avoid many of the complications contained in the usual service-at-cost grants if reasonably satisfactory adjustments of fares could otherwise be secured. The new franchise, therefore, simply provides for annual adjustments of fares to meet existing cost of service, as shown by the experiences of the preceding year, but without definitely determining a fixed value of the property or the return which should be allowed thereon.

Rejected Franchises

Attention should now be directed to certain service-at-cost plans of operation which have been drafted in substantially complete form by agreement between interests representing the cities and their street railways, but which have finally been rejected. These rejected agreements are referred to because they embody features which may be of interest or assistance in connection with future drafts of this kind.

DENVER

Early in the war period the Denver Tramway Company found itself in need of additional revenue which was not adequately provided after recourse to various public authorities. A committee of representative citizens was finally appointed to investigate the situation and report to the Mayor as to the best solution of the

difficulties. This committee, after thorough and impartial investigation, reported that a service-at-cost plan of operation under the existing franchise was desirable. An agreement of this kind was accordingly prepared embodying service-at-cost features not radically different from those recently encountered, among which the following may be mentioned:

Supervision is lodged in a Board of Control consisting of three members, two representing the city and county of Denver and one the company. The normal rate of return allowed (after a preliminary lower rate) is 7 per cent, with a graded bonus for efficient operation, fixed by the rate of fare in effect. The maximum bonus is 1 per cent, applying only when the fare is less than 5 cents; at 5 cents the bonus is three-quarters of 1 per cent; at 6 cents, one-quarter of 1 per cent, and at higher fares, nothing. Accruals for depreciation were fixed at \$450,000 per annum instead of the usual percentage on the property value. The fare stabilizing fund has lower and upper limits of \$100,000 and \$500,000, respectively, with an unlimited schedule of fares in half-cent steps, with free transfers.

The company is freed from franchise taxes, bridge rentals and paving costs and repairs. The original recommendation of the committee that no free transportation of any kind be granted was not embodied in the franchise. The conventional arrangements for arbitration and city purchase were also included.

This agreement, together with another simpler one for fare regulation proposed as an alternative, was rejected by referendum vote in October, 1919, by the very narrow margin of 235 votes out of a possible voting list of nearly 100,000. The rejection was apparently based not on the program itself, although the valuation agreed upon was criticised, but upon any rearrangement which would not place some restrictions upon fares.

MINNEAPOLIS

Early in 1919 a service-at-cost plan of operation was drafted for the City Council of Minneapolis as a solution of existing fare deficiencies. The program was approved by the Council, but was strongly opposed by the Mayor, and was finally defeated by referendum in December, 1919.

The general program does not depart substantially from the usual provisions of such grants. The authorized rate of return upon a \$24,000,000 value was 7 per cent, the return on additions to be at cost plus 1 per cent, unless the city should undertake to guarantee this cost rate. The allowance for maintenance, repairs and renewals was 2½ per cent of the capital value, plus 9 per cent of the annual revenue. The fare stabilizing fund had lower and upper limits of \$150,000 and \$500,000, respectively, and the schedule of fares showed the unusually large difference of 1 cent between steps. City purchase at the capital value and purchase by a licensee at a 10 per cent higher amount were included. The requirements for paving, cleaning, watering and oiling of streets could be waived by the city if excessive fares resulted therefrom.

ST. PAUL

The Twin City Rapid Transit Company had the same difficulties with an inadequate revenue in St. Paul as in Minneapolis and undertook negotiations to remedy the situation at about the same time. A service-at-cost

draft was presented by the company to the city embodying provisions not radically different from those recommended in Minneapolis. This proposition was never accepted by the City Council, which, on the contrary, proposed a regulatory program wholly unsatisfactory to the company. Obviously the two main divisions of the Twin City system could not be operated under substantially different fare and service regulations without embarrassing complications, and these were considered in St. Paul after the rejection of the Minneapolis program.

HOUSTON

After exhausting other efforts to secure increased fares, the Houston Electric Company early in 1920 secured an injunction through the federal court against a 5-cent fare ordinance. In connection with the court proceedings, the value of the property was determined as well as the fair return and allowances for depreciation. These matters having been established, the city and the company undertook to agree upon a new franchise on a service-at-cost basis which would settle future fare and service problems. The final agreement between city officials and company officials, which also had the approval of an advisory board of citizens, was embodied in a franchise draft which the City Commission voted to submit to referendum without prior passage or indorsement. The indorsement was withheld because some opposition developed among the city officials to a few provisions of the draft, including the specified rate of return. The company felt that complete co-operation was necessary for the successful functioning of the proposed settlement, and, because of the lack of unanimous support, it requested that the draft be withdrawn from referendum until such time as complete co-operation might be secured.

The service-at-cost draft, as agreed upon, embodied some interesting features. It covered service by street railway or "other method of transportation." The Board of Control, which was to have jurisdiction over operations under the franchise, was composed of four regular members, two appointed by the city (one of whom must be the Mayor) and two appointed by the company. If these four were unable to agree upon procedure in any matter, a fifth member was selected to sit and decide with respect to this particular matter.

A return of 8 per cent upon the capital value was stipulated for at least seven years of the thirty-year term. A supplementary return was provided as an incentive for efficient operation not exceeding 1 per cent, which was authorized when a 5-cent fare became effective. The highest fare at which the incentive applied was 7 cents cash when the incentive was one-fifth of 1 per cent.

The fare regulating fund had a normal initial amount of \$250,000, to be increased from time to time with the development of the property and its business. The maximum and minimum amounts of this fund—the points at which changes are automatically required—were 40 per cent above and 40 per cent below the normal, respectively. Changes in the fare were to be made quarterly when the fare regulating fund indicated the necessity.

The depreciation accruals were intended to accumulate by annuities not exceeding 4½ per cent of the depreciable property value, a total reserve lying between 8 and 10 per cent of such value.

Franchises Under Consideration

In addition to the above cities in which definite steps have been taken to bring about service-at-cost operation, a number of other cities have given the subject considerable attention as a solution of problems resulting from inadequate fares and service. In some cases this solution has been rejected, while in others it is still under investigation. A brief mention only of these cities, with the significant developments, is permissible herein.

INDIANAPOLIS

Early in 1920 the Indiana Public Service Commission, at the request of the city, undertook to draft a service-at-cost plan to solve fare difficulties. This general plan was approved by the company, but, after extended negotiations, the city recently withdrew its application to the Public Service Commission to settle the matter on this basis because of a feeling that, due to its lack of an incentive for efficient operation, the conventional service-at-cost program did not offer a satisfactory solution.

BUFFALO

In 1919 this city undertook to settle its controversy with the International Railway Company by a service-at-cost plan. Enabling legislation agreed upon between the city and the company was, however, vetoed by the Governor, following a protest from the Public Service Commission. The Mayor of Buffalo not long ago revived his interest in this form of settlement, but nothing has so far been accomplished.

DETROIT

Detroit, in 1919, after years of controversy quite similar to those which Cleveland and Toledo have experienced, received from its Board of Street Railway Commissioners a report recommending service-at-cost operation. Although this report was indorsed by the business interests of the city, it was strenuously opposed by the Mayor, and ultimately rejected by the city in favor of a municipal ownership program.

LIMA

During the past year service-at-cost has been proposed for the lines of the Ohio Electric Railway in Lima. The proposition was opposed by a citizens' committee, and no action has yet been taken thereon by the City Council.

NEW ORLEANS

The receiver of the New Orleans Railway & Light Company recently proposed a program of this form for settling the fare and wage controversies which have been pressing in New Orleans. This suggestion was indorsed by special masters who served in a wage controversy, but no definite action has resulted.

SYRACUSE

The New York State Railways proposed service-at-cost for its lines in Syracuse similar to the plan adopted for the part of its system located in Rochester. A valuation of the property was made by a committee, but the whole program was finally rejected by the City Council in November, 1920, apparently because of the higher fares which would probably be necessary thereunder, it being alleged that the proposed valuation was excessive.

LOUISVILLE

The officials of the Louisville (Ky.) Traction Company suggested in July, 1920, that its inadequate fares be taken care of automatically under a service-at-cost agreement. The City Council rejected the suggestion, but the matter has recently been reopened by the Mayor.

PITTSBURGH

In 1919 a report on the value of the railway property in Pittsburgh (Pa.) was made by a joint board, and the proposition that a service-at-cost agreement be entered into was indorsed by the Allied Board of Trade. Following this action, the Mayor, in April 1920, proposed negotiations looking to such a settlement, but definite results are still lacking.

AKRON

More favorable developments are in prospect for the lines of the Northern Ohio Traction & Light Company operating in Akron. The general terms of a service-at-cost settlement have been informally agreed upon between the City Council and the company. The tentative agreement provides for a return of 7 per cent when fares are 6 cents or higher, and a supplementary return of one-quarter of 1 per cent for each step in the fare schedule lower than 6 cents, the steps being $\frac{1}{2}$ cent each. An additional return is allowed to take care of any higher actual cost of future borrowed funds. A sinking fund is provided to amortize the capital value if the franchise comes to within ten years of expiration without being renewed. The city waives its right to assessments for new paving, although the company undertakes to keep existing paving in repair. If extensions to the system are needed and the company is unable to procure the necessary funds the city may finance them and get the same return thereon as is allowed to the company. The company is authorized to operate an auxiliary bus service if it appears to be a desirable substitute for track extensions into outlying territory. The city may purchase or lease upon a year's notice.

NORFOLK

In 1919 service-at-cost was proposed for the railway lines in Norfolk (Va.) by the City Manager, and the city has gone on record as favoring liberal treatment of all industries which are located therein. No definite action with reference to the railway has been taken, although a recent report of the consulting engineers retained by the city to investigate the local situation strongly advises a settlement embodying service-at-cost features. The matter will doubtless have further attention in the near future.

GRAND RAPIDS

The franchise of the railway lines in Grand Rapids (Mich.) expires in 1921. A valuation of the property is now being made and the draft of a new franchise containing service-at-cost features is in progress.

ST. JOHN

An interesting plan for the operation of the public utilities in St. John (N. B.), including the street railway, was proposed in 1919 by a special commission appointed by the Lieutenant-Governor in Council. Under the proposed plan a basic return of 7 per cent is suggested, this rate to be increased by 0.1 per cent for each 1 per cent, by which the average rate is reduced below

that existing in the first six months of 1919, and the basic return may be reduced similarly for any necessary increases in rates, but not below 6 per cent, nor are increases effective above 9 per cent. The rate of return is to be adjusted semi-annually. Control of the company's affairs is to be vested in seven directors, four chosen by the company and three appointed by the Lieutenant-Governor in Council. Sale to the province is provided for at the capital value plus 10 per cent. The proposed depreciation provision is such as to accumulate and maintain a reserve amounting to 7 per cent of the capital value. No action on the proposed agreement has been reported.

NEW YORK

In his latest annual report to the Legislature of New York, Commissioner Nixon of the First District recommended the adoption of service at cost as the best solution of the acute traction problems of the New York city systems. An unsuccessful attempt was also made in 1920 to pass legislation in New York permitting any city to adopt service at cost for its local railway system.

Old Franchises Amended

In addition to the new and proposed service-at-cost franchises above outlined, it may be of passing interest to note changes which have been made in certain of the older grants that have previously been fully described.

CLEVELAND

On May 1, 1919, the Cleveland franchise was extended for a period of ten years, making its expiration date 1944 instead of 1934. This was in accordance with the original provisions of the grant under which, without such extension, the powers of regulation vested in the city would have been suspended. In 1919, also, the railway called for arbitration proceedings in an endeavor to increase the authorized rate of return from 6 per cent to 7 per cent. This increase was approved by the arbitration board, but failed of ratification by referendum vote and has not become effective.

DALLAS

In 1919 the Dallas (Tex.) franchise, of the service-at-cost form with a maximum fare limitation, was found to be yielding wholly inadequate revenues. Upon presentation of the facts to the City Commission the fare limitation was increased in 1920 from 5 cents to 6 cents. It is now being contended by the company that this limitation should be removed, as the actual cost of service is approaching 8 cents. The city so far has not shown any disposition wholly to remove the present limitation.

KANSAS CITY

Operation in Kansas City (Mo.) under a franchise providing for division of possible profits with a 5-cent fare instead of service at actual cost proved so unsuccessful under war emergency conditions that the fare limitations were removed by order of the Public Service Commission. In spite of this relief the company has been placed in the hands of receivers. The local Chamber of Commerce has undertaken an investigation of the situation with a view to working out a permanent solution. It has recommended a service-at-cost plan under which the rate of return would be 6 per cent, plus a supplementary incentive depending upon the rate of fare. Elimination of requirements for street paving, cleaning, etc., was also recommended.

DES MOINES

The franchise under which the city of Des Moines, Iowa, has been operating for a number of years, having service-at-cost features but with fare limitations, also proved unsatisfactory and receivership followed. In an effort to work out a new settlement Des Moines has recently had an appraisal made of the property for use in a real service-at-cost agreement. The ideas regarding valuation and other features of such settlement which have so far been advanced by the city have not been at all acceptable to the company, and no prompt settlement of the controversy is in prospect.

In all of the above cases it appears that difficulties have occurred on account of the fare limitations. To the extent that such limitations have been insisted upon by the city, results unsatisfactory alike to the railways and the communities have followed. Fare limitations within the range of reasonable requirements are noticeably absent from the proposed new grants, indicating that the cities are prepared to meet the cost of the service which, in the exercise of their rights, they prescribe for their own accommodation, regardless of what the necessary rate of fare may be.

Summary

A review of the foregoing outlines of action with respect to service at cost, taken or under consideration during the past two years in something over twenty cities, discloses some features of interest. Out of seven carefully developed and complete service-at-cost plans four were put into effect during this period, two were rejected upon being submitted to popular vote and one was withdrawn by the company before final action. Of the two rejected franchises, one had the hearty indorsement of the business interests and the city administration and was rejected by an exceedingly small margin, apparently on account of the fear of radical increases in fares. The other rejection was largely the result of pronounced opposition on the part of the Mayor. In neither case was the opposition based upon specific criticisms of fundamental principles of the program.

Of the dozen cities in which less complete consideration has been given to service-at-cost operation, there have been three cases of definite rejection. Of these three rejections, one was based wholly upon political grounds and was against the recommendations of an investigating commission and of business men generally. Another was apparently due to unwillingness to accept the probable higher cost of transportation which the program involved. Only in the third case of rejection was there any criticism of the principles upon which service at cost is based. In Indianapolis, after investigation of service-at-cost operations in other cities by the chairman of the State commission and other interested officials, it was agreed that none of the plans in operation or proposed provided adequate insurance against inefficient operation because of the lack of incentive for efficiency so far developed.

Because of the specific rejection of one service-at-cost plan on the grounds of lack of suitable incentive to efficient operation, and criticisms to the same effect from a number of other sources, it appears appropriate to give some consideration to this phase of the subject. Clearly if, as claimed, the result of service-at-cost operation is that the properties are managed without proper regard to reasonable limitations in wages and salaries, to the

procuring of necessary supplies at lowest obtainable market prices and to the utilization of labor, materials and appliances in accordance with the best modern practice, a serious defect exists, and if this defect cannot be corrected, service at cost may not be wholly acceptable as a solution of our railway problems. If, on the other hand, a study of actual service-at-cost results shows that inefficiency has not been in evidence or that suitable incentives to prevent it are available, then this alleged defect need not be considered as vital.

In the report of the Federal Electric Railways Commission the following reference to service at cost appears:

Generally speaking, the main criticism of this form of contract is that it tends toward inefficiency and uneconomic operation; that it contains no provision for the control of strikes or uninterrupted service, and that labor and management may co-operatively increase the cost of operation to the point where the public may be unduly burdened.

After further discussion of the subject, the commission decided that the criticisms are "more theoretical than real," and its general conclusion with reference to the matter is stated in the following language:

We strongly recommend the principles of the service-at-cost contract, not as the only solution but as one means of solving a very difficult problem.

As opposed to this strong recommendation, consideration should be given to statements made in connection with the Indianapolis investigation referred to herewith. In its motion for withdrawal of the application to the Public Service Commission for the development of a service-at-cost plan for Indianapolis the city said:

We have been unable to find or agree upon any plan of operation on the basis of service at cost which would furnish the incentive of private ownership in an operation of service at cost. The result of our investigations generally has been to raise a most serious question and doubt as to the wisdom of the service-at-cost plan. The inevitable tendency seems to be for the operator or company readily to accept increased cost of operation with the view that it can be passed on to the public by higher fares. Such a course results only in adding to the burden of the public.

E. C. Lewis, chairman of the Indiana commission, in an address delivered at a recent meeting of the National Municipal League in Indianapolis, made the following statement with reference to the outcome of an investigation of actual service-at-cost results which he and attorneys representing the city and the railway company had made:

I fear that service at cost simply means that the lid is taken off. It is possible that some time in the future some workable plan incorporating incentive for efficiency and initiative will be worked out. While the commission does not pass finally on service at cost, nevertheless it seems to most of us to run contrary to human nature, which, at least in business, requires opportunities of a struggle for gain. Psychologically, the blocking out of rates which shall apply if operating expenses increase threatens to become an open invitation for laxity.

At the same meeting in Indianapolis Fielder Sanders, Street Railroad Commissioner under the Cleveland franchise, expressed contrary views, contending that, because of the unparalleled period of operation under this grant and the entire lack of special incentive for efficient operation, Cleveland should be the best possible test of alleged extravagance. Logically, Mr. Sanders holds, the test of efficiency is the rate of fare in effect to cover the cost of service. The Cleveland fare has been consistently as low as or lower than that in other cities of similar size in which fares have admittedly covered the cost of service. It has been at times contended that

the fare in effect in Cleveland did not cover the entire cost of service, but, as far as operating costs and provisions for current upkeep of the property are concerned, such criticisms would not hold, at least during the past few years.

Experience in other cities has been comparatively brief, but, as far as it goes, there have been no reported charges of extravagant operation in any case with the possible exception of Cincinnati. In connection with the Indianapolis investigation, it was pointed out that fares in Cincinnati had rapidly risen to a point much higher than in Indianapolis, but only by inference could it be held that inefficiency in Cincinnati was alleged. Careful comparative studies have clearly shown that operating conditions in Cincinnati are decidedly unfavorable and necessarily involve high costs. Published reports indicate that the operations of the Cincinnati railway have had uniformly careful attention and the closest scrutiny from both city and company officials. The inference is, therefore, fairly drawn that the menace of inefficiency due to lack of incentive is, as stated by the Federal Electric Railways Commission, "more theoretical than real."

TREND TOWARD INCENTIVE FEATURES

Notwithstanding this conclusion, a noticeable number of new franchises have included incentive features. Of the four complete programs which became effective during the past two years one contained a provision for increased rate of return when low fares were maintained. Of the three complete drafts which were either rejected or withdrawn, two contained similar incentive clauses. Among the other cities in which service at cost has been discussed at least two of the tentative programs included incentive features. This indicates a fairly definite feeling that incentive is desirable, and there is undoubted truth in the contention that the hope of reward is conducive to increased alertness. The whole history of business activities is corroborative of this view. It has been claimed by certain critics of service at cost that an incentive provision converts it into a cost-plus proposition. If such were the result, the purpose of such a provision would be defeated and it should be abandoned. The real purpose of an incentive clause is so to increase efficiency of operation that the investors may share in the resultant saving in service cost and fares may also be reduced below those prevailing without such incentive.

An examination of the incentive clauses so far provided discloses very few which are directly effective under present conditions. The operating bonus included in the Montreal grant undoubtedly encourages careful operation and will continue to do so unless the annual allowances are so closely adjusted by the Tramways Commission as ultimately to discourage the hope of obtaining the bonus. In other franchises the incentive is based upon the rate of fare on the assumption that more economical operation will produce lower fares, which, in turn, will yield a higher return for the investors. Recent increases in operating costs have necessitated fares so high that no supplementary returns have been available, and unless or until operating costs are substantially reduced the effectiveness of established incentive provisions will be negligible.

It has been pointed out that, under widely varying costs of service, the incentive provision really operates as a penalty, because, when operating costs are high,

money costs are correspondingly high, whereas investors should have a higher return instead of the lower one which is actually available under the operation of the established incentive provisions. And the reverse of this proposition is equally true, *i. e.*, that when operating costs and money rates are low the supplementary return may not be needed adequately to compensate the investors in the enterprise.

It appears, therefore, that some different form of incentive should be devised if an incentive is really desirable. In connection with one of the recently rejected service-at-cost plans an interesting provision was drafted which appears to have some merit. It was rejected in part because of its obvious complications. This incentive provision was based upon the assumption that railway costs of service increase substantially in proportion to costs in other productive industries, and that if some measure of such other costs can be established the relation between the two costs might be made the basis of a supplementary return to electric railway owners. The difficulties of establishing a measure of general costs in industry are obvious. The most logical basis appears to be the weighted average wholesale price of commodities as represented by the index numbers regularly determined by the United States Bureau of Labor Statistics. Before the recent war this index number was fixed at 100. At that time a 5-cent fare was practically universal on electric railways, and no one will contend that such a fare was unreasonably profitable. The ratio between the wholesale index number in 1914 and the prevailing cash fare in cents was 20 to 1. Since 1914 the wholesale index number has increased more than 100 per cent. Only a negligible number of street railway fares, if any, have increased in proportion. The lower the fares could be kept in proportion to this index number the more efficient railway operation would appear to be. If, for example, with a wholesale index number of 210, which is not far from that now prevailing, a 7-cent fare is maintained, a ratio of 30 to 1 exists instead of 20 to 1, which prevailed before the war. In the proposed draft on this basis, above referred to, a supplementary return of 1 per cent was authorized when the ratio of wholesale index number to average fare was 20 to 1, or lower. It became zero with a ratio of 30 to 1, or higher, and was uniformly variable for the ten steps between these two limits.

The complications of an incentive provision of this particular form may be prohibitive, but if a workable and readily understood incentive plan embodying the principles stated could be developed it would appear to have advantages in logic and effectiveness over any of the incentives so far offered.

In the absence of an effective feature of this kind service at cost has so far been generally successful in maintaining good service and credit and in avoiding receiverships and local controversies, which are detrimental to communities as well as railways. The delays incident to prolonged investigations by public service commissions or other regulatory authorities or court proceedings have also been avoided. This feature alone may more than offset any slight disadvantages otherwise accruing to service-at-cost cities. It is not clear that such disadvantages should be substantially greater under service-at-cost operation than under equally effective but less prompt regulation on the part of public service commissions.

Status of Heavy Traction Abroad

In All Countries Where Coal Is Scarce, and Especially Where Water Power Is Plentiful, Active Planning for Railway Electrification Is Under Way — Switzerland and Italy Are Naturally Among the Leaders, but France and Other European Countries, with Great Britain and Her Colonies, Are Not Far Behind

THE world electrification situation is not favorable for statistical analysis because the most interesting phases are still in the future and subject to much modification. At the same time the annual statistical issue of the *ELECTRIC RAILWAY JOURNAL* is an appropriate place in which to set down some of the plans which are being made and to point out the tendencies which these plans show. This article represents an attempt to do these things, although it is not intended to be comprehensive or exhaustive. It does not mention many electrifications which may seem to some to be important and it does not treat the situations in the several countries in a uniform fashion.

The article does, however, draw from a number of authoritative sources some of the latest information available as to the planning of the several countries which will profit greatly by electrification. Probably by the end of this year there will be much to record of the ways in which these plans are being carried to fulfillment.

Great Britain and the Colonies

Electrification Has Made Some Progress and Plans Are Being Made, but Much Depends Upon the Status of the Railways Still Undetermined

DOWN to the present time there are in all thirteen examples of conversion of steam railways in England to electric traction. This is apart from the London "tube" railways which were built as electric lines. Out of the thirteen, four are small undertakings which may be passed over by naming them, the East London Railway, the Hammersmith & City Railway, the Mersey Railway and the Morecombe & Heysham branch of the Midland Railway.

Coming to more important undertakings, it may be noted generally that the conversion was carried out to enable the lines to cope more successfully with heavy passenger traffic and to develop more of it in extra suburban areas. As regards parts of the lines in London which are underground, there was also the great advantage of getting rid of the fumes from steam locomotives. The result has been that traffic has grown so that sometimes it is almost overwhelming on certain routes. Electric traction is largely confined to passenger service. On those lines which also give freight service steam locomotives are still used.

LONDON WAS A PIONEER IN HEAVY TRACTION

The first two steam railways in London to be converted for electric operation were the Metropolitan District and the Metropolitan Railways. Both began electric working in 1905. The former has a route length of about 27 miles, but with its connections over which it runs the length is 41 miles, or more than 80 miles of track. This railway runs underground east and west through the heart of London, with several branches in

the western suburbs. In the East End it joins onto the Tilbury & Southend Railway, and its central section also forms part of the Inner Circle, the rest of which is owned by the Metropolitan Railway. A third-rail, positive conductor carries current at 600 volts, and a fourth rail, also insulated from earth, forms the return. Automatic interlocking signaling, supplemented by automatic train stops, permits a train service with less than two-minute headway to be given during the busy hours. Where the traffic is heaviest there is unfortunately only double track. With certain exceptions, all trains are on the multiple-unit system. About 240 motor cars and a like number of trailers are owned, each of the former being equipped with two 200-hp. motors. In addition, the company has six electric locomotives, each having four motors of 240-hp. capacity each. These locomotives are used for hauling over the company's lines through trains for Southend, 40 miles away on the coast. Steam locomotives take these trains when beyond the District Company's area.

STEAM ROADS GRADUALLY ADOPTING ELECTRIC TRACTION

The Metropolitan Railway owns the northern half of the Inner Circle and a main line with branches stretching out northwestward into the country. Only the lines in and near London have been electrified, the route length so treated extending to 26 miles, giving 59 miles of single track. The electric equipment is the same as that of the District Railway. There are some 160 motor cars and 250 trailers, each of the former having four 200-hp. motors. For some of the longer trips electric locomotives are used to haul ordinary railway rolling stock. The company owns twenty such locomotives, and each is fitted with four 200-hp. motors.

Electric traction began on one of the suburban lines of the London, Brighton & South Coast Railway about the end of 1909, and it was gradually extended to the other suburban lines until the war put a stop to further work. Some 22 miles of route, involving 70 miles of track, are operating electrically. This is the only example in England, apart from the short Morecombe line already mentioned, of single-phase traction. The voltage used is 6,700 and the frequency 25 cycles per second. Overhead contact construction is, of course, used.

The second of the big railway companies running out of London to adopt electric traction for its suburban service was the London & North Western, its first electric section starting in 1914. It took over and converted the North London Railway (steam), which serves the city and the region north of the metropolis and connects with the North Western's main line. This railway built two additional tracks electrically equipped alongside its main line all the way to Watford, some 20 miles out, and began an expensive widening involving additional tunnels in North London to bring the electric service right into its London terminus at Euston. The last-mentioned work, tied up by the war, is not yet completed.

The Baker Street & Waterloo Railway Company in 1917 extended its tube railway northward to a junction with the North Western near Willesden, and through electric trains are run from it on to Watford. When the scheme is complete North Western suburban passengers will have a choice of three routes into or out of London. The electric zone extends to 41 miles of route with 80 miles of track. The equipment is similar to the other underground railways, and multiple-unit trains are run throughout.

The last electrification scheme carried out in the London area was that of the suburban lines of the London & South Western Railway. The first section began working electrically in 1915, and despite difficulties arising out of the war the work of conversion was continued until all the routes for a distance of more than 10 miles out of the metropolis were equipped. The length of route so dealt with is 49 miles, involving 150 miles of track. Unlike most of the electric railways in the district, this one uses no fourth rail negative conductor, the track rails forming the return. The unit train consists of three coaches—heavy compartment rolling stock with cross-seats as on the steam lines. The horsepower of the motors per train is about 1,100. When required, two units are coupled to make a six-car train. About 300 ordinary steam railway carriages have been converted for the electric service. It should be understood that only some of the numerous tracks on the main line out of Waterloo terminus have been electrified, the long-distance steam trains running over the others.

SOME ELECTRIFICATION AWAY FROM LONDON

There are only two important examples of steam railway electrification in the provinces, one being parts of the system of the Lancashire & Yorkshire Railway and the other the Newcastle suburban and Tyneside lines of the North Eastern Railway. In regard to the former, the start was made by the opening for electric service in 1904 of the main line from Liverpool to Southport. This was the first example in the country of something like a main electric railway with stations at considerable distances apart and consequent high speeds. It is on the ordinary third-rail, 600-volt, direct-current system and multiple-unit trains are used throughout. Several branch lines were afterward electrified, and more recently the railway made a new departure by equipping its Manchester-Bury section, comprising some 27 miles of track, with protected side-contact third-rail conductor carrying direct current at 1,200 volts. This is the first thing of the sort in England and it has proved highly satisfactory. In all about 60 miles of route, or 120 miles of track, of the Lancashire & Yorkshire Railway is working electrically. The motors aggregate 800 hp. per motor car, and some 200 motor and trail cars are in use.

The Newcastle local lines of the North Eastern Railway were electrified in 1904, and have a route length of 35 miles, with 82 miles of track. The usual third-rail system is employed. The multiple-unit trains have in all about seventy motor cars (each with two 150-hp. motors) and sixty trail cars.

The North Eastern Railway in 1915 electrified its Shildon to Newport (Middlesbrough) mineral railway, 19 miles long, with overhead contact conductors and 1,500 volts direct current. Electric locomotives are used for hauling the coal trains from the mines down to the port and bringing them back empty. This is the only example of the kind in England.

In regard to plans for the future, there is no prospect of any railway in Great Britain carrying out any electrification until the status of the railways is defined. At present they are still under government control and their finances are not healthy. The control is to come to an end in August next and what will be the conditions after that it is hard to say. Large sums are in dispute between the companies and the government under various war agreements as to guaranteed receipts, maintenance, etc. No capital can be raised for railway purposes until the future is clearer. Besides that, the high cost of equipment at present favors delay.

Looking forward, the directors of the London, Brighton & South Coast Railway have submitted for the approval of the Minister of Transport a complete scheme for the electrification of the great bulk of their system, including the main line to Brighton. The single-phase system will be used as on the existing electric lines of the same company. Developments on other railways are likely to be carried out on the direct-current system at 1,500 volts, as recommended by the Ministry's advisory committee. The North Eastern Railway directors a year or more ago approved in principle the conversion of their main line between York and Newcastle, a distance of 80 miles, and of a loop between Northallerton and Stockton-on-Tees, 31 miles long. The York-Newcastle part is specially important, because the east coast expresses between London and Scotland travel over it, and to preserve if not improve the speed of these trains the electric locomotives will have to be capable of making 60 or 70 m.p.h.

The London & South Western Railway announced not long ago that its project of further electrification is hung up pending better times. The proposal is to extend electric traction as far out as Guildford on the main line and to convert also various country branch lines. This involves 45 miles of route, or 100 miles of track, in addition to the lines already electrified.

The Midland Railway is under an obligation to electrify its Tilbury and Southend section, some 40 miles long, but there are no immediate prospects. The Great Eastern Railway directors have spoken for years of the necessity of converting their London suburban lines, some of which carry probably the heaviest steam train passenger traffic in the world. A proposal is being made for the development of a great water power among the mountains of Scotland. Should this come about, it would probably lead to the electrification of the Highland Railway from Perth to Inverness. A possible development of a great tidal water power on the estuary of the River Severn, just suggested by the Ministry of Transport, might lead to considerable railway electrification.

BRITISH DOMINIONS LOOKING TO ELECTRIC TRACTION

The most important railway electrification work in the British dominions overseas is the conversion of the whole suburban railway system of Melbourne, Australia. These railways belong to the state, and so in spite of difficulties arising out of the war the work was gradually pushed forward. The first section began running electrically in 1919, and when all is complete the track mileage working electrically will be 335, mostly double-track, but in some places four and six-track. Direct current at 1,500 volts is used on overhead wire conductors, and multiple-unit trains are operated.

The other notable electrification is that of the Mount Royal tunnel lines in Canada, with which the readers of the *ELECTRIC RAILWAY JOURNAL* are familiar.

As to the future, the biggest thing in immediate prospect is the electrification of the South African State Railways. A beginning is to be made with the Cape Town-Simons Town suburban line and the section of the Natal main line from Durban to Pietermaritzburg. It is proposed to use direct current at 3,000 volts. The former line does a suburban passenger business, while the latter carries main-line traffic, both passenger and freight. Both have already reached their capacity under steam traction. The estimated cost of conversion and complete equipment of the Cape Town-Simons Town line, including a power station, is £1,269,000, while for the Natal line, including power station, locomotives, etc., the figure is £2,033,000.

Contracts have also been let for an electric railway 8 miles long, mostly in tunnel, through the mountains in the South Island of New Zealand. The line will connect the existing steam railways east and west of the mountain range. Direct current at 1,500 volts with overhead conductors will be used. The ruling gradient is 1 in 33, and the highest point on the line is 2,400 ft. above sea level.

France Planning Big Coal Saving by Electrification

Three of the Large Railway Systems Will Proceed to Adopt New Motive Power as Soon as Governmental and Financial Restrictions Are Removed

THE necessity for electrification of railways in France, while not as pressing as in some other European countries, is nevertheless receiving careful attention by the government and the Midi, Orleans and Paris-Lyons-Mediterranean railway systems. Utilization of water power, with consequent coal saving, is the primary purpose in the electrification. The whole matter is under consideration by a committee bearing the title "Comité d'études pour électrification des reseaux d'intérêt général." This contains representatives of the six large railway systems of the country and of related industries.

GOVERNMENT ANXIOUS TO CONSERVE POWER RESOURCES

The electrification committee comprises two sub-committees, one of which was commissioned to study the plans submitted by the Midi, Orleans and P-L-M Railways, the other being especially charged to study electric traction systems in service with special reference to standardizing on a single system if possible. The latter sub-committee studied operating systems in Switzerland, Italy and the United States. Its complete report has not as yet become available, but what is understood to be its substance appeared in the *Journal Officiel* in 1919. The preference appears to be for high-voltage direct current for a unified system for France, with 50-cycle transmission.

Among other considerations leading to the preference for this particular variety of current and voltage were the fear by the government of inductive interference between railway and intelligence-transmission lines, and desire for ability to use third rail and rotary converters, thus limiting the available voltage. It is interesting to note that the French preferences in these particulars coincide with those of their British confrères.

The electrification situation in France was depicted by M. Parodi, chief engineer of electric service of the

Compagnie d'Orleans in an article in the January, 1920, issue of the *Revue Generale des Chemins de fer et des Tramways*. He said that the wealth of the country in hydraulic resources, about 8,000,000 hp., will be developed as rapidly as possible. In 1913 the coal consumption was 66,000,000 tons while the production was less than two-thirds this amount. Of the total consumption the railways use nearly 8,000,000 tons. In a dozen years the deficit will probably be from 40,000,000 to 45,000,000 tons including the consumption in Alsace-Lorraine and the normal increase in requirements. By 1932 the railway consumption might reach 13,000,000 tons. The electrification of 5,100 miles of line, including the 93 miles already electrified by the Midi Railway, will reduce the coal consumption by more than 2,000,000 tons.

LARGE ELECTRIFICATION MILEAGES IN VIEW

The electrification projects which are in part now being carried out comprise the following:

The Midi system proposes to electrify 1,865 miles, constituting the whole of the system excepting the lines in the level regions around Bordeaux and Cete and the branches of these lines.

The Orleans system proposes also 1,865 miles of electrification in the Central Massis, from Chateauroux to Montauban, from Limoges to Gannat, and from Clermont to Tulle, with branches.

The Paris-Lyons-Mediterranean system proposes to electrify 1,367 miles commencing with the lines from Nimes to Langdome, from Culoz to Modane, from Lyons to Geneva, including the heavy-traffic lines from Lyons to Marseilles, from Marseilles to Vintimille, from Tarascon to Cete, etc.

During the latter part of 1920 plans for considerable electrification have received governmental sanction and the Midi Railway is reported to have placed contracts for hydraulic machinery and electric locomotives, while the Orleans Company is understood to have plans for the immediate carrying out of its program, beginning with the Paris terminal. Power for the Paris end of the system will be secured from the Paris super-power system, while the company will produce its own power hydraulically in its mountainous sections where power will probably also be available for sale.

Belgium Is a Logical Field for Electrification

This Small Country Provides a Field for a Vast Interurban Passenger System Plus One Permitting the Handling of Large Quantities of Freight

THE scheme for the electrification of the State Railways of Belgium is not so far advanced as some reports during the past year seemed to indicate. The fact is that the Belgian government is being advised by a small committee of railway engineers who are preparing a preliminary scheme which will be submitted to the commission appointed by the Belgian Government to report on the electrification of the railways. The commission consists of manufacturers, bankers, heads of railway departments and members of the various Belgian ministries, and it also includes French and British engineers. The president of the commission is Baron Ancion, and Sir Philip Dawson, so well known as a consulting electric railway engineer in England, is one of the vice-presidents. Many meetings have been held and reports made, and at present the commission is waiting for the preliminary

report above referred to from the committee of engineers. No electrification contracts will be let meanwhile.

However, Belgian railways ought to be electrified promptly, for the reasons listed by Sir Philip in his Liège address abstracted in the issue of this paper for Dec. 4, 1920, page 1151. He said in this connection: "As to Belgium, in view of its relatively small area, its dense population, its frugal and industrious people, its well-developed metallurgical and other industries, its excellent railroad systems and its fuel resources, its railways can be compared with a vast suburban system. If there is a case where a complete electrification would be justified, that case presents itself in Belgium. Here it is necessary to study fundamentally the electrification of the entire system, in such a way that the sections which are to be electrified now will form a homogeneous part of the whole from the points of view both of traction and distribution. Such a study will be costly, but when millions of francs are involved it seems worth the investment of some hundreds of thousands of francs so as to insure the obtaining of the best possible financial results."

In an article appearing recently in *l'Echo de la Bourse*, Brussels, an outline of a plan for the partial electrification of the State Railways is given. It comprises three phases: (1) Complete electrification of the Brussels-Antwerp line; (2) electrification of the Luxembourg line and connections; (3) electrification of various trunk lines radiating from Brussels. For this work direct current is favored, but a decision as to voltage, 1,500 or 3,000, had not been reached at the time the article was written.

Electrification Largely Prospective in Spain

Several Excellent Opportunities for Conservation, However, Are Recognized—People Wakening to Necessity for Conserving Fuel

THE heavy traction field in Spain is practically untouched. There are, however, several prospective electrifications and the people are wakening to the necessity for increasing track capacity and conserving fuel. One of the most imminent electrifications is that of the Pajares grade on the Norte Railway in the north of Spain. This line connects the north coast at Gijon and the coal mines on the north slope of the mountains with the inland cities. The line in question is one about 39 miles long and on a grade which is 2 per cent over a large part. The line is very crooked and has many tunnels, with a maximum length of 2 miles. It is single track and the light rolling stock and light track construction make it very difficult to operate freight trains of any considerable weight; in fact, the maximum train with two locomotives is 600 metric tons. It is hoped by the electrification of this grade to make a very great increase in the capacity.

Another very important project is that of the Las Arenas Railway at Bilbao, an important seaport. This is a meter-gage railway, but has fairly heavy suburban traffic. It will probably be electrified in the near future. The railway will probably use 1,500 volts direct current, as against 3,000 volts for the Norte. The next most active prospects are at Barcelona, where there are several railways that are considering electrification seriously.

There is an abundance of water power in the north of Spain, especially at Barcelona, where there are

several transmission lines with a considerable amount of power available. Barcelona is an up-to-date city and very wide awake. The inhabitants are known as the Yankees of Spain. There are one or two short electric railways there at this time, and others will soon follow.

The high cost of coal will greatly accelerate railway electrification in Spain, as well as in the other countries of Europe. The financial situation, however, is very much better, since the rate of exchange for Spain is so much better than in France and some of the other countries.

The railways of Spain seem to be, for many years at least, doomed to the use of very light trains, owing to the weak, almost flimsy, drawbar and buffer construction, as well as to the low permissible wheel loads. The cross ties in the track are spaced so far apart that the very light load of 15 tons per axle is scarcely permissible, even though an 80-lb. rail is used. The drawbars are being gradually strengthened, but it will be many years before they are able to handle as much as 20 tons pull.

Switzerland Is the Focus of Electrification Interest

Interest Centers in Lucerne-Chiasso Line, Which Includes St. Gotthard Tunnel, Now in Electric Operation—Federal Railways Have Comprehensive Program

IN OTHER countries there is much discussion of electrification; in Switzerland there is "something doing." During the past few months (since July 1) operation through the St. Gotthard tunnel has been by electric locomotives, power being drawn from the Lake Ritom hydro-electric plant in which four 12,000-hp. generator units produce power at 15,000 volts. This is part of a general program adopted over two years ago.

This country is one in which general railway electrification is a virtual necessity. The country depends upon its neighbors for coal, which now commands a prohibitive price, while it has abundant water power. Ordinarily about 600,000 tons of coal is required per annum by the railways, which can be entirely saved by the development of but a fraction of the available 3,000,000 hp. of water power. Fortunately the Swiss franc is worth in exchange nearly its par value so that the financial aspect of electrification work is not unfavorable.

A large part of the railway mileage of Switzerland (about 2,800 miles) is owned and operated by the federal government. After long study, and experience with both single-phase and three-phase, the Federal Railways in 1916 adopted 15-cycle, 15,000-volt single phase as standard, although three-phase will be retained on the Simplon tunnel line on account of its connection with the Italian lines on which three-phase is standard. The Federal Railways have adopted a program of electrification in three stages. The first includes 700 miles most favorably located for the purpose, with a corresponding hydraulic development of 76,000 hp. This will reduce the coal consumption by one-half. The second includes about 375 miles of light-traffic lines which are also favorably located, while the third includes the remainder which is left for future consideration.

To return to the St. Gotthard line; a section of the line from Lucerne to Chiasso, a distance of 140 miles. The tunnel is in electric operation, and the section from Erstfeld to Bellinzona is practically complete. On this section are grades up to 2.7 per cent. The Bellinzona-Chiasso section, connecting with the Italian lines, should

be finished during 1921, and shortly thereafter the Erstfeld-Lucerne section.

During the war 33 miles of line between Brigue and Sion was temporarily equipped with three-phase, on account of the availability of power from the Simplon. It will later be made single-phase. The nearly 20 miles from Berne to Thun was also electrified with single-phase in 1918.

The Ritom power plant is of interest on account of the high head under which the Pelton impulse water wheels operate, over 2,600 ft. The depth of Lake Ritom has been increased by a 23-ft. dam, and the conduit draws off the water 100 ft. below the dam crest. The available storage capacity is estimated at 900,000,000 cu.ft., more or less.

The St. Gotthard line will also be supplied with power from a plant, now building, at Amsteg, just north of the tunnel. This is located on the Reuss River, but there will be only a small water storage capacity. The Amsteg and Ritom plants will be operated in conjunction, utilizing the different capacity characteristics of the two. The Amsteg plant will run continuously, utilizing the full capacity of the river. The Ritom plant will care for peak loads, and will in general be shut down in summer to allow the lake to fill.

Latin America Not Idle

Electrification Work Is Actually Under Way in Brazil and Cuba—Direct Current Is Employed in Both Cases

TWO interesting high-voltage direct current electrifications are being carried out at present in Brazil and Cuba; the former a part of the Paulista Railway between Jundiahy and Campinas, the latter the Hershey Cuban Railway on the north coast of the island between Matanzas and Havana.

On the Brazilian road 3,000 volts will be used on the contact line. Ten 100-ton freight and six 120-ton passenger locomotives will be installed at once on the 28 miles of route now being electrified. This is a double-track line and the single-track equivalent in the electrified zone is 76 miles.

The locomotives to be furnished by the General Electric Company are similar in general construction to those in use on the Butte, Anaconda & Pacific Railway, but with the regenerative feature. The Westinghouse locomotives differ somewhat in wheel arrangement, but essentially they are of the same general type.

The Brazilian railway officials are looking forward with keen anticipation to the arrival of the new motive power which they believe will find operating conditions congenial on this high-class, well-maintained road.

On the Hershey Cuban Railway the voltage will be only 1,200, but overhead contact construction will be used. Electric locomotives will be used for freight service, and seven 60-ton machines will furnish the initial equipment. Multiple-unit cars will be employed in the passenger service. This electrification will ultimately involve a single-track equivalent mileage of 80.

The power distribution equipment of the Hershey Cuban Railway is of interest in that for the outlying substations automatic control will be used.

Considerable popular interest attaches to the Hershey Cuban Railway in the fact that the owner is the well-known chocolate manufacturer, and a considerable part of its business consists in transporting sugar cane to Hershey Centrale, an important sugar center.

Italy Clings to Three-Phase

Although Not Oblivious to Developments in Other Systems, This Country Will Extend Electrification Along Established Lines to Avoid Delays

ITALY has for many years pursued a consistent policy of electrification, although the actual mileage of line electrically equipped is not great, say 280 miles out of a total of 8,500. However, a considerable program has been laid out, both for the state and private railways, and much construction is actually under way. The government offers subsidies to private companies for the construction of railways, with extra allowances if the lines are electrified. The subsidies have recently been increased to render them more attractive, as those previously offered were not stimulating expansion to the extent desired. Provision is made by which the state can take over the permanent way and structures of the subsidized railways under conditions which are entirely fair. On the new lines now under construction or projected about two-fifths of the mileage will be equipped for electrical operation.

The Italian State Railways have long favored three-phase locomotives, operating at 16 cycles, a very low frequency. The latest type of locomotive was commissioned during the war and gave a good account of itself. A summary of the features of this type was given in the issue of the ELECTRIC RAILWAY JOURNAL for Aug. 4, 1917, page 189. Eighteen of this type of locomotive were purchased. The locomotive is designed for four speeds up to 62 m.p.h. The four-speed arrangement was selected to provide the low speed necessary on certain parts of the lines over which the machines had to operate and to minimize the rheostatic losses in passing from speed to speed.

For power supply the railways depend largely upon the power plants of the cities near the electrified lines. The situation is complicated by the low frequency of the railway power, the industrial frequency being 42 cycles. Where a power plant furnishes railway power it must have extra generators, which are sometimes mounted on the same shafts as the industrial machines. Frequency changers are apparently not used. Experiments will be conducted by the State Railways with 42-cycle current for use on the locomotives and also with the high-voltage direct current.

However, the program will be carried out as planned using three-phase and it is understood that 1,200 miles of line or more will be electrified in the near future.

The plan for electrification, as presented by the Railway Administration to the Minister of Public Works, was reported by Vice-Consul James J. Murphy, Jr., from Genoa, and printed in *Commerce Reports* for Sept. 3, 1920, page 1098.

It covers four groups as follows:

1. Lines to be electrified at once by the Railway Administration: Ovada to Sampierdarena, Genoa to Spezia, Florence to Pistoia to Bologna, Bologna to Faenza to Florence, Orte to Foligno, Rome to Naples with branches Carano to Nettuno and Piperno to Terrarina, Naples to Avezzano to Sulmona, Naples to Salerno to Gragnano, Savona to Altare to San Guiseppe, Brenner to Verona, Trieste to Piediroldo with branch Previncina to Aidustera, Chiasso to Monza to Milan. The length of the above totals nearly 830 miles.

2. Lines to be electrified as above but in the second period: Alessandria to Ovada, Spezia to Pisa, Spezia to Parma, Florence to Orte to Rome, Foligno to Falconara

to Faenza, Sulmona to Pescara to Falconara, Cesa to Mondovi to Forsano to Trofarello, Trieste to Monfalcone with branch to Nabresina Operina, Milan to Voghera. Total length of these lines, nearly 700 miles.

3. Lines on which new systems of electric traction will be tried: Rome to Anzio, Rome to Tivoli (3-phase with industrial frequency); Messina to Catania (high-voltage direct current); Cagliari to Monteponi (standard-voltage direct current). The combined length of these lines is about 160 miles.

4. Lines which will be electrified under private management: Savona to Ventimiglia, Turin to Venice, Milan to Bologna to Padua, Bologna to Verona, Mestre to Primolano to Trent, Florence to Pisa, Benevento to Salerno, Benevento to Foggia, Salerno to Battipaglia to Paola, Mestre to Portogruaro to Monfalcone. The lines have a total length of about 1,080 miles.

The grand total of all of the above lines is nearly 2,770 miles.

The plan comprehends that the lines south of the Pisa-Florence-Faenza line in the first and second groups will comprise power plants that can be operated at a frequency higher than 16 cycles in case the Rome-Anzio experiment with industrial frequency is a success.

American Engineering Council at Work

Active Steps Taken to Assume Work that Was Started by Engineering Council—Non-Member Societies Will Be Asked to Co-operate

HERBERT HOOVER, president of the Federated American Engineering Societies, presided at the executive board meeting of the American Engineering Council of that organization, held in New York on Friday, Dec. 17. Every one of the twenty-four members of the council was present with the exception of A. M. Greene.

The president appointed the following standing committees:

PROCEDURE

	Calvert Townley, chairman
Herbert Hoover, ex officio	J. Parke Channing
W. E. Rolfe	L. W. Wallace
D. S. Kimball	L. P. Alford

CONSTITUTION AND BY-LAWS

	W. B. Powell, chairman
C. F. Scott	D. S. Kimball

PUBLICITY AND PUBLICATIONS

	L. P. Alford, chairman
H. W. Buck	H. E. Howe

MEMBERSHIP AND REPRESENTATION

	J. F. Oberlin, chairman
L. W. Wallace	A. S. Dwight

FINANCE

	William McClellan, chairman
E. Ludlow	C. Townley
	L. W. Wallace, ex officio

PUBLIC AFFAIRS

	J. Parke Channing, chairman
Fred J. Miller	L. B. Stillwell

In discussing the program of the council immediately ahead, Mr. Hoover stated that he had called engineers together in various cities he had visited lately and that he found that the general desire of engineers everywhere was to join in the federation movement, but that the general trend was for territorial organization, as distinguished from national organization. One of the stumbling blocks in the way of these territorial

organizations joining the national organizations was the question of dues. Another complexity was that individuals hold memberships in more than one society. This question was discussed and referred to a special committee, which will include the six district delegates.

As a step forward in co-ordinating various inter-society activities already established, the necessary action was taken to make it possible for certain of the activities of Engineering Council to be taken over by the new organization. As soon as the United Engineering Societies have passed officially upon the proposed action of Engineering Council to transfer and continue the work of Engineering Council's committees which have not yet completed their work the president will appoint the necessary committees of American Engineering Council to take over this work. At the meeting of Engineering Council held in Washington, there was harmony of all the member societies in Engineering Council to this end. In this connection, action was taken to amend the by-laws so that members of committees can be selected from societies other than those at present members of the federation. Civil engineers and engineers in other bodies not at present affiliated with the Federated American Engineering Societies can, because of this action, co-operate in the committee work.

The four so-called founder societies in addition have been associated in a common employment service and American Engineering Council has offered to take over this service as a part of its function.

American Engineering Council voted not to affiliate with the United States Chamber of Commerce, but it expressed its desire to co-operate with the Chamber at any time and give advice on any question that may arise. It was the thought of the meeting that the council could make its best contribution to the public by acting independently.

The council authorized the appropriation of \$1,000 as an initial fund to carry on publicity work, and the committee on publicity and publications was given authority to set up a board of engineering editors.

A special committee reported on candidates for permanent executive secretary of the organization, but no final action was taken at the meeting.

There was a general feeling expressed that the meetings of the board should be held at different centers, and the place of the next meeting, which will be held Feb. 11, was left to the discretion of the president.

Safety Car Recommended to English Tramway Managers

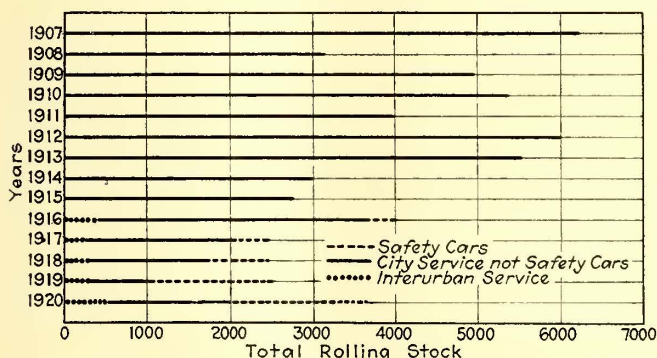
TO ENGLISH tramway managers the *Electric Railway and Tramway Journal* of Nov. 12, 1920, recommends for earnest consideration J. C. Thirlwall's article on the safety car which appeared in the *ELECTRIC RAILWAY JOURNAL* of Oct. 2, 1920. It points out the fact that in spite of the distinct success and popularity in this country of one-man cars not a single British system has considered their adoption even as a partial solution of operating difficulties. Their backwardness in failing to realize the economies resulting from their lightness and one-man operation can be attributed, perhaps, to their ultra-conservatism. However, it cannot be overlooked that circumstances which are necessary for the success of the safety car may not be existent in England yet and their wide use here does not give proof of their permanent utility.

New Rolling Stock Ordered in 1920

Approximately 50 per Cent More Cars Ordered than During the Year Previous—Safety Cars Still Represent the Largest Proportion of the Total, 113 Companies Ordering 1,699 Safety Cars—Both Urban and Interurban Passenger Cars Increase by Large Percentages—Freight and Express Cars Nearly Treble

THE statistics in the following tables regarding new cars and locomotives ordered during 1920 by the electric railway companies of the United States and Canada indicate the need on many lines for additional equipment to care for existing traffic. A step was made last year to acquire additional rolling stock. In 1919 the new rolling stock ordered was 2,447 cars. The results this year show a much more promising future, since the new cars and locomotives ordered have reached a total of 3,598 cars, which is 1,151 more than last year, or a percentage increase of 47.5 per cent.

The main reason for this large increase in car orders is due to the more extensive use of the one-man car. Many companies, and especially is this true west of the Mississippi River, are supplanting their equipment with these lighter cars, which are less expensive to operate and to maintain. Although many companies which had previously ordered one-man cars enlarged



NEW CARS AND LOCOMOTIVES ORDERED BY YEARS
In this chart the division by city and interurban cars is not made prior to 1916.

their equipment by the purchase of more, the number of new companies ordering them is very noticeable. The number of companies this year which invested in this type of car is 113.

These 113 companies, which are approximately 13.5 per cent of all those in the United States and Canada, purchased 1,699 one-man cars. This is quite a gain over last year and may be assumed to prove the fact that the light weight one-man car has been able to compete with the jitney. As is shown in the chart accompanying this article, the light weight one-man cars were practically unknown until 1916, when only 187 of these cars were ordered. The number ordered during 1920 is nearly ten times as many as in 1916. Most of the one-man cars were ordered in the United States, only thirty of the total being ordered by Canadian companies. The types of cars are divided into motor or trailer, two-man passenger, city or interurban, and freight and express cars, city or interurban, besides the one-man cars. Of the total number the latter occupy the most prominent position, with a total of 1,699 cars, or approximately 47.5 per cent of all the cars ordered during the past year. While the percentage of one-man cars to the

TABLE I—NEW ROLLING STOCK ORDERED SINCE 1907

Year	Passenger Cars		Freight and Misc Cars	Electric Locomotives	Total
	City	Interurban			
1907	3,483	1,327	1,406	(a)	6,216
1908	2,208	727	176	(a)	3,111
1909	2,537	1,245	1,175	(a)	4,957
1910	3,571	990	820	(a)	5,381
1911	2,884	626	605	(a)	4,015
1912	4,531	783	687	(a)	6,001
1913	3,820	547	1,147	(a)	5,514
1914	2,147	384	479	(a)	3,010
1915	2,072	336	374	(a)	2,782
1916	3,046	374	491	31	3,942
1917	1,998	185	223	49	2,455
1918	1,842	255	278	44	2,419
1919	2,129	128	172	18	2,447
1920	2,889	227	465	17	3,598

(a) Included in "Freight and Miscellaneous Cars."

total is 9 per cent less than in 1919, this fact does not characterize the growth as much as the actual increase of 316 cars.

In order to show the progress of the industry at a glance a table has been prepared showing the rolling stock ordered each year since 1907, divided into four types of cars: passenger cars, city or interurban; freight, express and miscellaneous cars, and electric locomotives. In this table passenger cars for operation in subway and on elevated structures have been taken as city passenger cars. The miscellaneous cars include service cars, as snow plows, sweepers, work cars, etc.

Due to the large increase in safety cars, which all come under the head of city passenger cars, an increase of 39 per cent will be noted in this column. At the same time the total of each of the other types of cars has likewise increased except in the use of the electric locomotives.

The electrification of steam railroads was at a standstill during 1920. An indication of this was the fact that only seventeen new electric locomotives were ordered during the year, and further, that these were mostly ordered by electric railways for switching purposes or the haulage of freight cars.

In the gathering of the data for this article questionnaires were sent to about 785 electric railway companies in the United States and replies were received from about 91 per cent of them. The remaining 9 per cent are small companies.

TABLE II—SPECIAL COMPARISONS OF NEW ROLLING STOCK ORDERED

	1920	1919	1918	1917	1916
Number of railways reporting new cars.....	172	160	140	182	250
Total number of cars.....	3,581	2,429	2,375	2,406	3,911
City Service:					
Number of safety cars.....	1,699	1,383	644	280	187
Number of two-man passenger motor cars*....	847	635	1,068	1,316	2,731
Number of passenger trailers.....	343	111	130	402	128
Service cars.....	104	31	(a)	(a)	(a)
Total city service cars.....	2,993	2,160	1,842	1,998	3,046
Interurban Service:					
Number of two-man passenger motor cars....	195	96	200	158	303
Number of passenger trailers.....	32	32	55	27	71
Number of freight and express cars.....	361	141	(a)	(a)	(a)
Total interurban service cars.....	588	269	255	185	374
Number of electric locomotives.....	17	18	44	49	31
Number of cars and electric locomotives built in railway companies' shops.....	166	165	89	281	445

*Includes motor and trailer cars for subway and elevated in New York City.
(a) Not available.

TABLE III—ROLLING STOCK ORDERED DURING 1920

New England District					New York:				
Number	Type	Over-all Length	City or Interurban	Motor or Trailer	Number	Type	Over-all Length	City or Interurban	Motor or Trailer
Connecticut:					Binghamton Ry. Co. 10 Passenger 47' 0" C M				
Bristol & Plainville Tramway Co. 3 Passenger 39' 0" C M					City of New York Municipal Ry. 28 Safety 28' 0" C M				
Connecticut Co. (New Haven).... 20 Safety 28' 0" C M					Empire State Railway Co. 6 Safety 27' 10" C M				
Danbury & Bethel St. Ry. 30 Safety 27' 10" C M					Hudson Valley Railway Co. 3 Passenger 53' 7" I M				
6 Safety 28' 0 1/2" C M					(Glens Falls) 2 Passenger 50' 0" I C M				
4 Safety 39' 0" C M					Manhattan Bridge 3c. Line..... 2 Passenger 44' 6" C M				
Maine:					New York Central R.R. 15 Passenger 69' 5" I C M				
Androscoggin & Kennebec Ry. 3 Safety 28' 0" C C M					New York Municipal Ry. Corp. 200 Passenger 67' 0" I C M				
Co., Lewiston..... 10 Passenger 45' 0" C M					Orange County Trac. Co. (New- 3 Safety 28' 0 1/2" C M				
* 2 Snow plow 25' 0" C & I M					burgh) 2 Safety 28' 0" C M				
Biddeford & Saco R.R. Co. 2 Safety 28' 0" C M					Peekskill Lt. & R.R. Co. 4 Safety 27' 9 1/2" C M				
Cumberland County Pwr. & Lt. 8 Safety 28' 0" C M					Poughkeepsie & Wappingers Falls 1 Snow swpr. 30' 0" I M				
Co., Portland..... 1 Snow plow 30' 0" I M					Ry. 7 Safety 27' 10" C M				
1 Snow swpr. 24' 10" C M					Rochester, Lockport & Buffalo 1 Express 28' 0" I C M				
Knox County Electric Co., Rock- 1 Passenger 28' 0" C M					R. R. Corp. 1 Snow plow 28' 0" I C M				
land..... 1 Passenger 49' 9" C M					Westchester St. R.R. Co. (White 1 Passenger 43' 0" I M				
1 Passenger 43' 0" I M					Plains) 6 Safety 27' 10" C M				
Massachusetts:					Ohio:				
Berkshire St. Ry. Co., Pittsfield... 12 Safety 28' 0" C M					Cleveland Railway Co. 50 Passenger 52' 5 1/2" C M				
30 Passenger 48' 9 1/2" C M					50 Passenger 49' 2" C T				
65 Passenger 46' 7 1/2" C M					Columbus, Delaware & Marion 5 Freight 42' 0" I M				
75 Passenger 48' 2 1/2" C M					Elec. Co. 8 Passenger 62' 5" I M				
Boston Elevated Railway Co. 80 Safety 28' 0 1/2" C M					Dayton & Troy Electric Ry. Co. 16 Safety 28' 0" C M				
2 Snow plow 42' 4" C M					Lake Shore Electric Ry. (Cleve- 15 Freight 55' 0" I C M				
2 Snow swpr. 39' 0" C M					land) 25 Passenger 50' 0 1/2" I T				
* 1 Line car 36' 6" C M					31 Passenger 50' 0 1/2" I M				
Boston & Worcester St. Ry. 1 Safety 27' 10" C M					Northern Ohio Trac. & Lt. Co. 10 Passenger 46' 8 1/2" C T				
Brockton & Plymouth St. Ry. Co. 3 Safety 28' 0" C M					(Akron) 20 Passenger 55' 11" I C M				
City of Attleboro 1 Safety 27' 10" C M					25 Safety 28' 0 1/2" C M				
Eastern Mass. St. Ry. Co. 50 Safety 28' 0 1/2" C M					3 Snow swpr. 28' 2" C M				
29 Snow swpr. C M					Ohio Service Co. (Coshocton).... 2 Safety 28' 0 1/2" C M				
Northampton St. Ry. 2 Snow swpr. C M					Pennsylvania-Ohio Electric Co. 10 Passenger 52' 11 1/2" I C M				
Springfield St. Ry. Co. 10 Safety 28' 0" C M					(Youngstown) 12 Safety 28' 0 1/2" I C M				
New Hampshire:					Southeastern Ohio Ry. Co. 1 Passenger 48' 2" I M				
Laconia St. Ry. Co. 2 Safety 28' 0" C M					Toledo, Fostoria & Findlay Ry. 1 Freight 58' 0" I M				
Rhode Island:					Pennsylvania:				
Newport & Providence Ry. Co. ... 2 Safety 28' 0" C M					Beaver Valley Trac. Co. 10 Safety 27' 10" C M				
Vermont:					Chambersburg, Greencastle & 1 Passenger 48' 0" I M				
Barre & Montpelier Trac. & Pwr. 2 Safety 28' 0" C M					Waynesboro St. Ry. 2 Passenger 45' 0" I M				
					4 Safety 30' 0" C M				
					1 Express 41' 8" I M				
					Eastern Pennsylvania Rys. (Potts- 10 Safety 47' 0 1/2" C M				
					ville) 2 Passenger 47' 0 1/2" I M				
					Eprata & Lebanon St. Ry. Co. ... 1 Express 50' 0" I C M				
					Harrisburg Railways Co. 2 Snow swpr. 28' 3" I C M				
					Hershey Transit Co. 2 Passenger 41' 8" I M				
					Indiana County St. Ry. Co. (In- 3 Passenger 44' 5" I M				
					diana) 4 Safety 28' 0 1/2" C M				
					Northumberland County Ry. 25 Passenger 45' 0" C T				
					(Sunbury) 25 Passenger 45' 0" C M				
					Pittsburgh Rys. Co. 12 Safety 27' 10" C M				
					1 Dump 40' 6" C M				
					Reading Transit & Lt. Co. 12 Safety 27' 10" C M				
					Shamokin & Mt. Carmel Transit 2 Safety 28' 0 1/2" C M				
					Co. 2 Passenger 47' 0" I M				
					State Belt Transit Co. (Pen Argyl) 1 Safety 27' 9 1/2" C M				
					Susquehanna Trac. Co. (Lock 1 Snow swpr. 28' 3" C M				
					Haven) Tarentum, Breckenridge & Butler 1 Safety 28' 0 1/2" C M				
					Ry. Trenton, Bristol & Phila. St. Ry. 6 Safety 28' 0 1/2" C M				
					Co. 6 Safety 28' 0 1/2" C M				
					1 Snow swpr. 41' 8" I M				
					Warren Street Railway 1 Snow swpr. C M				
					Westmoreland County Ry. (Pitts- 4 Safety 28' 0 1/2" C M				
					burgh) * 2 Express 59' 0" I M				
					West Penn Railways 20' 0" I T				
					* 2 Dump 20' 0" I T				
					Wilkes-Barre Ry. Co. 5 Passenger 48' 0" I M				
					Woodlawn & Southern St. Ry. Co. 4 Safety 28' 0 1/2" C M				
					6 Passenger 45' 0" I M				
					1 Swpr. 29' 0" C M				
					Wisconsin:				
					Beloit Traction Co. 2 Safety 28' 0 1/2" C M				
					Janesville Traction Co. 5 Safety 28' 0" C M				
					Madison Railways Co. 8 Safety 30' 0" C M				
					40 Safety 28' 0" C M				
					100 One man 45' 0" C M				
					* 2 Express 50' 0" I M				
					* 2 Express 50' 0" I T				
					Milwaukee Elec. Ry. & Lt. Co. ... 4 Dump. 40' 6" C & I M				
					8 Dump 40' 6" C & I T				
					4 Dump. 21' 6" C & I T				
					* 6 Work C & I T				
					8 Other types C & I T				
					Wisconsin Public Service Co. 6 Safety 28' 0" C M				
					(Green Bay) Wisconsin Valley Elec. Co. (Wau- 4 Safety 28' 0 1/2" C M				
					sau)				
North of the Ohio and East of the Mississippi River					South of the Ohio and East of the Mississippi River				
District of Columbia:					Alabama:				
Washington & Old Dominion Ry. * 1 Passenger 40' 0" I M					Alabama Pwr. Co. (Birmingham). 4 Safety 28' 0 1/2" C M				
Illinois:					Mobile Lt. & R.R. Co. 2 Safety 28' 0 1/2" C M				
Aurora, Plainfield & Joliet Ry. ... 1 Safety 28' 0" C M					10 Safety 27' 9 1/2" C M				
Chicago Surface Lines..... * 51 Passenger 47' 6" C T					Montgomery Lt. & Trac. Co. 10 Safety 28' 0" C M				
Decatur Ry. & Lt. Co. 6 Snow swpr. 28' 3" C M					* 1 Passenger 22' 6" M				
Illinois Traction Co. (Peoria).... 6 Safety 28' 0 1/2" C M									
Pekin Municipal Ry. Co. 3 Safety 28' 0" C M									
Rockford & Interurban Ry. Co. ... 12 Safety 28' 0" C M									
Springfield Consolidated Ry. Co. 17 Safety 28' 0" C M									
Indiana:									
Gary & Hobart Traction Co. 1 Safety 28' 0" C M									
Indiana Rys. & Lt. Co. (Kokomo) ... 2 Passenger 45' 0" I T									
3 Work 24' 0" I T									
Indiana Service Corporation (Fort 4 Freight 40' 0" I T									
Wayne) 8 Passenger 62' 0" I M									
Interstate Public Service Co. 1 Passenger 50' 0" I T									
15 Freight 42' 1" I T									
Public Utilities Co. (Evansville) .. 8 Safety 28' 0" C M									
Terre Haute, Indianapolis & East- 10 Safety 28' 0" C M									
ern Trac. Co. 8 Safety 28' 0" C M									
Winona Interurban Ry. Co. (War- * 6 Freight 36' 0" I T									
saw)									
Maryland:									
Cumberland & Westernport Ry. 1 Bag. & exp. 41' 8" I M									
(Frostburg) 100 Passenger 46' 10" C T									
United Rys. & Elec. Co. of Balti- 33 Safety 28' 0 1/2" C M									
more.....									
Michigan:									
City of Detroit Municipal Ry. 25 Safety 27' 10" C M									
Detroit United Rys. 12 Safety 28' 0 1/2" C M									
1 Freight 50' 0" I M									
Escanaba Trac. Co. 2 Passenger 45' 0" I M									
1 Snow swpr. 28' 6" I M									
Grand Rapids Ry. Co. 19 Safety 28' 0 1/2" C M									
Michigan Railroad Co. (Jackson) 20 Freight 50' 0" I M									
Michigan Rys. Co. (Kalamazoo) .. 8 Safety 27' 9 1/2" C M									
Michigan United Rys. Co. (Jack- 20 Safety 28' 0 1/2" C M									
son)									
Muskegon Trac. & Lt. Co. 6 Safety 28' 0 1/2" C M									
8 Safety 28' 0" C M									
Saginaw Bay City Ry. Co. 20 Safety 28' 0 1/2" C M									
1 Sweeper C M									
New Jersey:									
Pennsylvania—New Jersey Ry. 7 Safety 35' 4" C M									
Co. (Trenton) 200 Safety 27' 10" C M									
Public Service Ry. Corp. (Newark) 100 Passenger 49' 9" C T									
15 Snow swpr. 30' 6" C & I M									
15 Snow plow 40' 8" C & I M									
6 Safety 28' 0 1/2" C M									
Salem & Pennsgrove Trac. Co. ... 6 Safety 28' 0 1/2" C M									
Trenton & Mercer County Trac. 40 Safety 28' 0 1/2" C M									
Co.									

* Built in companies' own shops.

† Rebuilt.

‡ Second band.

TABLE III—ROLLING STOCK ORDERED DURING 1920—CONTINUED

	Number	Type	Over-all Length	City or Interurban	Motor or Trailer
Florida:					
Municipal Railways of St. Petersburg	8	Safety	27' 9 1/2"	C	M
Tampa Electric Co.	8	Safety	28' 0 1/2"	C	M
Georgia:					
Athens Ry. & Elec. Co.	5	Safety	28' 0 1/2"	C	M
Atlanta Northern Ry. Co.	4	Passenger	50' 6"	I	M
Columbus Railroad Co.	9	Safety	28' 0 1/2"	C	M
Georgia Ry. & Pwr. Co.	23	Passenger	44' 6"	C	M
North Carolina:					
Tidewater Power Co. (Wilmington)	10	Safety	28' 0 1/2"	C	M
South Carolina:					
Southern Public Utilities Co. (Anderson)	6	Safety	28' 0"	C	M
Virginia:					
Danville Trac. & Pwr. Co.	2	Passenger	37' 0"	C	M
Virginia Ry. & Pwr. Co. (Richmond)	50	Safety	28' 0 1/2"	C	M
West Virginia:					
Monongahela Valley Trac. Co. (Fairmont)	8	Safety	28' 9 1/2"	C	M
	3	*Freight	30' 0"	I	M
West of the Mississippi River					
California:					
Fresno Traction Co.	12	Safety	28' 0"	C	M
Los Angeles Railway Co.	22	Safety	28' 0"	C	M
Municipal Ry. of San Francisco	1	Passenger	29' 0"	C	M
Pacific Elec. Ry. (Los Angeles)	102	Safety	28' 0 1/2"	C	M
	26	Passenger	47' 0"	I	M
Pacific Gas & Elec. Co. (Sacramento)	16	Passenger	47' 0"	I	T
	6	Safety	28' 0 1/2"	C	M
San Diego Electric Railway Co.	25	Safety	28' 0 1/2"	C	M
San Francisco, Napa & Calistoga Railway	2	Passenger	58' 0"	I	M
	* 1	Passenger	35' 0"	I	M
San Francisco-Oakland Term. Rys.	25	Safety	28' 0 1/2"	C	M
	* 18	Passenger	48' 6"	C	M
San Jose Railroads	5	Passenger	40' 8"	I	M
	22	Safety	28' 0"	C	M
Stockton Electric Railroad Co.	15	Safety	28' 0"	C	M
Colorado:					
Arkansas Valley Railway, Light & Power Co. (Pueblo)	4	Safety	27' 9 1/2"	C	M
Iowa:					
Iowa Ry. & Lt. Co. (Cedar Rapids)	6	Safety	28' 0 1/2"	C	M
Iowa Southern Utilities Co. (Centerville)	1	Safety	....	C	M
Waterloo, Cedar Falls & Northern Ry. Co.	20	Safety	28' 0 1/2"	C	M
Kansas:					
Topeka Railway Co.	8	Safety	28' 0 1/2"	C	M
Louisiana:					
Baton Rouge Electric Co.	8	Safety	28' 0"	C	M
Shreveport Railways Co.	* 3	Passenger	40' 8"	C	M
Minnesota:					
Wisconsin Railway, Light & Power Co. (Winona)	8	Safety	28' 0"	C	M
Missouri:					
Kansas City, Clay County & St. Joseph Ry. Co.	* 1	Freight	42' 0"	I	M
	3	Passenger	51' 5"	I	M
United Railways of St. Louis	10	Safety	28' 0 1/2"	C	M
	50	Passenger	45' 0"	C	M
	* 51	Passenger	50' 6"	C	M
	* 1	Work	40' 0"	C	M
Nebraska:					
Lincoln Traction Co.	15	Safety	28' 0 1/2"	C	M
Omaha & Council Bluff St. Ry.	5	Safety	28' 0 1/2"	C	M
	2	Snow Swpr.	29' 0"	C	M
Omaha, Lincoln, & Beatrice Railway Co.	2	Passenger	42' 0"	C	M
	1	Passenger	30' 0"	C	M
North Dakota:					
Grand Forks St. Railway Co.	6	Safety	27' 9 1/2"	C	M
Northern States Power Co. (Fargo)	15	Safety	27' 9 1/2"	C	M
Oklahoma:					
Pittsburgh County Railway Co. (McAlester)	2	Passenger	43' 7"	I	M
Oregon:					
Oregon & California Railroad (Salem)	4	Safety	28' 0 1/2"	C	M
	1	Safety	28' 0 1/2"	C	M
Pacific Pwr. & Lt. Co. (Astoria)	4	Safety	28' 0"	C	M
	6	Passenger	55' 10"	I	M
Southern Pacific Co. (Portland)	6	Passenger	55' 10"	I	T
South Dakota:					
Sioux Falls Traction System	3	Safety	28' 0 1/2"	C	M
Texas:					
Austin Street Railway Co.	10	Safety	28' 0 1/2"	C	M
Dallas Railway Co.	50	Safety	28' 0 1/2"	C	M
El Paso Electric Railway Co.	10	Safety	28' 0 1/2"	C	M
Houston Electric Co.	15	Safety	28' 0 1/2"	C	M
Northern Texas Traction Co. (F r t W r th)	4	Passenger	52' 0"	I	M
	35	Safety	28' 0 1/2"	C	M
San Antonio Public Service Co.	15	Safety	28' 0 1/2"	C	M
Texas Electric Ry. Co. (Dallas)	4	Passenger	56' 0"	I	M
* Built in companies' own shops. † Rebuilt. ‡ Second hand.					
Utah:					
Bamberger Electric R. R.*	1	Passenger	58' 0"	I	M
	5	Passenger	58' 0"	I	T
Salt Lake & Utah Railroad Co.	1	Express	58' 0"	I	M
	1	Express	42' 0"	I	T
Utah-Idaho Central R. R. Co.	10	Freight, Box	36' 10 1/2"	I	T
	50	Freight, Gondola	41' 9 1/2"	I	T
100	Freight	46' 2 1/2"	I	T	
Washington:					
Pacific Northwest Traction Co.	4	Freight	41' 0"	I	M
Puget Sound Power & Light Co. (Bellingham)	8	Safety	28' 0 1/2"	C	M
Canada:					
Brantford Municipal Ry., (Ont.)	2	Safety	32' 0"	C	M
	7	Passenger	61' 6"	I	M
Grand River Railway Co. (Ont.)	1	Express	61' 6"	I	M
	2	Passenger	36' 0"	C	M
Hydro-Electric Power Commission (Ont.)	12	Passenger	33' 0"	C	M
	6	Passenger	33' 0"	C	T
Lake Erie & Northern Railway Co., (Ont.)	2	Snow Swpr.	33' 0"	C	M
	3	Passenger	61' 8"	I	M
Sherbrooke Ry. & Pwr. Co. (Que.)	1	Passenger	61' 8"	I	T
	2	Safety	30' 0"	C	M
Southern Canada Power Co.	1	Safety	28' 0 1/2"	C	M
Toronto Civic Railway (Ont.)	25	Safety	28' 0 1/2"	C	M
Toronto Suburban Railway (Ont.)	2	Express	52' 0"	I	M
Winnipeg Electric Ry. Co., (Man.)	6	Snow Swpr.	28' 0"	C	M

ELECTRIC LOCOMOTIVES

	Number	Weight Tons.	Length Over All, Ft. In.
New England District:			
Rutland Railway, Light & Power Co.	1	..	..
North of the Ohio and East of the Mississippi River:			
Metropolitan West Side Elev. Ry. Co. (Ill.)	2	50	37 4
Albany Southern Railroad Co. (N. Y.)	1	..	46 6
Brooklyn Rapid Transit Co. (N. Y.)	1	..	35 6
Youngstown & Suburban Railway Co. (Ohio)	1	45	..
Monongahela Valley Traction Co.	1	..	34 0
Washington & Old Dominion Ry.	1	..	34 4 1/2
West of the Mississippi River:			
Bamberger Electric R.R. Co.	1	..	42 0
Pacific Electric Railway	2	60	..
Tidewater Southern Railway (Cal.)	1	60	..
Salt Lake & Utah Railroad Co (Utah)	3	..	31 2 1/2
Canada:			
Grand River Railway Co.	1	..	36 0
Lake Erie & Northern Railway Co.	1	..	36 0

A more detailed description of the cars ordered during the last five years is found in Table II. Referring to this table it will be noted that the railways are approaching the same number of cars as were purchased in 1916, when 3,900 cars were ordered. The rolling stock built by electric railways in their own shops has also held its own this year, having increased by only one car. The companies which built a large part of their own cars this year were the United Railways of St. Louis, which built 51 motor passenger cars, and the Chicago Surface Lines, which equaled St. Louis by constructing the same number, except that they were trailer cars. Among the larger orders for cars this year were

TABLE IV—RECAPITULATION OF CARS AND LOCOMOTIVES ORDERED—1920

	New England District	North of the Ohio and East of the Mississippi River	South of the Ohio and East of the Mississippi River	West of the Mississippi River	United States	Canada	Cuba	Total
Number of companies reporting..	20	85	15	45	165	9	1	175
Total cars and electric locomotives ordered.....	449	1,937	161	927	3,474	74	50	3,598
City Service:								
Safety cars.....	246	852	128	443	1,669	30	..	1,699
Passenger cars.....	184	448	25	126	783	14	50	847
Trailer..	1	336	..	..	337	6	..	343
Service cars.....	15	78	..	3	96	8	..	104
Total city cars.....	446	1,714	153	572	2,885	58	50	2,993
Interurban Service:								
Passenger cars { Motor.....	1	125	5	54	185	10	..	195
Trailer.....	..	4	..	27	31	1	..	32
Express and freight cars.....	1	87	3	267	358	3	..	361
Total interurban cars.....	2	217	8	348	574	14	..	588
Electric locomotives.....	1	7	..	7	15	2	..	17
Number of companies ordering safety cars.....	15	51	11	32	109	4	..	113

200 steel motor cars for the Brooklyn Rapid Transit Subway System. The first 100 of these were ordered in May and the second 100 in December, 1920. The Public Service Corporation of New Jersey placed an order for 200 safety cars and 100 trailer passenger cars 49 ft. 9 in. long. The Milwaukee Electric Railway & Light Company ordered 100 motor cars, 45 ft. long, that can be operated either by one or two men. In Baltimore the United Railways & Electric Company ordered 100 passenger trailer cars. The use of the trailer car seems to be increasing rapidly. Besides the two orders already mentioned, the Cleveland Railway ordered fifty motor and fifty trailer passenger cars.

Table I shows the details of the rolling stock ordered by the individual companies. The companies are alphabetically arranged by states and the states are grouped into districts. The cars ordered by the companies listed under the territory "North of the Ohio and East of the Mississippi River" were by far the greatest, the number being 1,947 cars, which is 54 per cent of the total rolling stock ordered.

All cars are specified as to the service for which they are intended. No attempt has been made to give details as to construction other than the over-all length. Most of the cars are either of semi-steel or all-steel construction. The day of the wooden car is past, except for freight, express or service cars.

It is practically impossible to receive replies from all electric railway companies when a definite date is set for publication. Answers to questionnaires were received from more than 700 railway companies and have been supplemented by notes previously published.

Through the courtesy and co-operation of the car builders it has been possible to check these figures furnished by the railway companies, and in some cases where the companies have failed to report the figures as furnished by the car manufacturers have been used. Hence it is believed that few cases of cars built during the year have been missed.

The ELECTRIC RAILWAY JOURNAL wishes to thank all those who co-operated in making possible the publication of this information.

Track Extensions and Reconstruction

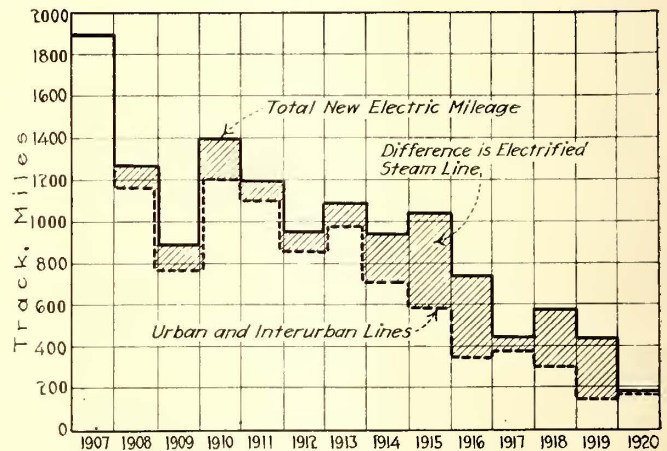
**One Hundred and Sixty-five Urban and Interurban Railway Companies Report on Track Construction—
87 Built 185 Miles of Extensions and 131 Companies Reconstructed 361 Miles of Track During
Past Year—Only 9 Miles of Steam Road Were Electrified — More New Track Was Built,
But Less Track Was Reconstructed than Last Year**

THE outlook for the electric railways in the future seems to be very favorable if the figures showing track extensions and track rebuilt by the companies during 1920 may be taken as any indication. In 1919 the track extensions were the lowest that had ever been encountered for at least fourteen years, as the summary "Comparison of Track Construction" illustrates. The number of miles of track extensions during 1920 was 185.48, and although this does not approach very closely the figure of 1918 it is at least a step in that direction. This new track represents an increase over 1919 of 36 miles in the urban and interurban lines, or an increase of 25.6 per cent.

The fact that the electrified steam railroads constructed very little track compared with last year makes the comparison of the total seem worse. According to all reports that can be found, the track that was extended by the electrified steam lines was less than 10 miles, while in 1919 for the same item 287 miles were reported.

Of the total mileage of track extensions constructed by city or interurban electric railways nearly one-third was built in New York City, the Interborough Rapid Transit Company having extended its subway mileage by 38.84 miles, while its competitor, the New York Municipal Railway Corporation, was building 14 miles of new track.

The track rebuilt has not come up to the total of last year, but this figure has not deviated enough from 1919 to mention the difference. The price of rails was so high that the electric railways have not replaced any track except where it was absolutely necessary to do so. Both the extensions and the rebuilt track seem to show that it has been the policy not to extend or rebuild any track unless required by city paving contracts or where absolutely necessary on account of traffic conditions.



THIS CHART SHOWS MILES OF NEW TRACK BUILT EACH YEAR SINCE 1907

In the accompanying table is given the single-track mileage built by urban and interurban railways during 1920. This table was prepared from questionnaires which were sent to approximately 800 companies and which were returned by more than 700. The majority

COMPARISON OF TRACK CONSTRUCTION

Year	No. of Cos.	Extensions		Electrified Steam Lines	Total	Track Rebuilt
		Urban Track	Interurban Track			
1907	(a)	(a)	(a)		1,880.00	(a)
1908	157			84.00	1,258.50	(a)
1909	160	1,174.5		112.40	887.16	(a)
1910	217	774.7		192.40	1,397.20	(a)
1911	223	1,204.8		86.50	1,191.50	(a)
1912	171	1,105.0		80.80	950.20	(a)
1913	181	869.4		119.00	1,093.90	(a)
1914	163	974.9		229.00	946.40	(a)
1915	136	716.5		448.20	1,044.20	(a)
1916	104	596.0		388.00	744.30	(a)
1917	121	115.40	240.90	66.00	442.70	375.40
1918	80	251.10	125.60	275.70	589.53	155.43
1919	73	216.41	97.41	287.60	428.17	390.64
1920	87	110.90	29.67	8.92	185.48	361.77
		145.69	30.87			

(a) Not available.

TRACK EXTENSIONS AND TRACK REBUILT DURING 1920

New England District		
	Extensions	Rebuilt
Connecticut:		
The Connecticut Co. (New Haven).....	0.46	5.07
Maine:		
Androscoggin & Kennebec Ry. Co. (Lewiston).....	0.00	1.90
Bangor Railway & Electric Co.....	0.00	5.00
Cumberland County Ry. & Lt. Co. (Portland).....	0.00	4.21
Fairfield & Shawmut Railway.....	0.00	0.25
Knox County Electric Co. (Rockland).....	0.00	6.00
Somerset Traction Co. (Skowhegan).....	0.00	1.00
Massachusetts:		
Boston Elevated Railway Co.....	0.30	18.30
Brockton & Plymouth St. Ry. Co.....	0.00	4.00
Massachusetts N. rtheastern St. Ry. Co.....	0.00	6.00
Springfield Street Railway Co.....	6.92	5.09
Union Street Railway.....	0.01	0.39
Worcester Consolidated St. Ry. Co.....	0.41	3.90
Rhode Island:		
The Rhode Island Co. (Providence).....	0.00	3.16
Vermont:		
Rutland Railway Light & Power Co.....	0.50	0.12

North of Ohio and East of the Mississippi River		
	Extensions	Rebuilt
District of Columbia:		
Capital Traction Co.....	0.00	1.74
City & Suburban Railway Co.....	0.00	0.27
Washington & Old Dominion Ry.....	0.10	1.00
Washington Railway & Electric Co.....	0.00	1.33
Illinois:		
Alton, Granite & St. Louis Trac. Co.....	0.00	1.63
Aurora, Plainfield & Joliet R. R. Co.....	0.00	1.00
Calumet & So. Chicago Railway Co.....	0.00	0.04
Chicago City Railway Co.....	0.00	0.06
Chicago Elevated Railways.....	0.00	10.44
Chicago & Interurban Trac. Co.....	0.00	0.80
Chicago & Joliet Electric Railway Co.....	0.00	2.03
Chicago, North Shore & Milwaukee R. R. (Highwood).....	0.00	1.83
Chicago Railways Company.....	0.92	2.06
East St. Louis Railway Co.....	0.00	2.37
East St. Louis & Suburban Railway Co.....	0.00	1.87
Evanston Railway Co.....	0.00	2.50
Fox & Illinois Union Railway (Aurora).....	0.00	0.17
Hammond, Whiting & E. Chicago Ry. Co.....	0.00	2.00

Indiana:		
Chicago, South Bend & Northern Ind. Ry. Co.....	0.50	0.38
Indiana Railways & Light Co. (Kokomo).....	0.19	0.00
Indiana Service Corporation (Fort Wayne).....	1.00	1.42
Interstate Public Service Co. (Indianapolis).....	3.33	0.00
Public Utilities Co. (Evansville).....	0.00	2.50
Union Traction Co. of Indiana (Anderson).....	0.62	1.34

Maryland:		
United Railways & Light Co. of Baltimore.....	3.50	13.50

Michigan:		
Grand Rapids Railway Co.....	0.04	1.70

New Jersey:		
Trenton & Mercer County Trac. Co.....	1.10	0.31

New York:		
Black River Traction Co. (Watertown).....	0.00	0.25
Brooklyn City Railroad Co.....	0.00	0.08
Brooklyn Rapid Transit Co. (Surface Lines).....	0.00	0.97
Buffalo & Lake Erie Traction Co.....	0.53	1.01
Cortland County Traction Co.....	0.00	0.49
Elmira Water, Light & R. R. Co.....	0.00	1.00
Empire State Railroad Corporation.....	0.00	0.50
Hudson Valley Ry. Co. (Glens Falls).....	0.25	0.41
Interborough Rapid Transit Co.....	38.84	0.00
International Railway (Buffalo).....	0.25	2.60
New York Municipal Ry. Corp. (Subway).....	14.00	0.00
New York State Railways.....	1.02	3.77
New York, Westchester & Boston Railway Co.....	1.63	0.00
Ogdensburg Street Railway Co.....	0.00	0.50
Poughkeepsie & Wappingers Falls Ry. Co.....	0.00	1.36
Waverley, Sayre & Athens Traction Co.....	0.00	0.74

Ohio:		
Cincinnati Traction Co.....	1.15	3.64
Dayton & Troy Electric Railway Co.....	0.23	0.42
Ohio Traction Co.....	0.07	2.88
Pennsylvania-Ohio Electric Co. (Youngstown).....	0.00	3.06
Richland Public Service Co.....	0.00	1.00
Springfield Railway Co.....	0.00	1.00
Toledo, Bowling Green & Southern Traction Co.....	0.00	20.00
Toledo, Fostoria & Findlay Railway Co.....	0.00	10.00
Toledo Railways & Light Co.....	2.00	0.00
Youngstown Municipal Railway.....	0.00	0.76

Pennsylvania:		
Altoona & Logan Valley Electric Ry. Co.....	0.51	0.55
Blue Ridge Traction Co. (Danville).....	6.80	0.00
Conestoga Traction Co. (Lancaster).....	0.00	0.75
Eastern Pennsylvania Railways Co. (Pottsville).....	0.00	1.00
Frankford, Tacony & Holmesburg St. Ry. Co. (Phila.).....	0.00	3.00
Harrisburg Railways Co.....	0.61	0.66
Hershey Transit Co.....	0.00	15.00
Indiana County Street Ry. Co.....	0.00	15.00
North Branch Transit Co.....	0.15	0.55
Pittsburgh Railways Co.....	0.00	25.32
Reading Transit & Light Co.....	0.00	0.99
Trenton, Bristol & Philadelphia St. Ry. Co.....	0.00	1.00
West Chester Street Railway Co.....	0.00	1.00
West Penn Railway.....	0.00	2.00
Wilkes-Barre Railway Co.....	0.50	0.00
York Railways Co.....	0.00	2.30

Wisconsin:		
Madison Railways Co.....	0.82	0.00
Milwaukee Electric Railway & Light Co.....	3.48	6.75
Wisconsin Valley Electric Co.....	0.92	1.00

South of the Ohio and East of the Mississippi River		
	Extensions	Rebuilt
Alabama:		
Birmingham Ry., Lt. & Pwr. Co.....	1.31	0.00
Florida:		
Tampa Electric Co.....	0.22	0.00
Georgia:		
Georgia Railway & Power Co (Atlanta).....	0.84	2.59
North Carolina:		
Durham Traction Co.....	0.22	0.84
Raleigh Street Railway Co.....	0.23	0.00
South Carolina:		
Charleston Consolidated Ry. & Ltg. Co.....	0.24	2.00
Tennessee:		
Memphis Street Railway Co.....	0.33	2.60
Nashville Railway & Light Co.....	0.00	3.00
Virginia:		
Darville Traction & Power Co.....	0.29	0.73
Newport News & Hampton Railway, Gas & Electric Co.....	0.00	0.95
Virginia Railway & Power Co. (Richmond).....	1.95	2.50
West Virginia:		
Charleston Interurban Railroad Co.....	1.50	1.00
Monongahela Valley Traction Co. (Fairmont).....	0.60	0.79
Ohio Valley Electric Railway Co. (Huntington).....	0.00	0.71
Wheeling Traction Co.....	0.00	0.32

West of the Mississippi River		
	Extensions	Rebuilt
Arkansas:		
Fort Smith Light & Traction Co.....	0.00	0.50
California:		
Humbolt Transit Co. (Eureka).....	0.44	0.00
Los Angeles Railway Corporation.....	4.75	0.00
Pacific Gas & Electric Co. (Sacramento).....	0.00	1.00
Petaluma & Santa Rosa R. R. Co.....	0.25	0.00
Sacramento Northern Railroad.....	2.07	0.00
San Francisco, Napa & Calistoga Railway Co.....	2.00	0.00
San Francisco-Oakland Terminal Railways.....	1.12	0.50
Visalia Electric Railroad Co. (Exeter).....	0.00	1.50
Colorado:		
Arkansas Valley Ry., Lt. & Power Co. (Pueblo).....	0.00	2.50
Denver & Intermountain Railroad Co.....	0.00	0.83
Denver Tramway Co.....	0.45	4.54

Iowa:		
Albia Light & Ry. Co.....	0.00	0.94
Clinton, Davenport & Muscatine Railway Co.....	0.50	0.00
Mississippi Valley Electric Co. (Iowa City).....	0.00	0.68
Tri-City Railway Co.....	0.11	0.62

Kansas:		
Arkansas Valley Interurban Ry. Co. (Wichita).....	4.00	0.00
Kansas City, Leavenworth & Western Ry. Co.....	0.00	4.00

Minnesota:		
Duluth Street Railway Co.....	1.99	3.24
Twin City Rapid Transit Co. (Minneapolis).....	14.07	1.18
Wisconsin Ry., Lt. & Power Co. (Winona).....	0.85	0.65

Missouri:		
City Light & Traction Co. (Sedalia).....	1.50	0.00
Kansas City, Lawrence & Topeka El. R. R. Co.....	0.00	3.50
Kansas City Railways Co.....	3.53	3.15
St. Joseph Railway Light Heat & Power Co.....	0.00	3.10
United Railways Company of St. Louis.....	0.15	22.87

Nebraska:		
Lincoln Traction Co.....	0.00	0.94
Omaha & Council Bluffs St. Ry. Co.....	1.00	1.50
Omaha, Lincoln & Beatrice Ry. Co. (Lincoln).....	0.19	0.38

North Dakota:		
Capitol Street Car Line.....	0.00	0.50
Northern States Power Co. (Fargo).....	0.00	0.68

Oklahoma:		
Chickasha Street Railway Co.....	0.50	0.00
Enid City Railway Co.....	0.00	0.53

Oregon:		
Portland Railway, Light & Power Co.....	0.00	1.10

South Dakota:		
Sioux Falls Traction System.....	0.33	0.00

Texas:		
Dallas Railway Co.....	3.60	3.60
Galveston Electric Co.....	0.00	1.00
Northern Texas Traction Co.....	4.94	1.42

Utah:		
Utah-Idaho Central R. R. Co.....	0.00	4.50

Washington:		
Gray's Harbor Railway & Light Co.....	0.00	1.04
North Coast Power Co. (Vancouver).....	0.00	0.50
Puget Sound International Ry. & Power Co. (Everett).....	0.27	0.00
Puget Sound Power & Light Co. (Bellingham).....	0.36	0.00
Seattle Municipal Street Railway.....	1.87	0.00
Seattle & Rainier Valley Railway Co.....	0.00	0.38
Washington Water Power Co. (Vancouver).....	0.00	0.50

Canada		
	Extensions	Rebuilt
British Columbia El. Ry. Co., Ltd.....	2.04	0.00
Cape Breton Electric Co., Ltd.....	0.34	0.24
Grand River Railway.....	5.69	0.00
Kitchener & Waterloo Street Railway.....	0.91	0.00
Lewis County Railway.....	0.00	2.00
London & Port Stanley Railway.....	3.20	0.00
Montreal Tramways Co.....	1.54	6.65

Canada (Continued)

	Extensions	Rebuilt
Moose Jaw Electric Railway Co., Ltd.	1.00	4.00
New Brunswick Power Co.	1.00	1.75
Nova Scotia Tramways & Power Co., Ltd.	1.12	0.00
Peterboro Radial Railway	0.00	0.45
Quebec Railway, Light & Power Co.	0.58	0.00
Regina Municipal Railway (Spur track)	0.26	0.00
Sarnia Street Railway Co., Ltd.	0.00	1.00
Saskatoon Municipal Railway	0.57	0.00
Sherbrooke Railway & Power Co.	1.14	0.00
Toronto Civic Railway	0.94	0.00
Winnipeg Electric Railway Co.	0.61	2.08

SUMMARY OF TRACK CONSTRUCTION—1920

TRACK EXTENSIONS	New England District	North of the Ohio and East of the Mississippi River	South of the Ohio and East of the Mississippi River	West of the Mississippi River	Total United States	Canada	Total
Number of companies...	5	30	11	25	71	16	87
Miles of track:							
Urban.....	8.09	75.62	5.39	37.96	127.06	18.63	145.69
Interurban.....	0.50	12.54	2.34	11.08	26.46	4.41	30.87
Total track extended...	8.59	88.16	7.73	49.04	153.52	23.04	176.56
TRACK RECONSTRUCTION							
Urban and Interurban Lines:							
Number of companies...	15	63	12	33	123	8	131
Miles of track:							
Urban.....	42.58	114.35	16.04	55.06	227.64	18.18	246.21
Interurban.....	21.81	73.23	2.00	18.52	115.56	.....	115.56
Total track rebuilt....	64.39	187.58	18.04	73.58	343.59	18.18	361.77

of these companies reported no extensions or rebuilt track except the usual maintenance. There were 87 companies which reported a total of 185.48 miles extended, 78.5 per cent of which was built as city track and 16.7 per cent was built as interurban track. The remaining 4.8 per cent covers the electrified steam railroad which was extended.

The statistics in this main table are reported for individual companies which have been arranged by states, which in turn have been geographically arranged into five districts. As the greater proportion of the companies are in the district "North of the Ohio and East of the Mississippi River" it is not unusual that this district should be first in the amount of track extended or rebuilt, both urban and interurban. Again, as last year, New York State has the largest number of miles of track extended, with 54.02 miles city track and 2.60 interurban, or a total of 56.62 miles. The larger proportion of this mileage, amounting to 52.84 miles, is in New York subways. Only about 6.7 per cent of the total was extended by all the other companies in the state. Minnesota ranks next to New York, with 15.11 miles of

ELECTRIFIED STEAM LINES

	Extensions	Rebuilt
New York, New Haven & Hartford R. R. (yard at Cedar Hill and New Haven)	8.92	0.00

extensions. The largest track extension by any company other than the New York subways was reported in Minnesota by the Twin City Rapid Transit Company, with a city extension of 13.28 miles. Only three other companies reported four or more miles of track extensions.

The largest amount of track rebuilt in any state was in Pennsylvania, where fourteen companies reconstructed 69.12 miles. Ohio was next, with 42.76 miles. The two states having the largest mileage rebuilt come in the same geographical section, thereby making this section, which is the same one referred to as being the first in track extensions, the banner district in track rebuilt.

The largest amount of track rebuilt by any one company during the year was by the Pittsburgh Railways Company, with 19.77 miles of city track and 5.55 miles of interurban track. Other companies reconstructing mileage above the average were United Railways & Electric Company of Baltimore, Boston Elevated Railway, United Railways of St. Louis, and the Toledo, Bowling Green & Southern Traction Company, with 13.50, 18.50, 22.87 and 20 miles respectively. There were four other companies which rebuilt more than 10 miles.

The only electrification of steam railroads that can be accounted for is 8.92 miles of new track constructed by the New York, New Haven & Hartford in and around the new classification yards at Cedar Hill, Conn., and in other yards at New Haven, Conn.

Fifteen companies from Canada, or about one-fifth of the total companies reporting extensions, constructed new track consisting of 21 miles, or about 12 per cent of the total.

An attempt has been made to determine the plans of the electric railways for the coming year, and as far as can be estimated from their replies they expect to construct in new track about 65 miles, and intend to rebuild at least 340 miles.

Professor Sheldon's Memory Honored

ON NOV. 17 impressive exercises in memory of the late Prof. Samuel Sheldon were held in New York at the Engineering Societies' Building. Addresses were made by Dr. A. E. Kennelly, professor of electrical engineering Harvard University and Massachusetts Institute of Technology; W. N. Dickinson, president New York Electrical Society; W. H. Nichols, chairman board of trustees Brooklyn Polytechnic Institute; T. C. Martin, secretary National Electric Light Association, and Dr. C. O. Mailloux, consulting engineer.

The work done as a teacher and engineer by Dr. Sheldon during the more than thirty years of his connection with the B. P. I. was discussed by several speakers, and tributes were paid to his excellence in these fields as well as to his friendly qualities. A plan for a permanent memorial was outlined, a committee to this end with Mr. Martin as chairman having already been formed. This committee has since met and made provision for a general appeal for funds. One subscription of \$1,000 was announced.

Street Railway Problem in New Orleans

IN A recent issue of the Association of Commerce *News Bulletin*, New Orleans, La., Leigh Carroll, chairman Civic Bureau New Orleans Association of Commerce, presents a statement on "The Street Railway Problem or Situation in New Orleans."

Mr. Carroll starts with the statement that "New Orleans needs a new railway system!" and then goes on to analyze the present inadequacies of service in New Orleans. He points out the limitations under which the local railways have been forced to operate for the past several years and shows the antiquated provisions of the franchises, the inadequate rate and other deficiencies of authority or opportunity for the railway really to serve the community.

He concludes by stating that the time is at hand when New Orleans must "get busy," for the whole community is suffering because adequate transportation facilities have not been allowed to develop.

Electric Railway Receiverships

Fewer Receiverships Occurred in 1920 than in Preceding Year—Only Two Large Urban Properties Are Added to the List of Bankrupts—Higher Fares and Business Prosperity Save Many from Such Serious Difficulties for the Time Being—Large Abandonments of Unprofitable Track and Service Are Indicated

A SLIGHTLY happier year for the street railways as a whole is indicated for the year 1920 by a smaller addition to the total number of receiverships reported, as compared with the previous year. The stimulated condition of business as a whole, resulting in increased patronage for the traction companies, together

The tables do not include certain companies that were sold at foreclosure for reorganization purposes only without the intervention of a receiver. So far as known there are three companies in this class, namely, the Kansas City-Western Railway; the Oakland, Antioch and Eastern Railway and the Norfolk & Bristol Street Railway.

TABLE I—RECORD OF ELECTRIC RAILWAY RECEIVERSHIPS

Year	Number of Companies	Miles of Single Track Involved	Outstanding Stock	Securities Bonds
1909.....	22	558.00	\$29,962,200	\$22,325,000
1910.....	11	696.61	12,629,400	75,490,735
1911.....	19	518.90	29,533,450	38,973,293
1912.....	26	373.58	20,410,700	11,133,800
1913.....	18	342.84	31,006,900	47,272,200
1914.....	10	362.39	35,562,550	19,050,460
1915.....	27	1,152.10	40,298,050	39,372,375
1916.....	15	359.26	14,476,600	10,849,200
1917.....	21	1,177.32	33,918,725	33,778,400
1918.....	29	2,017.61	92,130,388	163,257,102
1919.....	48	3,781.12	221,259,354	312,915,104
1920.....	16	992.11	25,313,655	68,860,575

TABLE II—RECORD OF ELECTRIC RAILWAY FORECLOSURE SALES

Year	Number of Companies	Miles of Track Involved	Outstanding Stock	Securities Bonds	Receiver's Certificates
1909.....	21	488.00	\$22,265,700	\$21,174,000	(a)
1910.....	22	724.36	19,106,613	26,374,075	(a)
1911.....	25	660.72	91,354,800	115,092,750	(a)
1912.....	18	267.18	14,197,300	10,685,250	(a)
1913.....	17	302.28	15,243,700	19,094,500	(a)
1914.....	11	181.26	26,239,700	44,094,241	(a)
1915.....	19	308.31	30,508,817	16,759,997	(a)
1916.....	19	430.14	13,895,400	22,702,300	(a)
1917.....	26	745.19	27,281,900	27,313,045	(a)
1918.....	23	524.22	37,740,325	20,149,384	(a)
1919.....	28	2,625.48	83,893,400	75,736,738	\$42,300
1920.....	11	224.20	6,182,400	9,315,528	52,000

(a) Not available.

with the generally increased rates of fare, saved many companies from bankruptcy during the year just passed. It should be noted further, that the drastic conditions of war times succeeded in either wiping out or causing the complete re-organization of many of the weaker companies so that as a whole the industry was in a stronger position in 1920. However, there are no cases reported of receivers being discharged without foreclosure or re-organization, all the companies reported as being in receivership on Dec. 31, 1919, either remaining under

An interesting feature of the year just passed is the continuation of the process of dismemberment of some of the very large companies, which in the early days of the industry drew a number of the smaller independent lines together into unified operating systems either by stock control or long-term leases. It has been the customary and generally accepted belief that such mergers would result in increased net earnings by means of greater operating efficiency and the elimination of duplicated management expenses and competing service.

TABLE III—ELECTRIC RAILWAY RECEIVERSHIPS—1920

(Listed alphabetically by States)

	Miles
Denver (Col.) Tramways.....	227.45
Pensacola (Fla.) Electric Co.....	21.70
Caldwell (Id.) Traction Co.....	11.40
Alton (Ill.) Granite & St. Louis Traction Co.....	62.00
Kansas City (Mo.) Railways.....	311.50
Richmond Lt. & R.R. Co. (Staten Island, N. Y.).....	32.05
Staten Island (N. Y.) Midland Ry.....	28.68
Shore Line Electric R.R. (White Plains, N. Y.).....	1.46
Westchester St. R.R. of White Plains, N. Y.....	20.98
Western New York & Penn. Trac. Co. (Olean, N. Y.).....	100.00
Ashtabula (O.) Rapid Transit Co.....	5.50
Cleveland, Alliance & Mahoning Valley R.R. (Ravenna, O.).....	46.00
Cleveland & Erie Ry. (Girard, Pa.).....	30.00
Rhode Island Suburban Ry. (Providence).....	75.39
Bryan (Tex.) & Colleg. Interurban Ry.....	7.75
Barre & Montpelier (Vt.) Trac. & Power Co.....	10.25
Total for 1920 (16 Cos.).....	992.11

TABLE IV—ABANDONMENTS—ENTIRE—1920

(Includes only companies whose entire traction property has been dismantled or permanently abandoned and not likely to resume operations)

	Miles	Stock	Bonds
Colorado Springs (Col.), Cripple Creek District Ry. (Electric Div.).....	18.50	(b) 2,000,000	(b) 2,827,878
Durango (Colo.) Ry. & Realty Co.....	2.50	(a)	(a)
Blue Hill St. Ry. (Canton, Mass.).....	19.50	300,000	250,000
Norwood, Canton & Sharon (Mass.) St. Ry.....	6.20	(a)	(a)
Plymouth (Mass.) & Sandwich St. Ry.....	6.40	151,800	None
Norfolk & Bristol St. Ry. (Foxboro).....	21.74	200,000	189,000
Columbus (Miss.) Ry. Lt. & Power Co.....	(c) 6.80	()	()
Southern Ry. & Lt. Co. (Natchez, Miss.).....	(d) 6.00	()	()
N. Y. & North Shore Trac. Co. (Roslyn).....	38.12	979,350	800,000
Penn. Central Ry. Co. (Johnstown).....	7.50	250,000	.....
Cincinnati (O.) & Columbus Trac. Co.....	53.00	(a)	(a)
Cumberland Ry. Co. (Carlisle, Pa.).....	11.00	350,000	404,700
Providence (R. I.) & Danielson Ry. Co.....	38.00	1,000,000	600,000
Sea View R.R. (Wakefield, R. I.).....	20.90	700,000	600,000
Greenville (Tex.) Ry. & Lt. Co.....	8.00	300,000	300,000
Longview (Tex.) & Junction St. Ry.....	1.00	(a)	(a)
Mineral Hts. St. Ry. (Greenville, Tex.).....	2.75	(a)	(a)
Total for 1920 (16 companies).....	267.91	6,231,150	5,971,578

(a) Not available.

(b) Covers capitalization of entire property.

(c) Line between North Scituate, R. I., and East Killingly already dismantled, balance will be torn up unless saved by local communities.

(d) Railway department only is abandoned. Company still continues light and power business.

the jurisdiction of the courts or else undergoing some drastic reorganization.

During 1920, sixteen additional companies passed into the hands of receivers, while ten were sold at foreclosure, re-organized, or wholly abandoned as an aftermath of the receivership. The mileage of the companies newly involved in receiverships is 992.11, only two large companies, the Kansas City Railways with 311.50 miles and the Denver Tramways with 227.45 miles, being included, whereas in 1919 a number of important systems were included, such as the Rhode Island Company, New York Railways, United Railways of St. Louis, and New Orleans Railway & Light Company.

The failure of the merger, when failure has resulted, may be ascribed to various causes, but it is certain that part of the trouble has been due to including in such mergers, many weak lines operating through territory where the traffic was never sufficient to justify operation as a paying proposition. This dismemberment feature is noted in such companies as the New York Railways, which in 1919 returned to the original owners the Eighth

TABLE V—ELECTRIC RAILWAY RECEIVERSHIPS AND FORECLOSURES AS OF DEC. 31, 1920

	Year of Receivership	Miles of Single Track Involved	Outstanding Securities		
			Capital Stock	Funded Debt	Receivers' Certificates
New England District					
Connecticut					
Danbury (Ct.) & Bethel St. Ry.	1917	16.00	\$320,000	\$588,500	\$60,000
Hartford & Springfield St. Ry. (Warehouse Point)	1918	48.00	785,000	961,000	None
Shore Line Electric Ry. (c)	1919	74.17	1,000,000	6,700,000	None
Maine					
Atlantic Shore Ry. (Kennebunk)	1915	49.93	1,000,000	1,746,250	None
Massachusetts					
Plymouth (Mass.) & Sandwich St. Ry. (a)	1918	6.40	151,800	None	None
B've Hill St. Ry. (Canton) (a)	1919	19.70	300,000	250,000	2,000
Brookton & Plymouth (Mass.) St. Ry.	1919	22.00	250,000	260,000	None
New Hampshire					
Portsmouth, Dover (N. H.) & York St. Ry.	1917	42.33	(i)	707,000	20,000
Rhode Island					
Bay State St. Ry. (Newport Div.) (b)	1917	22.20	(b)	996,800	None
Rhode Island Co. (Providence) ()	1919	101.15	9,685,500	1,662,200	None
United Traction & Electric Co.	1919	289.93	8,000,000	9,000,000	None
Rhode Island Suburban Ry. (Providence, R. I.)	1920	75.39	5,000,000	4,708,000	None
Vermont					
Springfield (Vt.) Elec. Ry.	1918	9.00	100,800	100,000	22,323
Barre & Montpelier (Vt.) Traction & Pwr. Co.	1920	10.25	(k) 2,337,000	(k) 1,986,300	None
Summary					
Total 1/1/20	11 cos.	842.54	\$21,343,100	\$22,711,500	\$107,323
Net changes and corrections	1 cos.	141.63	250,000	260,000	3,000
Receiverships added during 1920	2 cos.	85.64	7,337,000	6,694,300	.....
Less those sold or reorganized during 1920	2 c e.	25.90	151,800	250,000	2,000
Net receiverships 12/31/20	12 cos.	760.65	28,478,300	29,415,800	102,323
North of the Ohio and East of the Mississippi River					
Illinois					
Chicago (Ill.) & Oak Park Elevated R.R.	1911	20.97	10,000,000	6,537,000	1,645,000
Chicago, Aurora (Ill.) & De Kalb R.R.	1916	30.20	950,000	427,500	None
Galesburg & Western R.R. (Rock Island) (a)	1919	16.00	500,000	521,000	None
Aurora, Elgin & Chicago (Wheaton) R.R.	1919	168.00	6,200,000	8,371,000	None
Alton (Ill.) Granite & St. Louis Traction Co.	1920	62.00	3,189,000	3,000,000	None
Indiana					
Winona Interurban Ry. Co. (Warsaw)	1916	70.00	750,000	2,343,700	None
Beech Grove (Ind.) Traction Co.	1917	3.90	150,000	100,000	None
Vincennes (Ind.) Traction Co.	1919	7.50	350,000	235,000	50,000
Michigan					
Marquette City & Presque Isle (Mich.) Ry. (d)	1912	6.00	200,000	100,000	None
New Jersey					
North Jersey Rapid Transit Co. (Hohokus)	1912	18.00	800,000	800,000	None
Atlantic City (N. J.) & Shore R.R. Co.	1915	49.89	1,000,000	950,000	None
Monmouth County Elec. Co. (Red Bank) (d)	1916	18.50	350,000	500,000	17,500
New York					
Second Ave. R.R. (New York City)	1908	30.02	1,862,000	5,631,000	3,140,000
Rochester (N. Y.) Corning & Elmira Trac. Co. (j)	1912	(j) 6.00	271,000	1,000,000	None
Buffalo (N. Y.) & Lake Erie Traction Co. (h)	1915	168.00	7,500,000	7,066,000	960,000
Hornell (N. Y.) Traction Co. (d)	1917	10.90	117,900	150,000	25,000
Manhattan & Queens Trac. Co. (Long Isl. City)	1917	21.20	(x) 20,000	(x) 2,196,000	None
Binghamton (N. Y.) Ry. Co.	1918	49.74	978,995	2,390,000	40,000
Buffalo (N. Y.) & Depew Ry.	1918	13.59	305,000	350,000	60,000
Penn Yan (N. Y.) & Lake Shore Ry.	1918	8.50	94,000	100,000	6,000
Brooklyn (N. Y.) Rapid Transit Co.	1918 (Holding Co.)	(l) 87,788,268	(l) 87,788,268	(l) 126,107,477	18,000,000
New York Consolidated Ry.	1918	141.68	18,900,000	22,967,000	5,000,000
New York Municipal Ry. Corp.	1918	67.82	2,000,000	60,000,000	13,000,000
Surface Lines:					
Brooklyn Heights R.R.	1919	36.60	2,000,000	(n) 8,242,174	None
Brooklyn, Queen's County & Suburban R.R.	1919	61.92	2,000,000	(n) 9,256,710	None
Nassau Electric Ry.	1919	144.39	15,000,000	(n) 20,787,115	None
Coney Island & Brooklyn Ry.	1919	59.53	2,983,900	(n) 6,223,298	None
Interboro Consolidated Corp.	1919 (Holding Co.)	(p) 50,403,634	(p) 50,403,634	(p) 67,825,000	None
New York (N. Y.) Railways Co.	1919	(p) 97.72	(p) 22,081,760	(p) 53,122,483	None
Richmond Lt. & R.R. Co. (Staten Island)	1920	32.05	(f) 1,932,000	(f) 1,482,000	None
Staten Island (N. Y.) Midland Ry. Co.	1920	28.68	1,000,000	1,000,000	None
Western New York & Penn. Trac. Co. (Olean)	1920	100.00	1,599,355	2,492,000	None
Westernchester St. R.R. of White Plains	1920	20.98	700,000	168,000	34,800
Shore Line Elec. R.R. (White Plains)	1920	1.46	50,000	None	None
Ohio					
Sandusky, Norwalk (O.) & Mansfield Elec. Ry.	1912	33.00	600,000	600,000	None
Cincinnati (O.), Lawrenceburg & Aurora Elec. St. Ry.	1913	31.89	808,900	750,000	None
Interurban Ry. & Terminal Co. (Cincinnati)	1914	41.03	3,500,000	1,650,000	49,000
Plymouth & Shelby Trac. Co. (d)	1917	6.97	200,000	200,000	None
Ohio River Elec. Ry. (Pomeroy)	1919	12.70	300,000	315,000	None
Springfield (O.) Term. Ry. & Power Co. (a)	1919	33.00	350,000	250,000	None
Cleveland, Alliance & Mahoning Valley R.R.	1920	46.00	1,100,000	1,100,000	None
Ashtabula (O.) Rapid Transit Co.	1920	5.50	500,000	382,000	.....
Pennsylvania					
Philadelphia & Easton Elec. Ry. (Doylestown)	1912	31.00	612,600	911,000	None
Sunbury (Pa.) & Susquehanna Ry. (d)	1913	9.20	600,000	640,000	None
North Branch Transit Co. (Bloomsburg) (d)	1915	30.00	500,000	532,500	None
Buffalo & Lackawanna Trac. Co. (Erie)	1918	8.80	55,000	1,000,000	None
Cumberland Ry. Co. (Carlisle) (a)	1918	11.00	350,000	404,700	None
Pittsburgh (Pa.) Railways	1918	605.25	21,726,750	41,579,500	None
Scranton (Pa.) & Binghamton Ry. (d)	1918	50.00	6,000,000	4,100,000	.....
Philadelphia (Pa.) Rys. Co.	1919	16.00	400,000	400,000	None
Penn. Central Ry. Co. (Johnstown) (i)	1919	7.50	250,000	.....	.....
Northampton Traction Co. (Easton)	1919	21.00	500,000	1,009,000	5,000
Northampton, Easton (Pa.) & Wash. Trac. Co.	1919	17.80	1,250,000	739,000	None
Cleveland & Erie Ry. (Girard)	1920	30.00	300,000	1,000,000	None
Summary					
Total 1/1/20	44 cos.	2,379.17	\$138,317,549	\$288,415,735	\$24,245,500
Net changes and corrections	.....	81.82	2,860,544	516,000	297,000
Receiverships added during 1920	9 cos.	326.67	10,370,355	10,624,000	34,800
Less those sold or reorganized during 1920	1/4 cos.	6.750	1,450,000	1,175,700	.....
Net receiverships 12/31/20	49 cos.	2,556.52	144,387,360	297,348,035	23,983,300

and Ninth Avenue lines, and in 1920, the Fourth Avenue line (New York & Harlem Railroad). The Rhode Island Company has turned back several leased properties, and the Shore Line Electric Railway of Connecticut has done the same. In the last named case, the receiver is now operating only 74 miles out of an original system of 246 miles, the balance having been returned to the original owners or abandoned. In some instances, the lines so severed from the bankrupt company are being operated successfully as individual units. In other cases after spasmodic attempts at operation, they have gone to the scrap dealer.

The tabulation of receiverships does not portray the entire situation in its full seriousness, as there are a number of companies whose bond interest is in default, and which are only permitted to continue without the intervention of a receivership due to the leniency of the bondholders or other creditors who have faith in a better future.

The statistics are presented in the usual way. Tables I and II give a summary of receiverships and foreclosures, respectively, by years from 1909 to date. The table of foreclosures includes all those companies which have been entirely reorganized or sold to the junk dealer, whether through actual process of foreclosure by the court or otherwise. The figures for 1919 do not in all cases agree with those published a year ago in the ELECTRIC RAILWAY JOURNAL of Jan. 3, 1920, due to additional and corrected information which has been received during this past year.

Table III is a separate list of the 1920 receiverships given to bring out these items more clearly than is done in the general tabulation. They will be found included in greater detail in Table IV, which shows the existing conditions, including all properties in receiver's hands at any time during 1920 as far as could be determined. Every effort has been made to get these statistics confirmed by

correspondence with the companies in question, but where replies could not be obtained the data have been taken from financial papers and other sources believed to be reliable.

In some cases, additional or corrected information has been received concerning the figures published a year ago in the ELECTRIC RAILWAY JOURNAL. To bring the statistics up to date, a line showing net changes has been added to the summaries for each group as well as in the recapitulation summary in Table V.

Two companies not heretofore included have been added, namely, the Charlotte (N. C.) Rapid Transit Co. with 2 miles of track and \$75,000 capital stock, and the Brockton & Plymouth (Mass.) Street Railway Co. with 22

miles of track, \$250,000 capital stock and \$260,000 bonds. This record shows that after adding the new receiverships occurring during the year, and deducting the companies foreclosed, reorganized or wholly abandoned, there remain in receivership at the close of the year 91 companies with 5,330.25 miles of track, representing about 11 per cent of the total street railway mileage of the United States. So far as has been learned, there are no Canadian companies in receivership.

TABLE V—ELECTRIC RAILWAY RECEIVERSHIPS AND FORECLOSURES AS OF DEC. 31, 1920

		Continued		Outstanding Securities		
		Year of Receivership	Miles of Track Involved	Capital Stock	Funded Debt	Receivers' Certificates
South of the Ohio and East of the Mississippi River						
Alabama						
	Birmingham (Ala.) T'edewater Ry.....	1919	32.80	\$325,000	\$1,500,000	\$12,000
	Birmingham (Ala.) Ry. Lt. & Power Co.....	1919	154.96	(r) 4,230,000	(r) 8,820,000	363,000
	Montgomery (Ala.) Lt. & Traction Co.....	1919	38.00	(k) 2,000,000	(k) 1,430,000	(k) 250,000
	North Alabama Traction Co. (Albany) (d).....	1919	7.63	75,000	225,000	.....
Florida						
	Jacksonville (Fla.) Traction Co.....	1919	64.10	1,500,000	(y) 2,034,500	65,000
	Pensacola (Fla.) Electric Co.....	1920	21.70	(k) 1,100,000	(ky) 1,789,900	(k) 25,000
Georgia						
	City & Suburban Ry. Co. (Brunswick).....	1919	9.50	100,000	194,000	None
	Savannah (Ga.) Elec. Co.....	1919	57.72	(k) 3,500,000	(ky) 6,074,376	None
Mississippi						
	Jackson (Miss.) Lt. & Trac. Co.....	1919	13.50	(k) 1,600,000	(k) 915,000	None
North Carolina						
	Charlotte (N. C.) Rapid Transit Co.(a).....	1918	2.00	75,000	None	None
Tennessee						
	Memphis (Tenn.) St. Ry.....	1919	130.40	5,000,000	8,164,000	None
	Chattanooga (Tenn.) Ry. & Lt. Co. (m).....	1919	68.43	(k) 5,000,000	(t) 2,790,000	None
West Virginia						
	Morgantown (W. Va.) & Wheeling Trac. Co. (s).....	1916	(s) 27.00	345,000	500,000	214,000
	Grafton (W. Va.) Lt. & Power Co.....	1917	7.00	(t) 400,000	(t) 300,000	None
	West Va. Traction & Elec. Co. (Wheeling) (a).....	1919	39.00	1,869,600	4,762,000	None
	So. Morgantown (W. Va.) Trac. Co. (a).....	1919	6.00	36,000	None	None
	Summary					
	Total 1/1/20.....	14 cos.	567.48	\$25,980,600	\$40,500,004	\$270,000
	Net changes and corrections.....	1 cos.	9.44	75,000	2,790,624	420,000
	Receiverships added during 1920.....	1 cos.	21.70	1,100,000	1,789,900	25,000
	Less those sold or reorganized during 1920.....	3 s.	47.00	1,980,500	4,762,000	.....
	Net receiverships 12/31/20.....	13 cos.	532.74	25,175,000	34,737,280	715,000
West of the Mississippi River						
Arizona						
	Tucson (Ariz.) Rapid Transit Co.....	1919	4.35	500,000	114,800	None
Colorado						
	Denver (Col.) & Interurban R.R. (d).....	1918	44.43	101,500	1,079,000	None
	Colorado Springs (Col.) & Cripple Creek R.R. (d).....	1919	78.80	(k) 2,000,000	(k) 2,827,878	(k) 50,000
	Denver (Col.) Tramways.....	1920	227.45	6,156,300	19,388,025	None
Idaho						
	Caldwell (Id.) Traction Co.....	1920	11.40	250,000	None	None
Iowa						
	Des Moines (Ia.) City Ry. Co.....	1918	94.00	1,305,000	5,981,000	10,000
Kansas						
	Southwestern Interurban Ry. (Winfield).....	1919	25.00	150,000	None	None
Louisiana						
	New Orleans (La.) Ry. & Lt. Co.....	1919	222.12	(k) 30,199,050	(k) 38,481,000	(k) 750,000
Minnesota						
	St. Paul Southern Ry. Co. (Hastings) (d).....	1918	17.54	658,225	425,400	40,000
Missouri						
	Kansas City (Mo.) Outer Belt Elec. R.R. (d).....	1912	()	None	1,298,000	100,000
	Kansas City, Ozark & Southern Ry. (Ava) (d).....	1913	15.00	300,000	None	.....
	Kansas City (Mo.), Lawrence & Topeka R.R.....	1919	12.00	250,000	400,000	None
	United Railways Co. of St. Louis (Mo.).....	1919	460.90	41,296,000	52,603,000	3,177,000
	Missouri Electric R.R. (St. Louis).....	1919	19.06	1,000,000	700,000	None
	Kansas City (Mo.) Railways.....	1920	311.50	(w) 100,000	30,364,350	None
Oregon						
	Southern Oregon Traction Co. (Medford) (d).....	1918	8.19	150,000	150,000	.....
Texas						
	Corpus Christi (Tex.) Ry. & Lt. Co.....	1919	9.75	.....	(g) 1,694,507	14,539
	Greenville (Tex.) Ry. & Lt. Co. (a).....	1919	8.00	300,000	300,000	None
	Bryan (Tex.) & College Interurban Ry.....	1920	7.75	(u)	(u)	(u)
	Summary					
	Total 1/1/20.....	15 cos.	1,002.26	\$78,210,975	\$104,470,078	\$3,063,611
	Net changes and corrections.....	.....	3.78	1,000	1,484,507	1,077,928
	Receiverships added during 1920.....	4 cos.	558.10	6,506,300	49,752,375	.....
	Less those sold or reorganized during 1920.....	2 s.	84.80	2,300,000	5,177,878	50,000
	Net receiverships 12/31/20.....	17 cos.	1,480.34	82,416,275	152,579,082	4,091,539
RECAPITULATION						
	Total 1/1/20.....	84 cos.	4,791.45	\$263,852,224	\$456,097,317	\$27,686,434
	Net changes and corrections.....	2 cos.	29.11	9,591,544	1,363,117	1,197,928
	Receiverships added during 1920.....	16 cos.	692.11	25,313,655	68,800,575	59,800
	Less those sold or reorganized during 1920.....	11 c s.	274.90	6,182,400	9,175,378	53,000
	Net receiverships 12/31/20.....	91 cos.	5,330.25	280,456,935	514,080,197	28,892,162

- NOTES**
- (a) Sold at foreclosure during 1920.
 - (b) Still in receivership but leased to Newport County Electric Co. Figure given in funded debt column includes proportion of capital stock applicable to electric railway.
 - (c) Property is being dismembered and reorganized without foreclosure sale, but under receiver.
 - (d) Included in last years' report. No information available as to present status.
 - (e) Reported as sold by foreclosure during 1920, without formal receivership proceedings.
 - (f) Figures represent railway securities only. Estimated to be 67.4 per cent of total.
 - (g) Property is being dismembered and sold, but not under formal foreclosure proceedings.
 - (h) Figures include Hamburg Railway Company \$750,000 First Mortgage Bonds, due Nov. 1926 on 17.70 miles track for which separate receiver was appointed Aug. 31, 1920.
 - (i) Included in that of the Atlantic Shore Railway.
 - (j) This Company secured right of way but built no track.
 - (k) Securities include total property. Railway cannot be separated.
 - (l) Figures given are for total amount of B. R. T. securities in the hands of the public, including also those of lessor companies whose securities are guaranteed by the B.R.T.
 - (m) Receivership limited to Chattanooga Railway lines only.
 - (n) Includes certificates of indebtedness held by B.R.T.
 - (o) Figures given cover steam and electric divisions, of which 18.50 miles is electric. It is reported operation ceased May 17, 1920, and line is partly dismantled.
 - (p) Excludes track and securities of three leased and controlled companies which have been returned to their owners for independent operation; viz.: Eighth Avenue R.R., Ninth Ave. R.R., and the New York and Harlem R.R. (Fourth Avenue lines.)
 - (q) Total of securities outstanding for combined property.
 - (r) Railway securities shown, estimated at 57.2 per cent of total.
 - (s) But three miles of road is electrified, the balance being operated by steam. Figures shown are for the entire property.
 - (t) Figures given are for railway property only.
 - (u) No information available.
 - (v) Has no track built.
 - (w) Stock has no par value. Nominal value given.
 - (z) No bonds issued. Cost of construction carried by temporary note issues. \$20,000 in stock subscription rights.
 - (y) Includes notes and bank loans.

The list of entire companies abandoned and junked is about the same in number and character as last year, but the number of companies reporting partial abandon-

ments and suspensions is much greater. It is evident that there has been a determined effort to eliminate unprofitable track and service, in order to preserve investments threatened by shrinkage of net earnings.

TABLE VI—ABANDONMENTS—PARTIAL—1920

(Includes all pieces of track, sidings, yards, etc., permanently abandoned—Companies arranged alphabetically by States)

	Miles
Humboldt Transit Co. (Eureka, Cal.)	0.95
Los Angeles (Cal.) Ry.	5.40
Peninsula Ry. Co. (San Jose, Cal.), (spur track)	0.17
Point Loma Ry. (San Diego, Cal.)	1.80
Sacramento-Northern Rys., Cal. (spurs and sidings)	1.02
San Francisco-Oakland Terminal Rys. (Cal.)	0.19
San Jose (Cal.) R.R.	1.56
Denver & Intermountain R.R. (Col.)	0.08
Denver (Col.) Tramways	0.41
Connecticut Co. (New Haven, Conn.) (sidings)	0.83
Shore Line Electric R.R. (Norwich, Conn.), (between New Haven and New London)	64.66
Tampa (Fla.) Electric Co.	0.16
Georgia Ry. & Power Co. (Atlanta, Ga.)	0.17
Savannah (Ga.) Electric Co.	1.60
Alton (Ill.) Granite & St. Louis Trac. Co.	0.93
Chicago (Ill.) Railways	1.03
East St. Louis (Ill.) & Suburban Ry.	0.16
Indiana Service Corp. (Ft. Wayne)	0.17
Interurban Ry. (Des Moines, Ia.)	4.72
Arkansas Valley Interurban Ry. (Wichita, Kan.)	2.00
Manhattan City (Kan.) & Interurban Ry.	1.60
Salina (Kan.) St. Ry.	0.50
Southeastern Interurban Ry. (Winfield, Kan.)	3.00
United Railways & Electric Co. (Baltimore, Md.)	0.90
Berkshire St. Ry. (Pittsfield, Mass.)	13.00
Massachusetts Northeastern St. Ry. (Haverhill)	3.30
Medway & Dedham St. Ry. (Westwood, Mass.)	4.00
Grand Rapids (Mich.) Ry. Co.	4.13
Wisconsin Ry., Lt. & Power Co. (Winona, Minn.)	0.44
City Light & Traction Co. (Sedalia, Mo.)	8.25
Kansas City (Mo.) Railways	0.63
New York State Rys.	0.39
Ogdensburg (N. Y.) St. Ry.	0.50
Orange County Traction Co. (Newburgh, N. Y.)	0.28
Waverly (N. Y.) Sayre & Athens Trac. Co.	3.02
Reno (Nev.) Traction Co.	4.00
Toledo (O.) Rys. & Lt. Co.	0.64
Toledo, Bowling Green & Southern Trac. Co. (Findlay, O.)	3.00
Bartlesville (Okla.) Interurban Ry.	5.00
Chickasha (Okla.) St. Ry.	1.00
Guthrie (Okla.) Ry. Co.	0.50
Portland (Ore.) Railway, Light & Power Co.	1.34
Northwestern Pennsylvania Ry. (Meadville, Pa.)	1.40
Pittsburgh (Pa.) Railways	1.03
Shamokin & Mt. Carmel (Pa.) Transit Co.	0.75
El Paso (Tex.) Ry. Co.	0.15
Virginia Ry. & Power Co. (Norfolk Div.)	6.00
Seattle (Wash.) Municipal Ry.	0.29
Tacoma (Wash.) Ry. & Pwr. Co.	0.08
Monongahela Valley Trac. Co. (Fairmont, W. Va.)	0.20
Milwaukee (Wis.) Elec. Ry. & Lt. Co.	0.65
New Brunswick Power Co. (St. John, N. B.)	0.25
Grand River Ry. (Galt, Ont.)	2.00
Montreal Tramways (Que.)	0.96
Winnipeg Electric Ry. (B. C.)	1.24
British Columbia Electric Ry. Co. (Vancouver)	2.24
Total for 1920 (56 Cos.)	160.68

TABLE VII—SUSPENSIONS OF SERVICE 1920

(Includes miles of track on which companies have ceased to operate, but which have not been permanently abandoned or ripped up.)

	Miles
Douglas (Ariz.) Traction & Lt. Co.	10.00
San Diego (Cal.) Electric Ry.	4.96
Miami (Fla.) Traction Co.	5.00
Indiana Service Corp. (Ft. Wayne, Ind.)	8.64
Androscoffin & Kennebec Ry. (Lewiston, Me.)	8.00
United Railways & Electric Co. (Baltimore, Md.)	4.30
Berkshire St. Ry. (Pittsfield, Mass.)	19.53
Boston (Mass.) Elevated Ry.	8.00
Eastern Massachusetts St. Ry. System:	
Line between Wakefield & Lynn	2.32
Line between East & South Weymouth	3.49
Line between Wilson's Corner and Andover Sq.	1.39
Line between Mann's Corner and Assinippi	1.07
Line between Hyde Park and Dedham	3.15
Line between Linden and Cliftondale	1.58
Line between Saugus and Cliftondale	0.86
Gloucester Div. (all lines)	22.49
Wollaston loop (Quincy Div.)	2.27
Lincoln Ave., Haverhill	0.91
Milford (Mass.) Attleboro & Woonsocket St. Ry.	3.80
Kansas City (Mo.) Railways	2.51
Jersey Central Traction Co. (Keyport, N. J.)	2.06
Point Pleasant (N. J.) Traction Co. (Entire line)	3.72
Trenton, Lakewood (N. J.) & Seacoast R. R.	3.00
Brooklyn (N. Y.) Rapid Transit Co.	30.00
Ocean Ave. and Rogers Ave. lines from Flatbush Ave. and Rogers St. to Eastern District Ferry	
Church Ave. line from Church and Reekaway Aves. to 39th St. Ferry	
Park Avenue line from Broadway to Sands St. (entire line)	
Metropolitan Ave. line from Dry Harbor Ave. to Jamaica, also from Flushing Ave. to East River	
Wyckoff Ave. line from Myrtle Ave. to Flushing (entire line)	
Ralph Ave. Shuttle from Ralph Ave. and St. Johns Place to Church Ave.	
Westchester St. R. R. (White Plains, N. Y.)	1.12
Goldsboro (N. C.) Electric Ry. (Entire line)	5.00
Pennsylvania & Ohio Trac. Co. (Ashtabula, O.)	2.00
Springfield (O.) Terminal Ry. & Power Co. (Entire line)	28.00
Toledo (O.) Rys. & Lt. Co.	0.75
Longview (Tex.) & Junction Ry. (entire line)	1.00
Walla Walla (Wash.) Valley Ry.	3.60
Total for 1920 (22 Cos.)	194.46

The largest individual abandonment reported is that of the Shore Line Electric Railway of Connecticut, which has abandoned 64 miles of track between New Haven and New London. Eight miles of this has already been torn up. It is now reported that some efforts are being made by certain communities along these abandoned routes to arrange for restoring service.

The trustees operating the Eastern Massachusetts Street Railway, formerly the Bay State system, have continued their policy of suspension of service on lines where the traffic would not support operation at any reasonable rate of fare. The largest portion of this system which ceased operation was the entire Gloucester Division, involving 22 miles of track. In some communities in Eastern Massachusetts operation has only been continued by means of local subsidies. The trustees have also practically eliminated jitney competition by the straightforward expedient of giving the local authorities the option of properly regulating the jitneys or giving up the street car service, and in several instances have given the citizens a trial of jitney service without street cars. This single experiment has generally demonstrated without question the inability of the jitneys adequately to provide for the transportation requirements of the community.

Altogether, the financial situation of the electric railways during 1920 may be said to have been a little better than during the two years immediately preceding, but it is still far from being even moderately satisfactory, and many companies are still running so close to the danger of bankruptcy that it is a question whether they can survive the business depression which the country as a whole is now experiencing.

Securing Co-operation of Trainmen in Accident Reduction

W. R. ALBERGER, vice-president and general manager San Francisco-Oakland Terminal Railways, recently addressed a letter to the motormen and conductors on his property giving them a report of the accident situation for the first nine months of 1920 as compared with the same period of 1919. By means of tables and comments he showed that the accidents over which the motormen and conductors had control had decreased in number this year by thirty-seven, and he expressed the thanks of the management for this showing. He said that whereas in 1919 there was an accident for every 30,319 passengers, in 1920 there was one for every 31,212 passengers. For ten months, including October, 1920, \$110,039 had been expended for injuries to persons and damage to property, settlements by the claim agent or in lawsuits, as compared with \$40,942 for the preceding year. These costs were 3.5 per cent of the operating expenses in 1920 as compared with less than 1.8 per cent in 1919.

Trackless Trolley in Richmond

FURTHER details are available in regard to the proposed trackless trolley system in Richmond, Va., mentioned on page 1167 of the issue of this paper for Dec. 4. A trial bus, seating thirty persons, will be tested out by the Virginia Railway & Power Company on Floyd Avenue. If successful other lines will be built.

Electric Railway Statistics

Figures Are Given by States and Districts of the Number of Electric Railway Companies Operating, with the Miles of Single Track and the Amount and the Type of All the Rolling Stock Owned by Them

STATISTICS of the miles of track and types of rolling stock of the electric railway companies in the United States have been compiled from the August, 1920, "Electric Railway Directory" of the McGraw-Hill Company and are given in the accompanying table. This information was gathered for the directory in June and July of this year and may be said to represent the statistics of the electric railways about July 1, 1920. This date corresponds to that of a similar table for last year, published on page 56 of this paper for Jan. 3, 1920.

In the compiling of this table every effort has been made to prevent duplication. This was difficult in some cases, where both the holding and operating company had submitted figures covering the same mileage and equipment. The mileage is single track equivalent for all the city and interurban companies, but for the electrified steam railroads their route mileage (aggregating 1,734 miles) was taken. The difference here represents a difference in practice in reporting mileage followed by the steam and electric railways. With the rolling stock, the passenger and freight cars are subdivided into motor and trailer. Service cars are non-revenue cars, such as work cars, snow plows, etc. "Other cars" consist of funeral, sleeping, dining and other miscellaneous cars which cannot be accurately classified.

If the totals of 1920 are compared with those of 1919 a decrease of ten in the total number of companies will be noticed. This decrease represents the companies which have ceased operation. The miles of track show a decrease of 236 from 47,941 miles in 1919 to 47,705 miles in 1920, while the total rolling stock shows an increase of 643 cars from 104,945 in 1919 to 105,588 cars in 1920. The differences in the reports of individual companies to account for these changes can be traced, but owing to probable variations in the methods followed by the companies in reporting, the numerical differences mentioned above are not very significant. Many companies use the terms "express cars," "freight cars" and "service cars" as interchangeable terms.

A short explanation should be made as to the inclusion and exclusion from the table of the freight cars of certain roads. As the primary purpose of the table as regards cars is to give the number in regular electric passenger and freight service, in cases where a company engaged extensively in interchange and had a large number of freight cars in comparison to its passenger cars, the freight cars have, as a rule, been omitted. This step was taken in the case of 1,422 trailer freight cars of the Northwestern Pacific Railroad Company, 2,405 trailer freight cars of the Fort Dodge, Des Moines & Southern Railroad, and 2,809 trailer freight cars of the Long Island Railroad. The 3,000 "other" cars reported by the Chicago Tunnel Company were also omitted. The table includes the 1,171 freight trailers of the Pacific Electric Railway, 510 coal cars of the St. Louis & Bellevue Electric Railway for transporting coal over a line about 17.63 miles long, and 910 freight cars of the Illinois Traction Company.

This year, as will be noticed, an attempt has been made to separate the "other cars" into the subdivisions

STATISTICS OF ELECTRIC RAILWAY COMPANIES IN THE UNITED STATES

State	No. of Companies Operating	Miles of Single Track	Passenger Cars		Electric Locomotives	Freight and Express Cars			Other Cars	
			Motor	Trailer		Motor	Trailer	Service Cars		
New England States										
Connecticut....	8	1,425.83	1,869	98	108	95	22	24	258	
Maine.....	13	519.71	538	10	5	29	80	99	95	
Massachusetts....	34	2,887.28	6,411	271	14	216	11	911	125	
New Hampshire....	11	250.95	290	..	1	1	1	20	14	
Rhode Island....	4	422.97	1,082	59	4	34	69	174	5	
Vermont.....	8	103.13	127	..	4	10	9	11	3	
Total.....	78	5,609.87	9,317	438	136	385	192	1,239	500	
Eastern States:										
Delaware.....	2	158.80	225	98	..	4	1	28	4	
D. of Columbia....	8	413.30	1,124	263	7	22	41	57	38	
Maryland.....	12	707.70	2,050	59	14	3	48	24	89	
New Jersey.....	23	1,591.78	3,171	2	2	20	5	318	46	
New York.....	84	5,772.34	17,762	1,893	158	160	43	1,083	1,176	
Pennsylvania....	101	4,306.69	7,419	129	4	109	115	619	1,575	
Virginia.....	12	440.43	775	60	3	16	29	59	6	
W. Virginia.....	18	670.76	632	23	13	29	4	41	59	
Total.....	260	14,061.80	33,158	2,527	201	363	286	2,230	2,993	
Central States:										
Illinois.....	55	3,737.83	5,815	740	53	15	1,967	138	316	
Indiana.....	30	2,420.03	1,867	64	9	61	439	100	336	
Iowa.....	23	946.49	941	60	36	18	400	53	182	
Kentucky.....	7	455.60	1,013	22	..	12	27	43	21	
Michigan.....	24	1,787.00	2,792	70	20	47	332	119	321	
Minnesota.....	12	735.33	1,377	14	1	2	15	16	105	
Missouri.....	22	1,166.80	2,667	174	3	12	115	110	69	
Ohio.....	59	4,190.82	5,165	542	28	132	332	520	458	
Wisconsin.....	16	767.98	902	112	2	..	..	21	407
Total.....	248	16,207.88	22,539	1,798	152	299	3,512	1,120	2,215	
Southern States:										
Alabama.....	12	361.98	427	89	1	5	2	27	141	
Arkansas.....	10	128.80	240	10	..	4	..	2	26	
Florida.....	10	218.75	305	11	..	7	21	14	11	
Georgia.....	12	487.71	677	43	1	3	22	47	29	
Louisiana.....	9	322.66	654	51	..	8	1	106	9	
Mississippi.....	7	97.87	116	2	2	..	..	..	23
North Carolina....	11	302.62	323	13	18	6	177	11	11	
South Carolina....	4	147.27	187	27	..	..	..	5	18
Tennessee.....	11	453.99	741	100	1	1	2	46	41	
Total.....	86	2,521.65	3,670	346	23	34	225	258	309	
Western States:										
Arizona.....	4	54.20	52	1	..	..	..	2	..
California.....	35	3,322.03	3,661	317	68	33	1,648	502	146	
Colorado.....	14	483.94	444	145	8	6	171	43	40	
Idaho.....	3	102.20	37	..	..	..	26	..	2
Kansas.....	14	515.05	369	45	2	17	88	26	27	
Montana.....	7	856.56	119	26	89	..	5	15	..	
Nebraska.....	4	301.96	583	20	1	..	..	6	50
Nevada.....	2	10.80	9	..	..	..	..	..	..
New Mexico.....	2	10.95	16	..	..	..	..	..	..
North Dakota....	4	27.08	37	24	..	2	..	5	..	
Oklahoma.....	16	331.32	292	11	3	2	42	19	64	
Oregon.....	8	696.18	731	93	24	8	477	129	35	
South Dakota....	3	25.85	33	4	..	..	..	1	3
Texas.....	22	1,021.62	1,297	136	1	19	9	79	62	
Utah.....	5	448.12	214	40	17	2	73	3	219	
Washington.....	14	1,073.86	1,129	51	26	39	687	46	146	
Wyoming.....	2	22.00	15	5	..	..	..	..	4
Total.....	159	9,303.72	9,038	918	239	134	3,226	876	792	
Total U. S. 1920	831	47,704.92	77,722	6,027	751	1,215	7,441	5,723	6,809	
Total U. S. 1919	841	47,941.45	79,355	4,447	869	866	5,622	3,672	10,114	
Total rolling stock, 1920.....			105,588	Total rolling stock, 1919.....			104,945			

mentioned above. Therefore, while the "other" cars have decreased by 3,305 cars, the service, freight and express cars have increased.

In the compilation of this year's table and its comparison with that of last year a few errors, slight in magnitude, were found in the 1919 table. In the comparative figures for the two years given above these errors have been corrected in the 1919 statistics.

Letters to the Editors

Budget Plan in Cincinnati

OFFICE OF DIRECTOR OF STREET RAILROADS

CINCINNATI, OHIO, Dec. 28, 1920.

To the Editors:

The article by Mr. Flint in the current issue of the *ELECTRIC RAILWAY JOURNAL* is timely. The budget plan of control under the Cincinnati franchise has had two years of trial under the most severe test that could be experienced. Up to the time of its inauguration the Cincinnati Traction Company had not adopted the Interstate Commerce Commission's system of accounting and it was installed simultaneously with the budget.

This of course involved great difficulty in obtaining data from past experience upon which to forecast the probable requirement for the next year. In addition there were sharp fluctuations in the prices of labor and materials and a change in the public works program of the city necessitated track construction on a number of streets not under consideration at the time of the preparation of the budget.

The company opposed the plan in the preparation of the ordinance and at no time had much sympathy with it. I think, however, the officers tried to gather the information as efficiently as possible considering the fact that the experience was new. In spite of these difficulties, I am confident that the results fully warrant the conclusion that the method is not only feasible but far more satisfactory and more easily understood by the public than that of the "car-mile allowance" plan.

The Cincinnati plan provides that forty-five days before the end of the year the company shall submit to the Director of Street Railroads "an estimate of gross receipts and budget of operating expenses for the ensuing calendar year, including the expenses of performing its corporate obligations and maintaining its corporate organization, setting forth an estimate of the total to be expended in the ensuing year under each of the general accounts as provided by the uniform system of accounts for electric railways prescribed by the Interstate Commerce Commission, provided, however, that during the year additional expenditures for such operating expenses may be made upon the approval of the Director of Street Railroads of supplementary estimate or estimates."

It will be seen that the budget applies to operating expenses only, since the other deductions are either specifically set forth in the ordinance or are passed upon separately by the Director of Street Railroads, to whom must be submitted the question of all issues of new securities and authority for capital expenditures.

To meet unforeseen contingencies, the supplementary allowance is provided, and in addition the Director of Street Railroads may authorize transfers from one account to the other. This gives the budget the necessary flexibility provided by monthly budgets.

The Director of Street Railroads must approve or disapprove the budget in ten days. This period is entirely too short, but provision is regarded as directory and not mandatory. Should he disapprove and the

company fail to agree the matter may be determined by arbitration.

Although the sums fixed in the budget are by general accounts only, the full detail of the primary accounts is furnished and, under the ordinance, the Director of Street Railroads maintains a continuous audit and has the right to object to the purpose of any voucher. The authority, however, is far from being so complete as that of the Boston trustees. The city has no control over the personnel of the officials of the company. Some details of the actual experiences under the budget plan will point out the factor affecting it and the actual results.

In the year 1919 the actual expenses for way and structures were \$111,861.10, or 24.13 per cent, more than the original budget, which was due to street improvements requiring reconstruction of tracks, not contemplated at the time the original budget was fixed. In April, 1919, a supplementary amount of \$80,812, or 17.43 per cent, was authorized, and during the latter part of the year an amount of \$73,000, or 15.75 per cent, was transferred to way and structures from the accounts "conducting transportation" and "traffic." The city's street improvement program was not completed. This left a balance of \$41,950.90 unexpended for way and structures, which was 9.05 per cent of the original budget and 6.79 per cent of the revised estimate.

Equipment expenses increased \$29,140.82, or 5.89 per cent, over the budget, principally due to increases in wages of shop employees during the year.

Power expenses were \$52,663.29, or 6.19 per cent, more than the budget, attributable to increased cost of fuel and the use of an inferior quality, this situation growing out of the coal miners' strike.

The expenses under "conducting transportation" were \$53,513.02, or 1.91 per cent, less than the budget, due in part to the introduction of large cars in place of small ones. During the latter part of the year an amount of \$6,600, or 2.37 per cent, was transferred to way and structures, so that the account "conducting transportation" showed a net increase of \$12,486, or 0.46 per cent over the original budget.

Traffic expenses were \$8,570.75, or 69.68 per cent, less than the budget, of which \$7,000, or 56.91 per cent, was transferred to way and structures.

General and miscellaneous expenses increased 5.89 per cent over the original budget, owing to increases in salaries of office employees, cost of printing tickets and injuries and damages.

The total operating expenses for the year were \$158,582.73, or 3.12 per cent, more than the budget. Deducting the additional amount of \$80,812, authorized in the early part of the year for track construction, leaves \$77,770.73, or 1.53 per cent, over the original budget and 1.51 per cent over the revised estimate.

For the first nine months of 1920 way and structures expenses were \$38,197.69, or 9.44 per cent, less than the budget. This amount will probably be reduced during the remaining months of the year, as there are several large pieces of track under reconstruction.

Equipment expenses increased \$90,805.83, or 20.70 per cent, of which \$67,642.35, or 15.42 per cent, is for depreciation of new cars and \$7,500, or 1.71 per cent, for increases in wages of shop employees, which were not taken into consideration when the original budget was fixed. This leaves an increase of \$15,663.48, or 3.57 per cent.

Power expenses were \$162,041.89, or 22.38 per cent high, principally due to the increased cost of coal and increased consumption owing to the receipt of inferior quality purchased from companies other than those delivering coal under contract.

Conducting transportation increased \$208,856.71, or 9.96 per cent, of which \$135,000, or 6.44 per cent, is attributable to the increase in wages granted employees, effective July 1, 1920, which could not be foreseen in 1919. This leaves an increase of \$73,856.71, or 3.52 per cent.

Traffic expenses decreased \$1,706.82, or 22.99 per cent, principally due to a decrease in advertising.

General expenses were \$1,298.70, or 0.33 per cent, more than the budget, the excess consisting of various small amounts.

The total operating expenses for the nine months of 1920 increased \$427,598.62, or 10.60 per cent, over the original budget. Taking into consideration the items enumerated above reduces this amount to \$97,317.68, or 2.39 per cent.

It is therefore evident that under normal economic conditions an annual forecast within 3 per cent of the actual could be attained even in the absence of very complete data as to past performances. With the experience that each succeeding budget will afford this variation should be materially improved.

W. C. CULKINS, Director.

Railway President Favors Budget System

THE UNITED RAILWAYS & ELECTRIC COMPANY
OF BALTIMORE

BALTIMORE, MD., Dec. 29, 1920.

To the Editors:

I have read with much interest the article by Mr. Flint appearing in the Dec. 25 issue of the *ELECTRIC RAILWAY JOURNAL* on the budget system. This article interests me particularly because I established this system on the Boston Elevated when general manager of that property. The system was originally used by the writer when general manager of the Chicago, South Bend & Northern Indiana Railway and later on the Boston & Worcester Street Railway. It is now in use by the United Railways & Electric Company of Baltimore.

Our procedure is as follows: On or before the twentieth of a given month the actual figures for the succeeding month of the preceding year are given to the heads of departments. On or before the twenty-fifth of the month the department heads submit to the auditor their estimated requirements for the coming month. The auditor, in consultation with the president, works up the controlling sheet, estimating as nearly as possible the revenue expected to be obtained. They then estimate such expenditures as they feel can be allowed, meeting, if possible, the estimates of the department heads, but requiring that these estimates be cut if necessary to meet the income.

At an officers' meeting held prior to the first of the month, the estimates and allowances are distributed to the several heads of departments, and the question of the allowances is discussed. About the fifteenth of the month department heads are expected to check up their expenditures to determine whether the allowances are being conformed to. At the same time the receipts are checked up, and if it is found that these are not likely to reach the original estimates a further cut in

the budget allowances is made and department heads are expected to meet this during the balance of the month.

After working under this system for the past ten years we feel that it is a great help in working out the financial problems of a company.

C. D. EMMONS, President.

Association News

Committee of 100 Members Appointed

GENERAL GUY E. TRIPP, chairman of the Committee of One Hundred, has announced the personnel of the executive committee of the Committee of One Hundred, as follows:

H. L. Stuart, Halsey Stuart & Company, Chicago, Ill.
Randal Morgan, vice-president United Gas Improvement Company, Philadelphia, Pa.
Arthur W. Brady, president Union Traction Company of Indiana, Anderson, Ind.
Thomas N. McCarter, president Public Service Railway Company, Newark, N. J.
Colonel Philip J. Kealy, president Kansas City Railways Company, Kansas City, Mo.
S. M. Curwen, president J. G. Brill Company, Philadelphia, Pa.
P. H. Gadsden, vice-president United Gas Improvement Company, Philadelphia, Pa.
O. B. Willcox, vice-president Bonbright & Company, New York, N. Y.
Barron Collier, president Barron G. Collier, Inc., New York, N. Y.
Lucius S. Storrs, president The Connecticut Company, New Haven, Conn.
Francis H. Sisson, vice-president Guaranty Trust Company, New York, N. Y.
O. D. Young, vice-president General Electric Company, New York, N. Y.
J. K. Choate, vice-president the J. G. White Management Corporation, New York, N. Y.
J. H. Pardee, president the J. G. White Management Corporation, New York, N. Y.
James D. Mortimer, North American Company, New York, N. Y.
Britton I. Budd, president Metropolitan West Side Elevated Railway, Chicago, Ill.
James H. McGraw, president the McGraw-Hill Company, Inc., New York, N. Y.
Guy E. Tripp, chairman board of directors Westinghouse Electric & Manufacturing Company, New York, N. Y., chairman.

Section in Virginia Reorganized

AT A MEETING held on Dec. 17 the employees of the Newport News & Hampton Railway, Gas & Electric Company reorganized their company section, and judging from the large and enthusiastic turnout they intend to make it a big thing on the Peninsula. J. N. Shannahan, president of the company, explained the purposes of the organization, and H. W. Cox, secretary of the Industrial Y. M. C. A., spoke on welfare work.

E. M. Braxton, attorney for the company, also addressed the section, treating of the employee as the point of contact with the public and the results accruing from the impressions made at this point.

The following officers were then elected: President, E. C. Kelly; vice-president, H. C. McAllister; secretary, J. W. Howard; and treasurer, H. W. Daughtry.

Recent Happenings in Great Britain

Tramway Situation Critical, with Men Demanding Wage Advances and Limit About Reached in Fare Increases

From Our Regular Correspondent

The details given in a report to the British Joint Industrial Council for the Tramway Industry, an abstract of which is included in this letter, show that the industry is in quite as perilous a condition as was the American electric railway industry not long ago. In the face of the new demand for higher wages, the ominous thing is that in many cases it is believed the critical point has been reached, in that further increases of fares will not produce increased revenue. It is not surprising that the tramway companies withdrew from all further negotiations, and that the municipalities refused arbitration. They simply say that they can not pay more. The tramway-operating municipalities have the rates (local taxes) to fall back upon as a last resort, but the companies have no such resource. They are also in many cases suffering from Government delay in granting them authority to increase their statutory maximum fares. Such increase, as indicated above, is often only a forlorn hope.

NO settlement has been reached in regard to the demand from the tramway workers of Great Britain for a further increase of wages of 12s. a week. A month ago I mentioned that when the claim originally came before the National Joint Industrial Council for the Tramway Industry the representatives of the tramway companies withdrew from the Council on the ground that they were unable to pay any further increase. The representatives of the municipal tramway undertakings and of the employees decided to continue negotiations and that their secretaries should carry out an investigation regarding wages, the cost of living, and the financial position of the undertakings. The report by the secretaries was issued on Nov. 13. It revealed a serious state of affairs. To a questionnaire sent out, eight-one municipal tramway authorities employing 47,273 men replied. On Oct. 1, when the cost of living had risen 164 per cent above the pre-war scale, the increases of wages which had been granted amounted to: Drivers, 132 per cent; conductors, 147 per cent; car repairers, 140 per cent; car cleaners, 163 per cent. The working week had been reduced from sixty hours to forty-eight hours.

EARNINGS PER CAR MILE INCREASE

As to receipts per car mile, in 1913-14, forty-seven undertakings earned not more than 11d. per mile run. In 1919-20 there were sixty-one undertakings which earned not less than 18d. per car mile. In September and October, 1920, no undertaking earned less than 15½d. per car mile and only seventeen earned less than 20d. per car mile. Notwithstanding the increase in receipts, the expenses had gone up so much that the tramway industry of the whole country was being carried on at least at loss of at least £1,556,000 during the last financial year.

The application now made for increased wages would involve a further wages charge of about £1,481,000, equal to 1.59d. per car mile. Taking the current financial year, the estimated loss

on working was £3,310,000, and with the additional charge now demanded the loss would be £4,793,000. The actual revenue at present was 3.55d. per car mile less than the expenditure, and with the new demand it would be 5.14d. This was a condition of affairs under which no industry could survive. Out of ninety-eight local authorities working tramways, down to Oct. 26 twenty-five had applied to the Ministry of Transport for orders to increase their statutory maximum charges.

This report came before the Joint Council on Nov. 17. The employers' representatives were of the opinion that whatever increased fares might be charged no increased revenue would result as the economic limit had been reached. They therefore declared that they were unable to accede to the wage application or any part of it. The trade union representatives then proposed arbitration and the meeting was adjourned to allow the opinion of all municipal tramway authorities to be taken on the proposal.

The Joint Council met again on Dec. 7, when all negotiation broke down. It was reported, as the result of the referendum, that the majority of the municipal tramway authorities in the country would not consent to submit the wage claim to arbitration because if an arbitrator they could not afford to pay it. No local authority was in favor of the advance, though a minority of them would have agreed to arbitration. As soon as this result was announced, the meeting of the Council broke up.

At the time of writing the prospect is that there will be no general tramway strike, as it has been made abundantly clear that strike or no strike the concession cannot be granted, for the money for the purpose does not exist. The municipal undertakings do not intend to give advances which would have to be charged on the rates (local taxes), and the companies have no funds for the purpose. It is something gained that a dead-end has at last been reached, and if the employers now stand firm in

their present position there will be no further increases of wages.

An impudent attempt by Edinburgh tramway employees to dictate to the management has failed. The men put an embargo on passengers standing in the cars, basing their action on an old regulation of the horse-car days. Their object evidently was to require the use of more cars and more men. The Town Council, which owns and works the tramways, stood firm and threatened the men with dismissal. The public were put to great inconvenience during the rush hours. As the men had not submitted any grievance for consideration by the Joint Industrial Council for the industry, the Town Council resigned from that organization.

MEN TAKE ARBITRARY STAND

On Nov. 15, following the dismissal of several men who persisted in refusing to allow passengers to stand, the employees went out on strike. On the following day the manager was able to run a limited service, and on Nov. 17 the strikers returned to work. In doing so they acted on the advice of the local trades council. In this they showed wisdom, as the Town Council and the management were absolutely firm and were prepared to engage as many new men as necessary. Applicants for the jobs were plentiful.

Mr. Pick and Mr. Shave, of the London General Omnibus Company, in their paper on motor omnibus working and possibilities, presented at the recent congress of the American Electric Railway Association, referred to the fact that a new and enlarged type of omnibus was about to be tried in London. The first of these vehicles was put on the streets during November for trial and demonstration trips. This "S type" bus is 24 ft. 7 in. long, 12 ft. 3 in. high, 7 ft. 1 in. wide, and has a wheel base of 14 ft. 11 in. The engine is similar to that used on existing omnibuses. It develops 34 hp. when running at 1,000 r.p.m. The important point is that the body has been designed to seat fifty-seven passengers—twenty-nine inside and twenty-eight on the roof—thus rivalling a tramcar in capacity. The previous type seated forty-six, and the one before that thirty-four. The weight unloaded is slightly increased, but the body is only 2 ft. 2 in. longer than that of the forty-six-seater.

OMNIBUS BILL LOST

Disaster has once more overtaken the efforts of the London County Council to get Parliamentary powers to run omnibuses. The bill for this purpose was passed by the House of Commons, but when the bill came before a committee of the House of Lords in the latter part of November the London General Omnibus Company renewed its determined opposition to the matter and contended that if there was any need for the proposed omnibus services they would supply it. The Lords' committee declined to sanction the proposal in the bill.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Reply on Lease First

Detroit United Railway Indicates City Must Answer that Proposal Before Sale Is Discussed

In reply to the communication from the officials of the city of Detroit, Mich., asking the Detroit United Railway to name a price at which it would sell certain of its lines to the city, Elliott G. Stevenson, attorney for the company, replied that until the city officials deal with the proposition which the company has already submitted, namely, that of leasing the entire system, the company did not care to enter into any further negotiations.

SERVICE-AT-COST PLAN VOTE

The statement is repeated that the company will not enter into any agreement that would either directly or remotely recognize the claimed right of the city to proceed to acquire a municipal railway system under the proceedings culminating in the election of April 5. The company could not be so inconsistent as to enter into negotiations to sell the city part of the lines while challenging the validity of the proceedings and the right of the city to proceed to acquire a municipal system.

It is the purpose of the company to submit to the electors of the city at the approaching April election an initiated ordinance providing for a so-called service-at-cost operation of the street railway system under municipal supervision and regulation along the lines of the ordinance submitted according to the requirements of the City Charter, nearly a year ago to the Corporation Counsel for approval as to form.

The railway, Mr. Stevenson states, is most anxious to reach a solution of the difficulties that prevent the public having adequate transportation, but it has exhausted everything that could be thought of with a view to bringing about that result.

COMPANY OPERATING AT LOSS

If the lease proposal is rejected there remains nothing for the company to do but to submit an ordinance to the people for ratification that will finally settle the question and insure the people the kind of service they need and are entitled to.

Mr. Stevenson states that inasmuch as the commission has had auditors in its office for more than six months with the company's consent checking receipts and expenditures on account of operation, etc., the commission has probably been advised as to the fact that the operations of the company's

city system are being conducted at a loss. This situation influences the company to say that no proposition will be taken up other than the one submitted at the present time. If that is not accepted, the company will, it is stated, be compelled to take the other step indicated, and in the meantime ask the Court to fix in the pending proceedings before Judge Jayne an increased rate of fare—probably 6 cents with 1 cent for a transfer—to enable the company to operate without loss. Existing conditions impel the company to have the negotiations that are now pending brought to an early conclusion.

In reply the Street Railway Commission has repeated the request that the Detroit United Railway put a price on the lines which the city would take over. The company maintains that no dif-

ferent answer can be given to this request than was given at first.

Following the refusal of the company to set a price at which it would sell these lines, and the letter to the Street Railway Commission saying that the company was losing money, a letter was sent to the heads of the unions announcing the company's intentions to reduce wages of the platform men, effective on Jan. 1.

As was indicated in the *ELECTRIC RAILWAY JOURNAL* for Dec. 25, this proposal was rejected at a business meeting of the membership of the three locals and copy of the resolution adopted was placed in the hands of E. J. Burdick, assistant general manager for the Detroit United Railway, by Carey Furgeson, business agent for Local 26.

New Orleans Strives for Permanent Settlement

**Eight-Cent Fare Will Be Effective Until Next April—
Announcement of Policy Expected Jan. 15**

Opponents of the increased fare in New Orleans, La., are busily engaged in an effort to have the ordinance granting the increase repealed and the old rate of fare re-established. The attacks on the measure are annoying, but they have little prospect of success. The ordinance as adopted by the Commission Council authorized the company to increase fares from 6 cents to 8 cents. It will not expire until April 22, 1921. At that time the fare will automatically go back to the old rate of 6 cents, and the workmen's wages back to the old scale.

THIS ordinance was adopted by the Commission Council in lieu of the cost-plus plan recommended by the Special Masters, in order to enable the company to meet the demands of the striking employees and to provide funds needed by the company to meet increase in operating expenses caused by higher taxes and advances in the cost of fuel.

The Council approved the increase for a period of six months, during which time it was recommended that the receiver of the company would formulate some plan of action for his future guidance.

One movement to repeal the measure has just received a solar plexus blow. This was a suit brought in the Civil District Court by certain taxpayers of the city to enjoin the Commission Council from authorizing collection of the 8-cent fare. An injunction had been issued by Judge Foster, of the Federal Court, to prevent any interference with the receiver in the 8-cent fare. Counsel for the taxpayers maintained that the action was not against the receiver but against the Commission Council, which was, he alleged, without authority to grant the increase, as the franchises of the several companies embraced in the

New Orleans Railway & Light Company specifically fixed the rate of fare at 5 cents.

Judge Fred D. King, of the Civil District Court, in refusing to interfere with the order of Federal Judge Foster declared that the comity existing between the State Court and the Federal Court required him to respect the injunction issued by Judge Foster preventing interference with the collection of an 8-cent fare. In deciding the case, Judge King declared the essential grounds for the nullity of the 8-cent fare ordinance were decided adversely to the taxpayers by the State Supreme Court in a similar suit brought by Black and others against the railways when the fare was increased from 5 cent to 6 cents. In this case, Judge King said, the higher court held that the taxpayers, not having been parties to the contract between the city and the railways, had no legal interest in the matter and, as taxpayers, had no right to interfere or bring the suit.

Counsel for the taxpayers declared, after the decision, that he would make application for a re-hearing and if this were refused, an appeal would be taken to the State Supreme Court.

Another movement looking to the

repeal of the ordinance was by referendum. This campaign was very energetically pursued by a number of influential gentlemen, taxpayers of this city, one of whom was formerly president pro tem of the Senate. The law under which they sought to repeal the ordinance required the sworn affidavits for repeal of 30 per cent of the registered voters of the city. Under the present registration this practically amounted to an election almost, as they will be required to get the petitions of at least 25,000 voters.

They have obtained, so far, by the hardest kind of work and a most strenuous campaign, only 20,000 petitions, so that they still lack 5,000 votes of the goal.

The Commissioner of Public Utilities of the newly elected Council declares that he is studying the situation with the view of settling the railway matter, but is not yet ready to express his views. The Association of Commerce has also taken the matter up and is about to adopt general rates to guide it in its deliberations and to map out a plan of procedure.

The New Orleans *Times-Picayune*, in a long editorial, urges the new city administration to get to work quickly on some plan that will solve the railway matter. It maintains the time for action is short and that it is distinctly to the interest of New Orleans to see that the following ends are obtained:

1. The railway in the hands of a management possessed of the public's confidence.
2. The public paying a fare which it is convinced is no more than the costs of wise operation and sound capital make necessary.
3. The corporation earning a legitimate return upon a capitalization which the community knows is likewise legitimate.
4. The employees content with their work and wage and assured of permanent positions.

It is said the receiver is working diligently with the operating management of the company toward the desired end but that no announcement of policy will be made before Jan. 15. The complaint is made that the 8-cent fare which was expected to yield \$1,500,000 annually will not show a greater revenue than \$1,300,000. The loss of revenue from short hauls has exceeded expectations.

Reorganization of International Association

The International Street & Interurban Railway Association, with headquarters at Brussels, has just issued a circular explaining that certain objections had been raised to the proposed reorganization of the association. The reorganization proposed was to dissolve the association and then immediately reorganize it with a membership confined to countries which participated on the allied side or were neutral during the recent war.

The objections which were raised to this plan were that such a procedure would be illegal under the Belgian law unless a referendum was taken of all of the former members of the association. To this point the officers of the association reply that a general statute

authorizing such action is now under consideration in the Belgian parliament and the proposed action will be taken after the passage of this act.

Although the association has lost many members, particularly in Russia, its membership now numbers 250. The association had hoped to hold a meeting in Brussels this year, but the plan had to be abandoned because of the difficulties of traveling for those residing at a distance from Belgium.

Toledo Candidates Narrowed

Only Three Names Remain in the Race for Railway Commissionership—
Railway Man Considered

The board of sinking fund commissioners of the city of Toledo, Ohio, is considering at present several names as possible appointees to the board of directors of the new Community Traction Company, one of the members of which is to be selected by that body to represent the city.

Under the provision of the service-at-cost ordinance for retiring bonds of the company common stock is issued to the city as each unit of bonds is retired. As it acquires common stock ownership of the railway the city will be represented on the board of directors. The membership of the board is five at present. Four of these members will be company representatives.

COMMISSIONER'S SALARY PROBABLY
\$10,000

It is thought the sinking fund commissioners will name one of their own number or a member of the board of control. At the meeting on Dec. 28 the board decided to ask Mayor Cornell Schreiber for a legal opinion on the duties and qualifications of the man to be appointed.

The sinking fund commissioners are Edward Kirschner, vice-president of the Ohio Savings Bank & Trust Company; Rollin H. Scribner, manager of the investment department of Secor, Bell & Beckwith; W. Lockwood Lamb, cashier of the National Bank of Commerce; and Johnston Thurstin, attorney.

Mr. Thurstin was a member of a street railway commission which at one time drafted a community ownership solution for the settlement of the traction problem.

At a meeting of the street railway board of control last Monday it was decided that a practical street railway man would probably be the choice of the board for transportation commissioner. It was also decided that his salary would probably be \$10,000 a year. The selection has narrowed down to about three of the dozen or more applicants. The appointment will probably be announced about the middle of January, members of the board declared.

It is thought now that the legal work of separating the railway property of the Toledo Railways & Light Company, from all of the company's many other interests will be completed so that the transfer to the new system of operation may be made about Feb. 1.

Wage Conference Planned

Full and Frank Discussion of Reduction of Trainmen's Pay Planned at Detroit

A communication sent to the officials of the Detroit (Mich.) United Railway after W. D. Mahon, international president of the amalgamated, had conferred with executives of the union on the proposed reduction of approximately 20 per cent in the wages of the platform men, signified that the men were willing to meet the company officials to discuss the subject. Their refusal to accept the lowered scale of pay was repeated.

MEN QUESTION REDUCTION IN COSTS

In the letter in answer to the Detroit United Railway's request that the men meet the company to discuss the wage question further, it was stated that members of the union were fully informed as to the facts when they voted against accepting the proposed cut in wages. The comments of E. J. Burdick, assistant general manager of the railway, relative to living costs and street railway men's wages during the war period are questioned by the men.

The company maintains it is unfair that car riders while submitting themselves to cuts in wages and working hours should be asked to pay an increase in the rate of fare in order that the motormen and conductors alone should be gainers. Moreover, the company has been quite seriously affected by the changed economic conditions.

Exception is taken to the company's statement that prices of food stuff, clothing, shoes and household furnishings have fallen to such an extent that present necessities can be met with a decreased wage scale. The men claim that the present scale is required as a minimum.

The company states that salaries of the executive officers have been voluntarily reduced, effective the first of the new year. At a meeting of the heads of the departments it was decided that salaries and wages all along the line are to be decreased. The public has been informed of the steps being taken to reduce the wage scale of conductors and motormen throughout the system to a level more in harmony with not only the decrease in living cost but comparative with the wage scales being adopted in other fields of labor.

AMICABLE ARRANGEMENT EXPECTED

The company expresses the hope that the employees will, after thoughtful deliberation, realize that it is only proper that they, too, cheerfully accept a reduction in the wage scale because such reduction is inevitable under existing conditions.

Willingness to meet and discuss any subject that is of interest to the men and the company is expressed by the men. It was repeated that they were ready for a full and frank discussion of the matter.

Removal of New Jersey Commissioners Sustained

Ousting of the Board of Public Utility Commissioners by Governor Edwards of New Jersey for "misconduct and neglect of duty" was upheld on Dec. 27 by the Supreme Court in an opinion handed down at Trenton. The decision overruled a demurrer filed by the board. It upholds the constitutionality of the section of the public utilities law giving the Governor power to remove from office upon charges and holds that in conducting the proceedings provided by law the Governor is not bound to observe any particular form so long as the proceedings are substantially in compliance with the statute.

The practical effect of the decision, unless reversed on appeal, is to remove from office President John W. Slocum, Andrew Gaul, George F. Wright and Harry L. Knight, who have continued to exercise the functions of public utility commissioners notwithstanding their removal from office by the Governor, whose appointment of new commissioners has not been acted upon by the Senate.

Immediately upon receiving word from Trenton that the Supreme Court had upheld the Governor Josiah Stryker, of Lindabury, Depue & Faulks, who represented the utilities commissioners in the ouster proceedings, stated that an appeal would be taken to the Court of Errors and Appeals.

The nominees of the Governor for the new board are: James A. Hamill, of Jersey City; Treadwell Cleveland, of Newark; former State Senator James A. C. Johnson, of Englewood; State Highway Commissioner Walter F. Whittemore, of Newton, and Arthur A. Quinn, of Perth Amboy, president of the State Federation of Labor.

Permanent Reconstruction Urged

In a letter to the City Council, D. W. Henderson, superintendent of the Seattle (Wash.) Municipal Railway, makes an urgent plea for the permanent reconstruction of the paving on First Avenue and First Avenue South and the rebuilding of the railway tracks at an estimated cost of \$350,000. Mr. Henderson declared that operation of the municipal lines over the street between Pine Street and Atlantic Street was virtually impossible, owing to the destructive effect of the bad tracks on the rolling stock.

Mr. Henderson advised that temporary repairs to improve the tracks would cost \$21,225, if made now, and would have to be done over again in two or three years, unless the entire street was repaved and new tracks laid. It was pointed out that the cost of repairs and financial loss to rolling stock due to breaking of truck frames on sagging rail joints, and injury to the whole cars from the constant jarring was excessive. Mr. Henderson's letter was referred to the streets and sewers and utilities committees.

News Notes

Miami a Prospective Buyer.—The Miami (Fla.) Traction Company is preparing to sell all its railway equipment to the city. The company has not operated its lines since Oct. 19, when a fire occurred which destroyed the carhouse and all the cars. The company operates 5 miles of single track. It has a capital stock of \$250,000.

Gretna-Algiers Men Return to Work.—The platform men of the South New Orleans Light & Traction Company, New Orleans, La., who struck recently for a wage increase voluntarily returned to work on Dec. 24 at the old wage scale of \$96 a month. A new agreement was entered into between the men and the representatives of the union whereby the old pay scale will obtain until Dec. 24, 1922, unless in the meantime the Jefferson officials authorize the railway to increase its fare. In that event the wage demands of the men will be adjusted. The company's petition for an advance in fares was rejected recently by the police jury of Jefferson Parish.

Charges Quashed.—Charges pending against Julius Caesar Jackson, Edgar C. Kerwin and William Ems, former employees of the United Railways, St. Louis, Mo., in connection with the loss of United Railways referendum petitions in June, 1918, have been *nolle prossed* by Assistant Circuit Attorney F. E. Williams at St. Louis. The cases were dropped by the Circuit Attorney's office because of the ruling of the Circuit Court at Springfield, Mo., during the trials of Richard McCulloch and Bruce Cameron to the effect that the referendum petitions had no value, hence could not be the objects of larceny. It had been anticipated that these cases would be dismissed.

Municipal Undertaking in Greenville.—Citizens of Greenville, Tex., in a referendum election on Dec. 18 voted to retain the city railway system and to operate it under municipal ownership. The property had been purchased by the city and there had been much agitation over the question of a municipally-owned automobile bus line to take the place of the railway. It was proposed to junk the line and equipment of the traction company and sell it for whatever it would bring and then to invest the proceeds in an automobile bus line, but the bus line proposition was rejected in the referendum and the railway will be retained. Greenville is the only city in Texas which owns its railway system.

Paving Question an Issue in Aberdeen.—Permission granted to the Grays Harbor Railway & Light Company,

Aberdeen, Wash., to use planking instead of paving certain street trackage in the city has been withdrawn by the City Council, following protests by property owners on Curtis Street, who contend that the company should stand street improvement expenses exacted of individual tax payers. The matter has been before the Council on two occasions. The latest development is a resolution adopted by the Chamber of Commerce, asking the city to re-issue the permit on the ground that the expense of regulation paving would prove a hardship on the company in its present financial condition. When asked to pave Curtis Street trackage to conform to other streets the railway filed a demurrer, alleging that the profits of the company for the past year had been small, and that the work could not be afforded.

Shopmen and Other Mechanics Seek Increase.—Col. A. T. Perkins, general manager under the receiver of the United Railways, St. Louis, Mo., has filed a number of exhibits with the Missouri Public Service Commission tending to show that the company is now paying its shopmen, electrical workers, painters, carpenters, bridge and structural iron workers, as high wages as the average paid in St. Louis. The employees enumerated are seeking an increase in wages of 45 per cent. All the rates requested are based on an eight-hour day with double pay for overtime and a half day off Saturday. The electrical workers are now working on a twelve-hour basis. Sixty cents an hour is the lowest rate asked and \$1 an hour is the highest. A former order of the court permits the State Public Service Commission to act as a board of arbitration in wage disputes. It is on the assumption that they will act in this case that the petitions have been filed.

Children "Kidded" in Vancouver.—The children of the office employees of the British Columbia Electric Railway, Vancouver, B. C., jammed the head office building of the company on the afternoon of Dec. 18 at the second Christmas entertainment held by the office employees' association of the company. Santa Claus arrived through the chimney and, with the help of Mrs. George Kidd, wife of the general manager of the company, distributed presents to every one of the 300 youngsters who filled the fourth floor of the building. There were four Christmas trees laden with presents. A fund of \$350 was raised by popular subscription from the office staff, to which the management of the company contributed generously. Then a committee bought presents for every child whose name was obtainable. Taking an active part in the festival also were George Kidd, general manager; W. G. Murrin, assistant general manager, other company officials and Mrs. Murrin. The festivities for the day were concluded with a dance for the older members of the official family of the company, including the employees.

Financial and Corporate

Big Gain in Net Income

West Jersey & Seashore Railroad
Changes from Deficit of \$85,000 in
1918 to a Profit of \$10,000 in 1919

The financial report of the West Jersey & Seashore Railroad for the year ended Dec. 31, 1919, showed a remarkable increase in all items. The revenue from the operation of the railway was \$11,971,021. This in comparison with \$10,599,543 in 1918 showed an increase of \$1,371,478, or 12.9 per cent. Railway operating expenses in-

creased to \$11,145,020. This was an increase of \$1,039,160, or 10.3 per cent, over 1918. In 1919 the net operating revenue was \$826,001, which, in comparison with \$493,683 in 1918, shows an increase of more than 67 per cent. With this increase in net operating revenue, the taxes being increased only about 19 per cent, the operating income for 1919 increased to \$245,968, or more than thirty-three times as much as in 1918.

The net income transferred to profit and loss, according to the income

statement of the federal operation, was changed from a deficit of \$85,369 to a profit of \$10,958, or a betterment by 112 per cent.

As previously mentioned, the West Jersey & Seashore Railroad was under federal control and the annual compensation paid for the possession, use and control of the property was \$952,682. This sum, together with other corporate income, gave a gross income for 1919 of \$1,212,433, or an increase over 1918 of 12.2 per cent. The net income, according to the income statement of the West Jersey & Seashore Railroad was \$698,859, an increase of only 1.8 per cent. This increase allowed a balance of \$22,877 to be transferred to profit and loss for 1919. In 1918 only \$13,412 was transferred, so an increase of 70.6 per cent was registered in 1919 in comparison with 1918.

14,762,658 REVENUE PASSENGERS

The total revenue passengers carried in 1919 were 14,762,658, or an increase of 1.1 per cent over 1918. The passenger revenue increased by 17 per cent, the revenue for 1919 being \$7,563,634. This increase in revenue was due to the fact that the average revenue per passenger increased from 44.3 cents in 1918 to 51.2 cents in 1919. This was an increase of 6.9 cents, or 15.5 per cent.

Suburban Line Threatens to Suspend

The Syracuse & Suburban Railway, which operates between the town of Manlius and the city of Syracuse, N. Y., will cease to operate unless something is done to reduce operating expenses and overcome burdensome franchise obligations.

C. Loomis Allen, vice-president of the road, consulted recently with John J. Stanley, Cleveland, the president of the company, about the situation. Subsequently he said the fate of the Syracuse & Suburban Railway was up to the people.

Letters telling of the tentative plans to suspend operations were forwarded to the town and village officers of Manlius, Fayetteville and Dewitt, stations on the suburban line, which supply the chief sources of revenue.

Various suggestions have been made by village officials and by citizens of the city of Syracuse, among them one to the effect that the salaries of the officers of the road be reduced. Mr. Allen said:

The matter is in the hands of the people. It is very simple. We are very barely earning our taxes and cannot increase our revenues. Fares are too high now. The only solution is to reduce expenses and the only way to do that is to get relief from burdensome franchise obligations and operating costs.

It has been intimated that bus line service will be established between the towns and city if the railway service is suspended. Mr. Allen stated that the company would voice no opposition to such action.

Included in the system of the Syracuse & Suburban Railroad are 18.5 miles of line.

INCOME STATEMENT OF THE FEDERAL OPERATION OF WEST JERSEY & SEASHORE RAILROAD

Year ended Dec. 31	1919	1918	Percentage Change Over 1918
Revenue from transportation.....	\$11,712,816	\$10,398,401	+12.6
Revenue from other railway operations.....	258,205	201,142	+28.4
Total railway revenue.....	\$11,971,021	\$10,599,543	+12.9
Way and structures.....	\$2,314,978	\$2,511,140	-7.8
Equipment.....	2,443,484	1,920,826	+27.2
Traffic.....	98,811	91,905	+7.5
Conducting transportation.....	5,961,368	5,284,564	+12.8
Miscellaneous operations.....	66,676	58,526	+13.9
General.....	260,165	238,912	+8.9
Transportation for investment—credit.....	462	13	.....
Total railway operating expenses.....	\$11,145,020	\$10,105,860	+10.3
Net operating revenue.....	\$826,001	\$493,683	+67.3
Taxes assignable to railway operations.....	\$578,874	\$483,383	+19.7
Uncollectable railway revenues.....	1,159	3,159	-63.3
Expenses assignable to railway operations.....	\$580,033	\$486,542	+19.2
Operating income.....	\$245,968	\$71,141	+33.40
Deductions from gross income:			
Net hire of equipment — Dr. balance.....	\$94,558	\$32,799	+188.2
Net joint facility rents — Dr. balance.....	156,805	143,262	+9.5
Net miscellaneous income — credit.....	16,354	83,551	-80.3
Total deductions from gross income.....	\$235,009	\$92,510	+153.9
Net income transferred to profit and loss.....	\$10,958	*\$85,369	+112.7

INCOME STATEMENT OF WEST JERSEY & SEASHORE RAILROAD

Year ended Dec. 31	1919	1918	Percentage Change Over 1918
Compensation accrued under federal control for possession, use, and control of property of this company.....	\$952,682	\$952,682	.....
Other corporate income.....	259,751	157,509	+88.9
Gross income.....	\$1,212,433	\$1,090,191	+12.2
Deductions from gross income.....	513,574	403,471	+27.5
Net income.....	\$698,859	\$686,720	+1.8
Disposition of net income.....	\$675,982	\$673,308	+0.4
Balance transferred to profit and loss.....	\$22,877	\$13,412	+70.6
Total amount to credit of profit and loss.....	\$408,977	\$375,938	+8.8

STATISTICAL INFORMATION — WEST JERSEY & SEASHORE RAILROAD

Year ended Dec. 31	1919	1918	Percentage Change Over 1918
Miles of single track.....	361.18	361.18	.....
Train miles:			
In passenger service.....	3,129,331	3,017,431	+3.7
By freight service.....	474,060	604,542	-21.6
Total revenue mileage run.....	3,603,391	3,621,973	-.5
Revenue passengers carried.....	14,762,658	14,603,466	+1.1
Passenger revenue.....	\$7,563,634	\$6,464,198	+17.0
Passenger revenue per cent of total operating revenue.....	63.18	60.99	+22
Passenger revenue per miles of line.....	\$20,941	\$17,897	+17.0
Average revenue per passenger (cents).....	51.2	44.3	+15.5
Average miles each passenger was carried.....	26.70	25.13	+6.2
Average number of passengers per car-mile.....	29	31	-6.5
Statistics per train mile:			
Operating revenue.....	\$3.32	\$2.93	+13.3
Operating expenses.....	\$3.10	\$2.79	+11.1
Net operating revenue (cents).....	22.9	13.6	+68.3
Number of passengers.....	4.10	4.03	+1.7
Train miles per revenue passenger.....	0.244	0.248	-1.6
Operating ratio (per cent).....	93.2	95.4	-2.2

\$34,674,000 Cut in Capitalization

Financial Readjustment Without Foreclosure Approved by Commission to Permit United Railroads to Meet Its Obligations

An order signed by the California Railroad Commission on Dec. 22 approved the reorganization plan for the United Railroads, San Francisco, Cal., proposed by the committee named to study the affairs of the railway. If the plan is carried out the present outstanding bonds, notes and stocks will be reduced from \$82,190,600 to \$47,516,000, or \$34,674,000. The indebtedness will be reduced from \$39,242,000 to \$15,366,000, or \$23,876,000. The capital stock will be reduced from \$42,948,600 to \$32,130,000, or \$10,798,600. The annual interest charges will be reduced from approximately \$1,815,000 to \$820,300, or \$994,700.

THE plan which has met with the approval of all but holders of \$603,000 of bonds, or 99.199 per cent of the security holders, calls for taking over of the United Railroads by the Market Street Railway and the issuance by the Market Street Railway of the following securities:

5% bonds due Sept. 1, 1924.....	\$10,166,000
6% notes due Sept. 1, 1924.....	5,200,000
6% prior preference stock.....	11,750,000
6% preferred stock.....	5,000,000
6% second preferred stock.....	4,700,000
Common stock.....	10,700,000
Total.....	\$47,516,000

The primary reason for the reorganization is given by the Railroad Commission in its review of the plan as inability by the United Railroads "to pay matured bonded indebtedness and interest on outstanding indebtedness."

The bonded and note indebtedness of the United Railroads is as follows:

Bonds	Amount Outstanding
Market St. Cable Co. 6s.....	\$1,800,000
The Omnibus Cable Co. 6s....	2,000,000
Ferry and Cliff House Co. 6s..	400,000
Sutter St. Ry. Co. 5s.....	1,000,000
Market St. Ry. Co. 5s.....	6,641,000
United R. R. 4s.....	23,500,000
S. F. Elec. Ry. 5s.....	191,000
Gough St. R. R. Co. 5s.....	45,000
Total.....	\$35,577,000
Notes	
Seven per cent.....	\$1,925,000
Six per cent.....	740,000
Five per cent.....	1,000,000
Total.....	\$3,665,000
Total bonds and notes.....	\$39,242,000

The bonds of the San Francisco Electric Railways, \$191,000, will be paid for in cash according to the reorganization plan, as will also the bonds of the Gough Street Railroad, amounting to \$45,000. The \$6,641,000 of Market Street Railway 5 per cent bonds will remain outstanding.

There are \$23,500,000 of 4 per cent United Railroads bonds outstanding. Under the reorganization plan, the holders of these bonds will receive 15 per cent in Market Street Railway 5 per cent bonds, 50 per cent in prior preference stock, 5 per cent in preferred stock, 10 per cent in second preferred stock and 20 per cent in common stock.

The holders of United Railroads notes and stock totaling \$46,613,600, will receive of Market Street Railway Company \$3,625,000 preferred stock, \$2,550,000 second preferred stock and \$6,000,000 common stock.

The commission points out that in 1918, the United Railroads reported

railway operating revenues of \$7,510,894; operating expenses \$5,031,683, giving a net operating revenue of \$2,479,210. Deduction of taxes amounting to \$408,000 left \$2,071,210, as operating income. In 1919 the operating income was \$2,054,397, the taxes amounting to \$468,800. The 1919 operating revenue was \$8,629,347; operating expense, \$6,106,149; net operating revenue, \$2,523,197.

Both the United Railroads' engineers and the commission's engineers filed an

appraisal of the properties. A. L. Black, for the company, fixed \$60,090,893 as the reproduction cost new of the properties as against the commission's appraisal of \$51,856,218, a difference of \$8,234,675. Against the commission's appraisal of reproduction cost new, less depreciation, of \$41,424,961, the company gives \$52,210,195, a difference of \$10,765,234. The commission's figure of \$30,806,514, historical cost new, is \$5,023,878 less than Mr. Black's figure under the same heading.

These differences are due to the use of different unit prices and to direct and overhead allowances. All appraisals are as of June 30, 1920. In estimating the reproduction cost new both the commission and the company assumed a three-year construction period and applied to the inventory what they regarded as average prices for the three-year period ending June 30, 1920. In arriving at the historical cost effect was given by the commission to the prices prevailing at the time the properties were built, in so far as such prices were available.

Losses Allowed to Be Amortized

Decision in Valuation and Rate Case of Gas Company Contains Many Important Points

Losses amounting to \$118,000 in the operation of the Nashville Gas & Heating Company since July 1, 1919, are permitted by the Tennessee Public Utilities Commission to be amortized over a period of ten years and a fair return under present conditions is fixed by the commission at not to exceed 7½ per cent and not less than 6½ per cent on the value of the property devoted to the public use. These are among some of the outstanding features of a decision rendered recently in a gas rate case of more than passing interest.

ANOTHER feature of the opinion is the attention directed by the commission to the fact that for every \$1 that the consumer pays to the company for gas during 1921 the city of Nashville will get approximately 12 cents and the company 88 cents. The commission points out that this is a matter over which it has no control, but that so long as the city demands and collects these amounts as taxes the commission can under the law only allow them to be charged to operating expenses. This, of course, results in the payment being made indirectly by the consumer.

The rates for gas as fixed under the order are \$1.90 gross per 1,000 cu.ft. and \$1.80 net, the net rate to apply only to the patron who pays his bill within ten business days after the bill is rendered.

Experts made three estimates of the value of the property of the company. These were \$2,508,665 as historical cost less depreciation, \$3,569,990 as cost to reproduce new less depreciation based upon average prices for 1915-1919, and \$4,655,380 as the cost to reproduce new less depreciation based upon present prices. The value as fixed by the commission is \$2,650,000.

On this point the commission says that the public should not be made to bear the entire burden of the abnormally inflated present day prices of both labor and material as a rate of return

upon a value reached alone by such method would be prohibitory. On the other hand, the company should not be made to bear the burden of too low a valuation based upon an estimate of its original cost less depreciation, as a return upon a value reached alone by such a method might prove confiscatory.

No dividends have been paid by the company since its reorganization in 1912; neither has the company earned interest on its bonded indebtedness of \$2,000,000 since that date. Interest on the bonds for the period mentioned was \$833,333 and net earnings for the period \$722,862, making the deficit \$110,471.

The company is directed to reinforce its service in the outlying residential districts so as to furnish an adequate and even flow of gas at all times, with its first available earnings over and above the 6½ per cent return per annum on the investment and the amount set out with which to amortize its losses since July 1, 1919, and is to pay no dividends until this work is finished.

The company is directed to establish and maintain a depreciation or renewal and replacement reserve, said reserve to be credited each month with 1/10 of 1 per cent of the value of the depreciable property of the company as of April 1, 1920, plus such amounts as have been or may be added and minus such amounts as have been or may be deducted after April 1, 1920.

Receiver in Denver

Ernest Stenger, Successor to Mr. Hild as Operating Head of Tramway, Named Under Court's Direction

On application of the Westinghouse Electric & Manufacturing Company made Dec. 24 Ernest Stenger, president, was appointed receiver for the Denver (Col.) Tramway by Judge Lewis of the Federal court. The application was premised on an overdue account of the Westinghouse Company for \$13,577 incurred for materials and supplies furnished the tramway, which was unable to pay.

The application for the receiver sets out that the company has overdue and unpaid bond and note interest aggregating \$346,800; delinquent and unpaid taxes in Denver County of approximately \$95,000; unpaid and overdue accounts for materials and supplies in a sum in excess of \$150,000, and in addition has no funds with which to meet taxes, approximately \$300,000, payable in 1921; that the operating expenses, due largely to increases in wages of employees and costs of materials, during the year 1919 were more than 100 per cent greater than prior to the war and that wage increases alone were more than \$1,000,000 a year greater than before the war, while the fare increase had been only 20 per cent, with the result that for the year 1920 the company's net earnings were less than half the fixed charges on the property.

As a result of these conditions the earnings for the year 1920 will be less than 3 per cent on the valuation of the property as found by the Public Utilities Commission of the State of Colorado and approved by a committee of fifty-five representative citizens of Denver. On account of the company's inability to obtain higher fares the continued operation of the properties as a unit and the rendition of proper service to the public is seriously threatened and crippled and the financial situation and conditions are such that the applicant company felt a receiver should be appointed so that the court may fully administer the property and funds of the company.

Receiver Stenger made no comments on his appointment or the future policies of the company other than to say that for the present there will be no material changes in either the personnel of the company or in the compensation and wages paid.

100,000,000 Passengers During 1920

One hundred million passengers will have been carried over the lines of the Pacific Electric Railway, Los Angeles, Cal., at the close of the year 1920, according to estimate given out by H. B. Titcomb, vice-president of the interurban company. This estimate, Mr. Titcomb states, is based on the actual volume of traffic that has been handled during the first ten months of the current year, and will constitute for the year 1920 the greatest volume of busi-

ness handled in the history of the company. The highest previous mark was made in 1913. In that year 83,000,000 passengers were carried.

While reflective to a degree of the greatest increase that has been made in the population of Southern California, Mr. Titcomb points out that comparative figures of the past few years cannot be taken as a true index of increases in population. This, he explains, is due largely to the advent of the automobile, which has made heavy inroads on electric railway transportation.

The Pacific Electric, it is pointed out, up to and including the year 1913, showed a steady and consistent increase in volume of traffic handled. Beginning with the year 1914, however, the popularity of the automobile brought about a decrease in both urban and interurban railway traffic which continued until, for the year 1918, the volume carried over the interurban company's system had dropped to a total of 77,500,000 passengers.

Mr. Titcomb states that the figures of the current year are perhaps more truly indicative that the peak in automobile transportation has been reached. He is of the opinion that rising costs of automobiles and of gasoline have been so greatly out of proportion to such increases as have come about in electric railway fares that he is firmly of the belief that electric railways will have little hereafter to fear in obtaining their just proportion of the increased travel.

St. Paul Valuation Protested

Exception to the valuation of \$11,000,000 placed on the property of the St. Paul (Minn.) City Railway and filed with the City Council by E. W. Bemis is taken by President Horace Lowry, of the Twin City Lines, of which the St. Paul line is a subsidiary. The company has been paying taxes on a valuation of \$16,000,000. Mr. Lowry made a statement as follows:

The Bemis report is apparently very carefully prepared, but from the company's standpoint we are unable to agree that the principles are fair which he has used in arriving at his figures. Our valuation of the property is pretty well expressed by the fact that for several years we have, without protest, paid taxes on a valuation in excess of \$16,000,000. It is needless to say that if we figured the property to be worth less money we would have contested paying taxes on this valuation, even to the extent of going into the court.

We have not at hand the full details of Dr. Bemis' report, which are promised at an early date, but as we interpret it the net result of this report is that the company is not at this time even earning the return on the low valuation of \$11,000,000, which he has placed on the property, and that the company cannot be expected to make any extensions or undertake any reconstruction or paving until conditions are changed through a readjustment of the rate of fare.

Dr. Bemis feels that a few more weeks should elapse in order to analyze the earnings and expenses under the present 6-cent fare and at that time proposes to re-open the entire question and states that at that time he will make a definite recommendation as to the rate of fare and return on the investment.

At that time the entire question will be re-opened and our company will be prepared to present to the St. Paul City Council its valuation of the property. We believe we can establish a value materially in excess of that proposed by Dr. Bemis.

Financial News Notes

Sale of Real Estate Postponed.—Sale of the real estate of the New York (N. Y.) Railways under foreclosure of the first real estate and refunding mortgage, has been postponed until Feb. 2, 1921, to await action in the United States District Court.

Vermont Company to Increase Stock.—The Burlington Traction Company, Burlington, Vt., has voted to increase its capital stock from \$200,000 to \$400,000. The company has filed with the Secretary of State a certificate certifying that the additional will consist of 2,000 shares of a par value of \$100 each.

Sale for Taxes Threatened.—Harvey P. Cole, collector of taxes for the town of Williamstown, has announced that property owned by the Berkshire Street Railway at Williamstown, Mass., will be offered for sale at public auction on Jan. 8, for the purpose of obtaining payment of taxes owed the town by the company. The amount is \$1,216, covering a period of three years.

Change in Tax Basis Suggested.—One of the measures of relief under consideration by Congress for extension to the Washington Railway & Electric Company and other lines in the District of Columbia is the placing of a tax on the net earnings of the railways instead of on the gross earnings as at present. This, it is estimated, would relieve the Washington Railway & Electric Company of \$300,000 in charges.

Equipment Notes for One Car.—The Department of Public Utilities of Massachusetts has authorized the receiver of the Brockton & Plymouth Street Railway, Plymouth, Mass., to issue thirty-six notes aggregating \$6,360 for the purpose of purchasing a one-man car under a conditional sale contract, the notes to mature at monthly intervals and to be in addition to a cash payment already made in connection with the purchase.

Receiver in Raleigh.—J. R. Baggett, Wilmington, N. C., has been appointed temporary receiver of the Cumberland Railway & Power Company, Raleigh, N. C. After a meeting with the directors of the company Mr. Baggett issued a statement to the effect that with co-operation on the part of officers, directors and bondholders the outlook was good for placing the properties on a paying basis.

Plum Island Line to Be Abandoned.—Operation of the Plum Island division of the Massachusetts Northeastern Street Railway, Haverhill, Mass., will be suspended at once, it is announced, and the tracks taken up. The line connects Newburyport and the island and

is the only means of communication for the large number of cottagers who spend the summer at the island. It has not paid expenses for some time.

A \$1,500,000 Tax Levy Proposed.—A bill recently introduced in the City Council of Seattle, Wash., by Councilman Carroll, provides for an annual tax levy of not to exceed \$1,500,000 to aid in the maintenance and operation of the Seattle Municipal Railway. It provides for submission of the question to the voters at the general election on March 8. The bill was referred to the committee of the whole.

Losing \$2,000 a Day.—The United Traction Company, Albany, N. Y., is now operating at a loss of \$2,000 a day, according to a recent statement by the company. The deficit for the eleven months ending Nov. 30 is more than \$371,000, and the accumulated deficit to that date amounts to nearly \$700,000. The company some time ago applied to the Public Service Commission for the Second District for authority to raise its fare from 7 cents to 10 cents.

Webster-Putnam Service to Stop.—The Webster-Dudley Chamber of Commerce has received a letter from the Worcester (Mass.) Consolidated Street Railway and the Connecticut Company stating that the lines between the towns of Webster and Putnam are not to be continued. Both companies claim that the present income on lines in the territory adjacent to Putnam is not producing enough revenue to pay wages of operation.

Local Lines at Findley Appraised at \$206,493.—The city system of the Toledo, Bowling Green & Southern Traction Company at Findlay, Ohio, is worth \$206,493, according to a report filed by appraisers of the State Public Utilities Commission. The appraisers report will be used in drafting a service-at-cost franchise to supplant the present franchise, under which the company claims it is losing money. An application to discontinue service is now pending before the utilities commission.

How One Municipal Line Makes a Showing.—Through the charging of inadequate fares on the so-called Civic Lines, the city of Toronto, Ont., has been responsible for annual deficits ranging from \$78,000 to \$146,000. Thomas Bradshaw, ex-finance commissioner of Toronto, told the Chartered Accountants' Students' Association of Ontario. These deficits have been charged up against the general tax rate. In addition, the city has failed to provide for depreciation or taxes on the property.

Mayor Approves Mr. Feustel's Retention.—Mayor Moore of Philadelphia, Pa., has signed a contract with Robert M. Feustel, for services in preparing and presenting before the Public Service Commission the city's case in the Philadelphia Rapid Transit Company valuation proceedings. Mr. Feustel was engaged by the Department of City Transit as the city's representative in

checking up the inventory and valuation of the railway property. Reference to the appointment was made in the ELECTRIC RAILWAY JOURNAL for Oct. 9, page 738.

Bonds Extended with Increase in Interest.—The Department of Public Utilities of Massachusetts has approved the extension of maturity date for five years from Jan. 3, 1921, of the \$115,000 twenty-year first mortgage 5 per cent gold coupon bonds assumed by the Worcester Consolidated Street Railway from the Worcester & Clinton Street Railway. The interest rate is increased to 7 per cent. The existing financial conditions prevented refunding by a new issue, and the increase in the interest rate is necessary to secure the consent of noteholders to the extension.

New Hampshire Town Votes to Buy Road.—The citizens of Hampton, N. H., have voted to purchase the Exeter, Hampton & Amesbury Street Railway, at a cost not to exceed \$80,000, with the understanding that if the road failed to pay expenses the town of Exeter would make an annual contribution of \$2,500 for a term of five years. The road connects Hampton with Exeter, Hampton Falls, Hampton Beach and Smithtown in N. H., and Amesbury, Mass., operation being over about 20 miles of track. It was built in 1897.

Unscrambling Impossible.—State Public Utilities Commissioner Joseph W. Alsop, in an address at Hartford on Dec. 20, said that the "unscrambling of the Connecticut Company is impossible under the trusteeship plan." He said that the company did an entirely intrastate business, but was virtually not under the control of the State because of its management by federal trustees. He stated \$40,000,000 in stock certificates was represented in the Connecticut Company and it would be impossible under the trusteeship for the trustees to sell the road.

Hyde Park Bill Passed by House.—The Massachusetts House has passed to be engrossed a bill authorizing the Boston Elevated Railway to begin operation at once on the Eastern Massachusetts Street Railway lines in Hyde Park. The bill provides a payment of \$30,000 by the city of Boston to the Boston Elevated Railway in order that tracks approaching Hyde Park Avenue may be put in satisfactory condition, and the city also guarantees to make up any deficit in operating expenses on the new line. The city has been ready to pay this money for months, but was unable to do so because of irregularities in a bill passed in the regular session. These irregularities are corrected in the new bill.

Decrease Reported in Spokane in November.—Despite the fact that 72,044 more passengers were carried by the Washington Water Power Company on its city lines in Spokane, Wash., in November, 1920, than in the same month of 1919, the net revenue declined practically \$5,000 according to the report made to Mayor Fleming. The gross receipts increased from \$55,-

\$86,886 to \$90,531 while operating expenses increased from \$55,156 to \$62,147. The income with the operation charges deducted was \$28,383 last month as against \$31,729 in the same month last year. Taxes and replacement reserve last month were \$21,272 as compared with \$19,724. The net earnings last month were \$7,111 and in November, 1919, \$12,005.

Standard Traction Absorbed.—The Dallas (Tex.) Railway effective on Dec. 1, took over the Standard Traction Company, which had been operating in the Mount Auburn and Parkview additions to the city, connecting with the lines of the Dallas Railway, to which transfers were issued. Under the new arrangement through service will be operated from the business district on both lines with new one-man cars. Twelve of the new cars will be used and a 7½ minute schedule will be maintained. The Standard Traction Company agreed to turn over to the Dallas Railway its property and bonus of \$30,000 cash offered for the construction of a line to the two additions via Lindsley Avenue. The Dallas Railway has accepted this offer contingent on the city granting a new franchise. The proposed line would cost about \$100,000.

Rental Case to Be Appealed.—Berne H. Evans, counsel for the Public Service Commission of Pennsylvania has announced that the commission would join with the city and business associations in an appeal to the Supreme Court from the decision rendered by the Superior Court in the case of the rentals of the underlying companies included in the system of the Philadelphia Rapid Transit Company. The Superior Court set aside an order of the Public Service Commission which required the underlying companies to reply to the complaint that the rentals they received from the Philadelphia Rapid Transit Company were "excessive and unjust." The Public Service Commission, it was announced, will defend the right of the commission to regulate rentals that have a direct bearing on the rate of fare exacted from the public by the Philadelphia Rapid Transit Company.

Court to Fix Priority of Liens.—In the United States court at Savannah Judge Beverly D. Evans heard the intervention of the city of Brunswick, Ga., in the case of the Columbia Trust Company vs. the City & Suburban Railway, under which the railway at Brunswick was placed in the hands of a receiver about a year ago. The intervention was for the purpose of having the railway's pro rata part of paving costs on streets occupied by its tracks declared a lien on its property. After a short hearing on the intervention Judge Evans announced that he would take the matter under advisement and render his decision later. There was a general discussion of the affairs of the railway, which has been operated at a loss. Various suggestions were made to solve the question so that there might be no necessity for scrapping the system.

Traffic and Transportation

Autos Killed 7,969

Deaths Resulting from Automobile Accidents in Territory Registered by Census Shows Increase

A total of 3,808 persons were killed in automobile accidents or died as a result of such accidents in sixty-six of the larger cities of the country in 1919, according to a compilation recently made public by the Bureau of the Census, Department of Commerce, Washington, D. C. The total number of deaths resulting from automobile accidents throughout the territory registered by the Census Bureau, representing about 80 per cent of the population of the United States, was 7,969. The rate per 100,000 of population in the registration area has not been determined, but the rate for the sixty-six cities is placed at 14.1.

ALARMING INCREASE SHOWN

The Census Bureau's statement points out that this death rate of 14.1 for the cities represents an increase over that for every year since 1915, when the rate was 8.0 per 100,000, and an increase of 245 in the total number of deaths over 1918. It declares that the number of persons killed each year in automobile accidents has reached alarming proportions, and urges that prompt measures be taken to protect pedestrians from reckless motorists. The following suggestions are made for reducing the number of accidents:

1. At street crossings the erection of curbed safety islands, which, at the most dangerous spots, should be very close together.
2. Construction of additional crossings in the middle of blocks, where automobiles can approach from only two directions.
3. Demonstration of great skill in driving each machine before granting a driver's license for that machine.
4. Reduction of the speed limit, especially at crossings.
5. Fine, revoking of license, and imprisonment, each to have its place as an actual penalty.

Referring to the increase in the number of fatalities, the bureau's statement says:

Each year the death rates from automobile accidents are higher than the rates of the previous year. Each year it becomes more and more dangerous for a person to walk the streets. The reason usually given, and probably the correct one, is that the number of automobiles in use is constantly increasing. How then shall this ever increasing danger be lessened? The obvious remedy is to improve constantly the traffic regulations to keep pace with the ever increasing number of automobiles.

STRICTER REGULATION NEEDED

This call for better and better traffic regulations is not a fanciful one. Everyone is familiar with the necessity for slow and orderly progress when a crowd emerges from a circus tent and, similarly, automobile traffic must be slowed down and controlled until it becomes safe.

The 1919 rates for Kansas City, Mo., San Antonio and Cleveland—all much lower than for 1918—furnish a ray of hope that we are finally waking up.

The tendency of some writers to exonerate automobile drivers and to place the

blame of accidents upon pedestrians indicates lack of a full comprehension of the problems involved.

The teaching of caution is admirable and in time pedestrians will undoubtedly become more and more careful, but there will always be on our streets the person who misjudged the speed of an approaching automobile and becoming confused knows not which way to go; there will always be the child who has not yet acquired the ultra-cautious habit, and there will always be old people who cannot hear and see so well as they used to and who are not so keen and active as they once were. The preaching of more caution to these people will never be sufficient. They must be protected by additional safeguards, and city governments which will continue to make their traffic regulations more and more rigid till they can point to low death rates from automobile accidents will deserve the commendation of all thoughtful people.

YOUNGSTOWN'S RATE 28.5 PER 100,000

Youngstown, Ohio, heads the list of sixty-six cities in the automobile death rate with 28.5 per 100,000, but shows a decrease from the previous year, when the rate was 31.9. Richmond, Va., had the lowest rate with 5.9, but showed a slight increase over 1918, when it was 5.4. New York had the largest total number of deaths with 780, an increase of 89 over the previous year and more than double the number in 1915. New York's automobile death rate was 14 per 100,000 persons. Chicago's total deaths numbered 328, an increase of 37, with a death rate of 12.3.

Statistics compiled by the bureau for other cities of 250,000 or more population follow:

Philadelphia total 191, decrease 35, rate 10.6; Detroit 139, increase 14, rate 14.4; Cleveland 126, decrease 42, rate 16.0; St. Louis 105, increase 12, rate 13.7; Boston 125, increase 17, rate 16.8; Baltimore 106, increase 4, rate 14.6; Pittsburgh 94, decrease 11, rate 16.1; Los Angeles 119, increase 28, rate 21.1; San Francisco 85, increase 11, rate 16.9; Buffalo 68, decrease 22, rate 13.6; Milwaukee 60, increase 12, rate 13.2; Washington 58, increase 4, rate 13.4; Newark 82, increase 20, rate 20.0; Cincinnati 67, increase 8, rate 16.7; New Orleans 36, increase 8, rate 9.4; Minneapolis 38, decrease 5, rate 10.1; Kansas City, Mo., 42, decrease 22, rate 13.1; Seattle 50, increase 10, rate 16.0; Indianapolis 26, decrease 1, rate 8.4; Jersey City 40, increase 10, rate 13.5; Rochester 32, increase 7, rate 10.9; Portland, Ore., 31, no change, rate 12.1; Denver 41, decrease 2, rate 16.1.

Five Cents a Mile

The Public Service Commission for the Second District has authorized the Southern New York Power & Railway Corporation, Cooperstown, N. Y., to file a new passenger tariff, effective on five days' notice, establishing cash, ticket and mileage fares at rates not exceeding 5 cents a mile for travel between Mohawk and Oneonta, excepting in Oneonta. If the company discontinues the sale of mileage books now in use or increases the mileage rate, outstanding mileage books will be redeemed if presented for redemption before the expiration of the book. The increase authorized is for one year or until another order by the commission makes the rate inoperative.

Seattle Increase Soon

Municipal Railway Will Raise Token Rates on Jan. 8—One Councilman Proposes Free Rides

Token fares on the lines of the Seattle (Wash.) Municipal Railway will be increased from 6½ cents to 8½ cents on Jan. 8 by the terms of an ordinance recently passed by the City Council. The new rates provide a cash fare of 10 cents as at present; token fares, 8½ cents or three for 25 cents, six for 50 cents and twelve for \$1. Fares for school children remain at the present rate: single cash fare, 3 cents; cash fare for two children, 5 cents; school tickets, ten for 25 cents, or 2½ cents each. Former service men under jurisdiction of the Federal Board for Vocational Training will pay the same rates as school children.

Passengers who pay cash, tokens, or school-ticket fares will be entitled to transfer privileges, except that transfers will be issued to the Seattle & Ranier Valley Railway only upon payment of the cash fare of 10 cents. An additional fare will be charged on the Highland Park and Lake Burien line operated by the city for transportation to points outside the city limits, according to D. W. Henderson, superintendent of the municipal railway system.

Mr. Henderson estimates that the increased fares will bring the municipal system to a point where there will be a surplus of \$230,000 at the end of 1921. The estimate is based on the assumption that the average number of passengers a month in 1921 under the increased fare will be 7,366,634, the average number which rode on the car lines in August, September and October of this year.

FREE RIDES SUGGESTED

A proposal will shortly be submitted to the City Council by Councilman Oliver T. Erickson, chairman of the judiciary committee, providing for the establishment of a 2½-cent or 3-cent fare on the Seattle Municipal Railway and for the eventual doing away with fares entirely. Mr. Erickson has asked the Corporation Counsel to prepare an amendment to the city charter to put his plan in operation.

Mr. Erickson says the fare would include not more than 1½ cents to be set aside in an extension and depreciation reserve fund for extensions and track and equipment purposes, to be expended by the Council. All other costs of operation and maintenance would be paid from the general fund, increasing the general tax levy about 2 per cent. With the retirement of all outstanding bonds and debts, the collection of this fare would be discontinued, and all costs of construction, operating and maintenance paid from the general fund. Mr. Erickson has long been interested in municipal ownership of the traction system. He believes that the time is approaching when the payment of fares on municipal transportation systems must go the way of tolls on roads and bridges.

One Cent for Transfers in Indianapolis

Commission Grants Railway an Additional Charge for Trial Period— Company Looks for \$150,000 Increase in Revenue

The Indianapolis (Ind.) Street Railway on Dec. 20 began charging 1 cent for each transfer, in accordance with an order of the State Public Service Commission issued on Dec. 18. The 1-cent transfer charge was authorized by the commission for a trial period of seventy-one days. In its order the commission intimated that, if the results of operation under the new plan proved unsatisfactory, further relief would be forthcoming. The basic nickel fare was retained as being in the best interest of the community. The company had applied for a 2-cent transfer charge and for an increase in the amounts paid it for the use of the city tracks and for terminal facilities by the interurbans entering Indianapolis. Hearings on the original and supplementary petitions were held by the commission, as reported in the issue for Dec. 18, page 1262. It is estimated by the commission that the 1-cent transfer charge will add \$182,000 a year to the revenues of the company. The company's estimate is approximately \$150,000.

IN granting the 1-cent charge the commission stated that it sought the most equitable method of relieving the company. With reference to its policy toward the city and the railway, it said:

The company, from the standpoint of its financial organization and fixed charges, is on a safe and sound basis. For more than two years the company has been very closely regulated by this commission. Methods of operation have been changed at the direction of the commission. Economies and efficiencies have been effected and adopted. Under orders of this commission, great improvement in service has been made. New equipment has been added, and the service of the company greatly improved. Needed extensions of lines have been made at the request of this commission. For more than two years this company has made every effort to conform to its obligations as an agency of public service. * * * The citizens of Indianapolis, by the economies and management of the company, have been saved millions of dollars in street car fares as compared to the citizens of the large number of other similar sized cities in the United States.

COMMISSION BACKS RAILWAY

In view of all this the commission desires to emphasize the fact that during the period of its jurisdiction it intends to stand behind this company to the full extent of the commission's power to maintain the solvency and credit of the company and to protect its property and interests, provided that the company continues to exercise its best efforts to meet the legitimate demands of the public.

The commission also finds it desirable to state to the city that its legitimate needs may be taken care of. The commission will recognize, and in revenues provide for, current market rates for money so demanded for public use. * * *

The responsibility having been placed on the commission by mandate, the commission may not sit idly by if unwarranted demands are made either in the matter of extensions and improvements or rates for money. * * *

The commission states that it has accepted for its guidance for emergency purposes, "the broad latitude or value between \$14,000,000 and \$16,000,000." In submitting, in 1920, a service-at-cost proposal, the city of Indianapolis offered to agree, for such purposes, to a value of \$15,000,000. On a 7 per cent basis, \$15,000,000 valuation would have called for fixed charges of \$1,050,000, as compared with \$989,380. In its proposal for service at cost the city included as a part of the cost of service a return on the value of the property put to public use. The commission, therefore considers itself "amply assured that no unfair burden

is placed on the public served if recognized as valid and justified the listed \$989,360 of fixed charges for 1921."

After reviewing the results obtained by the railway under the basic nickel fare, the commission continues:

Having accomplished these remarkable results, it is not wisdom for the utility, city, or the commission to depart from such policies. It may be that a 2-cent transfer, or even a higher basic fare will be proven to be necessary, but the commission is of the opinion that, especially under this interlocutory order, the possibilities of the 1-cent transfer should be ascertained in a brief experimental period extending through January and February. It is possible that new conditions affecting both operating costs and revenues may be more clearly discerned and understood early in the year 1921.

The commission, in the order issued on Dec. 18, does not pass on the supplementary petition which raised the question as to whether the interurban companies are paying enough to the local company for power, track rental and terminal facilities. It found this question too complicated and the evidence too incomplete to pass upon at this time. It is intimated that a technical investigation may be ordered by the commission. The commission found that the local freight terminal facilities were inadequate, and has ordered the Indianapolis Street Railway to submit on or before Feb. 1, next, plans for improvements to be carried out by itself or the interurban companies.

Another Vote on Duluth Fare

By a vote of three to two the Council of Duluth, Minn., on Dec. 24 adopted a resolution authorizing a special election to be held on Feb. 3, when the citizens will again vote on an ordinance to grant the Duluth Street Railway a 6-cent fare. The proposed ordinance provides that it will be inoperative after two years from its adoption by the people, and may be terminated after one year. In brief, it provides for a 6-cent fare, for continuation of the present wage schedule of the railway's employees, for an improved service schedule and for the company to make such street improvements, as are in the opinion of the City Council found necessary.

The City Council also adopted a reso-

lution placing the entire burden of the election and its incidental expenses upon the company and requiring the latter to deposit a check for \$4,000 with the City Treasurer before Dec. 30 as a guarantee. The expenses of the election were estimated at \$3,500.

The Council recently decided to force the railway to improve its service under sections nine and eleven of its franchise, which provide the city with power to regulate operation and management of the lines and to prescribe the number of cars which shall operate over any line. City Attorney John E. Samuelson had previously advised the Council that the company's complaint that it could give no better service on a 5-cent fare was not a valid excuse and that the company should fulfill its contract.

Railway Should Operate Buses, Says Connecticut Official

Operation by the Connecticut Company, of buses to supplement its trolley service was advocated by Lieutenant-Governor Clifford B. Wilson of Connecticut in an address at a recent meeting of the Get-Together Club of Hartford. The Lieutenant Governor, who is also Mayor of Bridgeport, declared that in time motor buses might replace the present electric railway system, but that, since the transportation business is monopolistic by nature, development of the bus idea should be undertaken by the railway.

It was pointed out at the meeting that the incoming Legislature would be called upon to abolish the state tax on gross receipts, paving taxes and the bridge taxes. Harrison B. Freeman, receiver of the Hartford & Springfield Street Railway, stated that a 10-cent fare was "about the limit" and that it was inadvisable to raise the rate above that point.

Public Utilities Commissioner Joseph W. Alsop told the gathering that the Connecticut Company's system cannot be split up as long as the company is in control of trustees appointed by a Federal court. In pointing out the status of the company, Commissioner Alsop said that the company did an entirely intra-state business but was virtually not under the control of the state because of its management by the trustees.

Lieutenant Governor Wilson summed up his remedies for the state's transportation situation as follows:

1. Retain the corporate entity of the trolley company.
2. Keep your transportation system monopolistic, but with proper regulation and control.
3. Permit the trolley company to operate motor buses.
4. Let the period of transition from the trolley to the motor bus be gradual as it is inevitable.
5. Let the experience of each community work out the destiny of its transportation system.
6. Do not operate as an entity for the whole state.
7. Let suburban lines be actually what they were intended to be, namely, competitors of steam roads, placing them on a mileage basis if necessary.
8. Readjust the system of state taxation and permit the towns to assess along with other property an equal proportion of the burdens of the town in which the physical properties of the company are located.

Safety Preached in Schools

The public school safety campaign is again on in Portland, Ore., under the direction of the National Safety Council. Co-operating in this work is the Portland Railway, Light & Power Company, which has heartily approved of the methods and plans of Portland's public schools in the campaign for the conservation of human life.

Much has been said regarding the efficient manner in which the pupils have been instructed in "safety first" during the past ten years in that city, but a departure was instituted this year

Much interest is manifested by principals and pupils to "keep the slate clean" and the psychological effect upon the child, as he examines the chart daily, is a constant reminder to him.

This chart was produced under the direction of Harry P. Coffin, manager of the public safety section of the National Safety Council, Oregon Division.

Seven Cents in Birmingham

Acting on the petition of Lee C. Bradley, receiver of the Birmingham Railway, Light & Power Company, Birmingham, Ala., the State Public

herited" a number of debts when he took over the property, and maintained that while he had largely increased the indebtedness, the money expended had been used for capital investments. The city maintained that the 6-cent fare, which has been in effect for about a year, would give a proper return on the investment and claimed that the debts for what the city claimed were capital investments, should be paid by the owners of the property.

Immediately following the announcement of the decision granting the company the right to charge a 7-cent fare, J. S. Pevear, general manager of the company, stated that everything was in readiness to put the increased rate in effect. The only formality necessary was an order of Judge W. I. Grubb.

Estimates by city officials place the added revenue, which will result from the increase, at \$300,000 per year.

Interurban Decision Deferred

In awarding the 1-cent transfer charge to the Indianapolis Street Railway, the Public Service Commission of Indiana has authorized the Union Traction Company of Indiana to increase the fare between Indianapolis and Broad-ripple from 5 to 10 cents. Fares for rides between the down-town district and Forty-sixth Street, which is over the tracks owned by the Indianapolis Street Railway, will remain at 5 cents, and from Forty-sixth Street to Broad-ripple (over tracks owned by the Union Traction Company) the fare will also remain at 5 cents. Tickets will be sold at six for 50 cents. This order is effective Jan. 1. Petitions of the interurban companies for increased fares within the city were continued by the commission to provide time for readjustment of contract relations with the city.

The commission finds that the practice of the interurban companies in charging a city fare of 5 cents while at the same time interurban passengers are charged a fare of 3 cents a mile in the case of regular passengers and 1.78 cents a mile in the case of commuters, is discriminatory in favor of the city passenger. The commission also holds that the evidence does not disclose any essential difference in transportation over mileage within and without the city which could be expected to be reflected in the rate, and that therefore the discrimination cannot be removed by reducing the interurban fare within the city.

The commission states that the 5-cent fare has been charged because of a franchise agreement with the city of Indianapolis which is still in force. Because of the fact that the interurban companies have not surrendered their franchises as provided by law the commission holds that its jurisdiction is debatable. Therefore the commission believes that these interurban companies should go to the city officials and endeavor to have the provisions of their franchise changed so as to permit of the charging of a higher fare.

PORTLAND PUBLIC SCHOOLS Traffic Accident Chart 1920-1921

SAFETY FIRST! STOP! LOOK! LISTEN!

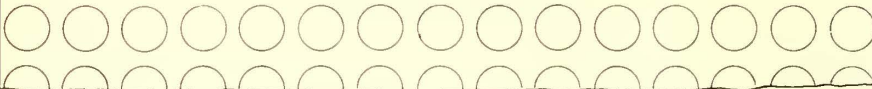
Let us put the Axe in Accidents by Keeping this Slate Clean

Remember That a Red Disk in a circle below represents an accident to a pupil of the school indicated thereon

Holladay School



All Other Schools



Let no Red Blot mar this Escutcheon

Observe the rules for your safety. Never cross the street before looking both ways and then only at regular crossings. Avoid jumping on moving street cars or hitching on automobiles. Playing on unroped streets may cause you an accident. REMEMBER that an ounce of forethought is worth several pounds of substantial regret.

"He is free from danger who, even when safe, is on his guard."—CYRUS

TRAFFIC-ACCIDENT CHART FOR USE IN PUBLIC SCHOOLS

by putting into each school a traffic-accident chart illustrated in the accompanying engraving. This chart is presented to the school by the "prominent" citizen giving the lecture on safety with the admonition to the pupils to "keep the slate clean."

The chart is provided with circles in which red discs will be placed whenever there is an accident to a school child. These red discs are the size of the circles and will be printed with the name of the school to which the unfortunate pupil belonged and the date of the accident. The discs will be sent out from the office of the superintendent of schools with instructions to paste them on the chart. The school whose name appears on the disc will attach it in the circles reserved for that school, otherwise it would be pasted below. Information of a safety nature appears in the chart.

Service Commission on Dec. 22 authorized an increase in fare to 7 cents on the Birmingham lines beginning Jan. 1.

The increase in fares was vigorously resisted by the City Commission. J. Ellis Brown, Commissioner of Public Utilities of the city of Birmingham, stated, following the announcement of the decision, that the city will ask for a reduction of fare to 6 cents.

Under the terms of the commission's order the 7-cent fare was granted for a period of one year. The petition of the receiver asked for the increase as an emergency measure. He showed at a hearing before the Public Service Commission on Dec. 21, that the company had been largely increased under the receivership.

The city of Birmingham maintained that the company was not entitled to the increase as a matter of "right." It showed that the receiver had "in-

Transportation News Notes

Parents Asked to Warn Children.—The Duluth (Minn.) Street Railway is conducting an advertising campaign in the local newspapers to educate the public against coasting accidents. The ads call attention to the fact that coasting accidents have already occurred and that narrow escapes are reported daily. Parents are asked to warn their children against coasting across car tracks.

Wants More in Ithaca.—The Ithaca (N. Y.) Traction Company has applied to the Public Service Commission, Second District, for authority to charge a fare of 10 cents in all municipalities in which it operates, effective on short notice. The company submits statements and alleges that the present 7-cent fare is insufficient to yield reasonable compensation for the service rendered.

Must Charge 5 Cents.—Judge J. B. Hutcheson has denied a motion of counsel for the Georgia Railway & Power Company, Atlanta, Ga., for a writ of supersedeas to allow the company to raise its fare from 5 cents to 7 cents on its line in Decatur. Some time ago Judge Hutcheson enjoined the company from charging a 7-cent fare and giving passengers 2-cent rebate receipts, as is being done in College Park under the terms of a supersedeas issued by Judge Pendleton.

Central Association Reissues Tariffs.—The Central Electric Traffic Association is reissuing theatrical baggage tariffs with additional rules and change of rates. Joint passenger tariffs in Indiana are also being reissued to conform to change in rates, later to be followed by reissuance of passenger tariffs in Ohio; and after the reissuance of these tariffs, the interstate passenger tariffs will be reissued to conform to recent rate raises which have been general all over the country. It is planned to reissue the Central Electric Railway equipment register early in 1921. Joint local storage tariffs will shortly be reissued also.

Ten Cents in Vancouver.—The Washington Public Service Commission has authorized the North Coast Power Company, Vancouver, to put into effect a 10-cent fare on its Vancouver city lines with commutation books of eleven tickets for \$1. The fare has been 7 cents. In promulgating the order the commission took occasion to review the general situation with respect to street railway companies, pointing out that companies everywhere are in a bad way financially, "due principally to the competition of automobiles, both private and for hire, and the only method by

which the companies can secure a sufficient return to justify their continued existence is through increased fares."

Delays Final Action on Parking.—The new traffic ordinance for Chicago, Ill., in which it was proposed wholly to prohibit all parking of vehicles on any of the streets in the "Loop" district between the hours of 7 a.m. and 6:30 p.m., has been tabled. The bill was recently passed by the City Council. Later Mayor Thompson referred it back to the Council and asked for its reconsideration. The Council referred it back to the committee on local transportation, where it originated. This is considered to have virtually killed the bill. Pending final settlement of the parking problem the present ordinance which limits parking to a 30-minute period will be enforced by the chief of police. At the end of the month he will report to the committee on the advisability of re-passing the proposed no-parking ordinance.

Service Restored Pending Fare Decision.—Normal street car service has been re-established in the cities of Syracuse and Utica by the New York State Railways. Mayor Harry H. Farmer of Syracuse and Mayor James K. O'Connor of Utica made application to the Public Service Commission, Second District, for a restoration of service, which was granted in each case. The company resumed old schedules and took back all of the men recently relieved from duty, pending action by the commission on the application for a 10-cent fare in both Syracuse and Utica. The company is charging 6 cents in both cities. It claims this rate to be inadequate. The service was curtailed because of the refusal of the municipalities to allow the railway to increase the rate. The Common Council of Syracuse recently rejected a plan for the drafting of a service-at-cost ordinance for the Syracuse lines.

Eight Cents in Auburn.—The Public Service Commission, Second District, has authorized the Auburn & Syracuse Electric Railroad, Auburn, N. Y., to charge until Dec. 31, 1921, an 8-cent fare in Auburn, a 10-cent fare between Auburn and the Soule Cemetery, and between Auburn and the South Street on its Owasco Lake line, with transfer privileges; and outside of the city limits on the Soule Cemetery, South Street or Owasco Lake lines, 5 cents. The increase asked for was based chiefly on increased wages. Employees demanded an increase last spring. A four days' strike followed. An arbitration award gave a 15-cent an hour increase to conductors and motormen, and increases ranging from 18 to 23 per cent to other employees, thereby adding about \$90,000 to the operating expenses of the company and \$60,000 to the operating expenses of the city system. The Auburn city authorities waived a franchise restriction until Dec. 21, 1921.

Passing Stalled Car Legal.—The ordinance of the city of Raleigh, N. C., regulating traffic passing stationary street cars does not affect a car stand-

ing still in the middle of the block or at places other than those designated for the receiving or discharging of passengers, according to a recent ruling of Municipal Judge Harris. Judge Harris held that an automobile or any other vehicle may pass a stationary car in the middle of a block without an infraction of the law. The ruling came in the midst of the trial of a motorist charged with reckless and careless driving in colliding with a motorman. The evidence showed that the street car was stationary in the middle of a block just behind a work car. The defendant drove his machine to a point opposite the electric car and struck the motorman shortly before his automobile stopped. The defendant contended that the motorman stepped in the way and that the accident was due to the motorman's carelessness.

Seven-Cent Fare Approved.—Judge J. C. Hutcheson of the United States District Court for the Southern District of Texas has approved the report and findings of the master in chancery in the case of the Galveston (Texas) Electric Company versus the city of Galveston, in which the traction company sought authority to increase its fare from 5 cents to 7 cents. The company contended the 5-cent rate was confiscatory. Judge Henry J. Dannenbaum was appointed special master and held hearings and conducted thorough investigations in Galveston to determine the property valuation, rate of return, fair depreciation, maintenance costs and other factors to be considered in fixing a fair rate of return. The master in his report recommended the granting of a 7-cent fare for the Galveston lines. The court has enjoined the city authorities from interfering with the collection of the higher rate. The company will shortly begin negotiations with the city looking to the drawing up of a new franchise.

Dairymen Want System Improved.—Every electric and steam railroad in the state of Ohio is a defendant in the complaint brought by the Ohio Dairy Products Association before the Public Utilities Commission on Dec. 16. The association asks that the roads be compelled to adopt a uniform receipt or waybill system in the transportation of milk cans. The particular item of complaint has to do with the "ticket system" in use by the roads for identifying the cans. It is declared that the stubs of the tickets on the empty cans to be returned are frequently lost or washed off, resulting in loss of the can. In many other instances it is complained, all tickets on a shipment are tied to a single can, causing confusion, so that no record can be kept or had of any shipment. In consequence no proof of claim can be made showing either delivery to the carrier by the shipper or failure to receive shipment by the consignee. It is asked that the carriers issue a uniform receipt or waybill which will enable identification of cans and sureness of shipment and distribution.

Personal Mention

Resumes Law Practice

O. B. Willcox Will Have Office in New York—Resigns from Bonbright & Company

O. B. Willcox retires as vice-president of Bonbright & Company, Inc., New York, N. Y., on Jan. 1 to resume the general practice of law, in which he was previously engaged. He will have offices in connection with Messrs. Choate, Larocque & Mitchell, at 40 Wall Street, New York. It is understood, however, that Mr. Willcox will still represent Bonbright & Company in many matters.

Mr. Willcox has been closely identified with the electric railway industry in many ways during the past few years, not only through his connection as director of a number of utility, industrial and financial companies, but also as a member and a vice-chairman of the Committee of One Hundred of the American Electric Railway Association since the organization of that committee in June, 1919.

He is also a member of the board of governors of the Investment Bankers Association of America and for several years past has been the chairman of its committee on public service securities. In these capacities and through his reports, addresses and articles in the financial and technical papers on public utility topics, he has done a great deal to develop a proper understanding of the function of the regulation of utilities and in bringing about co-operation between investment bankers, public utilities and regulating officials.

Mr. Willcox is a graduate of the law department of the University of Michigan and practiced law in Detroit and later in Colorado with notable success. He came to New York about ten years ago, and since that time has been an active executive of Bonbright & Company, Inc.

Promotion for Mr. Krombach

Harry J. Krombach, who has been foreman of the electrical repair department of the Third Avenue Railway, New York City, for the past twelve years, has been advanced to the position of general foreman of shops for that company.

Mr. Krombach began his railroad experience in 1896 with the Nassau Electric Railroad, a subsidiary of the Brooklyn Rapid Transit Company, and worked in the shops of that company until 1900. He then entered the employ of the Boston Elevated Railway at the time it was equipping its first cars for electric train operation. In 1902 Mr. Krombach began service with the Manhattan Elevated Railroad, New York. Two years later he joined the Jersey

Central Traction Company, Keyport, N. J. After serving with that road in various capacities for four years, he became connected with the Third Avenue Railway. For several years he has been in charge of all electrical repair work.

"Johnny" Livers Again

This Time Mr. Livers Becomes President of the Charlottesville & Albemarle Railway

John L. Livers, who has been vice-president and general manager of the Charlottesville & Albemarle Railway, Charlottesville, Va., since 1912, has been elected president of the company to succeed Norman James, who has resigned to become chairman of the board of directors. Henry L. Duer has



"JOHNNY" LIVERS

been made vice-president of the company. Custis L. Carter, general superintendent, has been promoted to general manager, while Kirby Snider, manager of the new business department, has been made general superintendent.

Patrons of the Charlottesville line as well as the stockholders of the company agree that Mr. Livers' promotion has been well earned. Charlottesville, from the portliest "Colonel" to the tiniest picaninny, welcomes the opportunity to congratulate him. For the past eight years it has been congratulating itself on Mr. Livers' presence in its midst.

"Johnny" Livers has put Charlottesville, a city of 7,000 souls, on the map by giving it a real railway. Just how "real" this railway is from the viewpoint of the car riders may be judged from the fact that it operates the year 'round at a five-minute headway and a nickel fare. As for the stockholders, their opinion of their "G. M." is not hard to guess when one is told that during the past year the railway has

paid dividends of 7 per cent on its preferred and of 3 per cent on its common stock, besides setting aside a considerable amount for depreciation reserve and surplus.

"Johnny" Livers was born in Gettysburg, Pa., in 1878. Starting as a line-man at the age of eighteen he worked for several years in various phases of construction work. He then entered the operating and contracting field, and during a period of twelve years constructed more than 100 electric light and power plants. In 1912 he took charge of the Charlottesville property. An account of Mr. Livers' operating methods was published in the issue of Sept. 22, 1917, page 485.

Changes in Interurban Personnel

Harry E. Pence, president of the Pence Automobile Company, has been elected president of the Minneapolis, Northfield & Southern Railway, Minneapolis, Minn. Former President J. H. Ellison is chairman of the board. W. R. Stephens, formerly of the "Omaha" road and of late sales manager for the Pence Company, is assistant to the president. Mr. Pence is president of the Minneapolis Automobile Trade Association, is a director in the Lincoln National Bank, is member of a company erecting office buildings, and is a progressive citizen generally.

New equipment has been bought for the Minneapolis, Northfield & Southern Railway and eventually the line will be electrified. It is now gaso-electric and has steam engines for switch work.

H. R. Skirving in New York

H. R. Skirving has been appointed auditor of the Eighth Avenue Railroad, New York City. Mr. Skirving served as auditor of the London & Lake Erie Railway, London, Ont., from 1906 to 1912. He then joined the Otsego & Herkimer Railroad, Cooperstown, N. Y., as auditor. The Otsego & Herkimer Railroad changed its name in 1916 to the Southern New York Power & Railway Corporation, and in the following year acquired the Southern New York Power Company, a merger of several small lighting properties in that section of the State. Mr. Skirving served as treasurer of both companies until Dec. 15 last.

G. T. Seely, President

Garrett T. Seely, vice-president and general manager of the Pennsylvania-Ohio Electric Company, has been elected president of The Youngstown Municipal Railway, a subsidiary of the Pennsylvania-Ohio Electric Company, which operates the city railway lines of Youngstown, Ohio, under a service-at-cost arrangement. Mr. Seely succeeds as president of the Youngstown company R. P. Stevens, who resigned as president to be able to devote more time to his duties as president of the Pennsylvania-Ohio Electric Company and associate companies. Mr. Stevens remains a director of the Youngstown Municipal Railway.

Promotions on Public Service Railway

H. H. George Appointed Engineer Maintenance of Way—H. W. Coddling Made Distribution Engineer—Others Step Up

A number of promotions of interest have recently taken place in the engineering department of the Public Service Railway of New Jersey. Under the new plan Howard H. George, assistant engineer, becomes engineer maintenance of way. Martin White continues as superintendent maintenance of way. H. W. Coddling, engineer of the distribution department, is advanced to distribution engineer. George H. Haldeman is promoted to assistant engineer maintenance of way, while Nelson A. Baldwin is made special work engineer. Morris J. Baller becomes estimating engineer, while Leslie B. Woodruff is appointed construction engineer. B. W. Pierson, formerly secretary to Richard E. Danforth, vice-president and general manager, is made executive assistant to Mr. Danforth. Alfred H. Nelson is promoted to chief clerk in the engineering department.

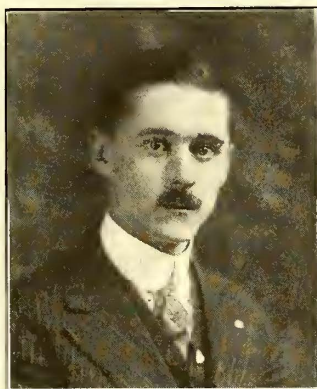
HOWARD H. GEORGE, appointed engineer maintenance of way, is a graduate in civil engineering of the University of Pennsylvania, class of 1907. He began his practical experience early in the summer of 1906 as resident engineer in charge of the construction of a suburban railway extension for the Public Service Corporation, and remained in charge of that work during his last year at college. Upon the completion of the project in 1907, he was transferred to headquarters at Newark, where he served as a field engineer until 1909. At that time he was appointed division engineer of the Southern Division of the company's property, taking in all the lines radiating from Camden. In 1911 he was promoted to the position of assistant engineer and again transferred to Newark. He served in this capacity until May, 1917, during which time he was in charge of estimating and engineering cost accounting work, and also had supervision over bridge design and erection.

As an officer of the Engineer Officers' Reserve Corps, Mr. George, then a first lieutenant, was called to active duty on May 8, 1917. After three months in training camps at Fort Meyer and elsewhere he was promoted to the rank of captain and assigned to the 305th Engineers, 80th Division. He served with this unit in command of Company E until April, 1918, when he was transferred to the 55th Engineers, a broad gage railroad construction regiment. In the latter unit he commanded Company A, serving with that outfit in France until the end of November, 1918. During part of this time he was in charge of building construction on the Chateaux Storage Depot project. Shortly after the signing of the Armistice he was transferred to Le Havre on special duty with the Base Section Engineers and made engineer in charge of railroad construction. The signing of the Armistice having halted all construction work in the A. E. F., Captain George was among the first officers returned to the States. He landed in Hoboken the latter part of January, 1919, at which time, at his own request, he was honorably discharged from the military service.

He returned to his former position as assistant engineer with the Public Serv-

ice Railway in February, 1919, continuing in that capacity until his recent appointment as engineer maintenance of way. He is a member of the American Society of Civil Engineers, and is also a new member of the Committee on Way Matters of the American Electric Railway Engineering Association. Mr. George is known to many members of the industry through his frequent contributions to the *ELECTRIC RAILWAY JOURNAL*.

H. W. Coddling is a graduate of the



H. H. GEORGE

electrical engineering department of the Massachusetts Institute of Technology, class of 1912. He entered the employ of the Public Service Railway in July, 1912, as a cadet engineer. He served in the mechanical, transportation, track and distribution departments of the railway and in the production department of the Public Service Electric Company, and was finally promoted to engineer in the distribution department of the railway, where he served until December, 1917. From December, 1917, to January, 1919, he was employed as assistant to the chief electrical engineer of the New York Edison Company, returning to Public Service Railway on the latter date as engineer in the distribution department. By his recent promotion Mr. Coddling becomes distribution engineer.

George H. Haldeman, appointed assistant engineer maintenance of way, is a graduate of the Newark Technical

School, class of 1904. He has been employed in various capacities in the engineering department of the railway since 1903. He has held the position of office engineer from 1908 until the time of his appointment to his present position. Prior to his connection with the Public Service Railway he was employed on municipal and city survey work by a firm of surveyors in the city of Newark, and also worked on special track layout with the New York Switch & Crossing Company, with headquarters in the city of Hoboken, N. J.

Nelson A. Baldwin, promoted to special work engineer, was graduated from Barringer High School, Newark, N. J., in 1909. Before joining Public Service Railway he was employed with a Newark firm of surveyors, and at the same time attended classes in the Newark Technical School. Later he completed a course in surveying at Columbia University. His connection with the Public Service Railway dates from September, 1912. During the past eight years he has served as draftsman and as engineer on design of special work.

Morris J. Baller, who is made estimating engineer, is a graduate of the civil engineering department of New York University, class of 1909. Following his graduation he was employed by Terry & Trench on miscellaneous design work. In 1910 he entered the service of Juragua Iron & Steel Company, a subsidiary of the Bethlehem Steel Company, at Juragua, Cuba, where he was employed as assistant engineer on preliminary surveys for a proposed railroad. He joined the Public Service Railway in November, 1910, and has served successively as draftsman, instrument-man and engineer with the Public Service.

In the past two or three years Mr. Baller has been in charge of the preparation of detailed cost report analyses and in the compilation of detailed estimates of track construction and reconstruction work of all kinds. During a portion of the time covered by the war period he served with the United States Bureau of Standards at Washington, where he was assigned to draw up for the Government reports on various phases of electric railway transportation.

Leslie B. Woodruff, promoted to construction engineer, was a student in mechanical engineering at the University of Wisconsin, class of 1903. During the summer months from 1896-1903, he served as foreman of construction with the United States Light House Service on the Great Lakes. He entered the employ of the Public Service Corporation in December, 1903, as a student, spending most of his time in the shops. Two years later he became associated with the engineering department as an inspector on building construction. In April, 1910, he was appointed division engineer, which position he held up to the time of his appointment as construction engineer. He is an associate member of the American Society of Civil Engineers.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER.

SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

Year's Buying Has Not Been Heavy

Traction Interests Have Been Purchasing Only for Immediate Necessities in Most Cases, but Outlook for 1921 Is Much Better—Stocks Generally Plentiful

The year just passed has been a hard one for the traction purchasing agent. On his side of it he has been hampered by a shortage of funds which has required that he purchase only at the last minute, in the long run of cases, and then only for his immediate needs.

On the other side the manufacturer of traction supplies has been hampered by production conditions that have virtually been unprecedented in extent. High prices, low supplies of coal and raw materials, freight handlers' strikes, freight tie-ups and congestion, car shortage, labor shortage and inefficiency—all these coupled with a phenomenal demand on the part of the electrical industry as a whole over the first half of the year made it very difficult to supply traction companies on short notice with many items of their needs. At the same time there were of course many items of electric railway maintenance on which quick deliveries could be secured because buying was not very heavy and was in small amounts, and also because certain small stocks were available.

With heavy price reductions in textile, leather and some few other lines there has been anticipation from some quarters of a price reduction in supplies for traction companies. In general these reductions have appeared only in instances where articles are made for the most part from cotton, iron and copper and show relatively little labor cost.

Few extensions have been made in the past year, but during that time many companies have been granted fare increases which should permit them to make these much-needed extensions in the near future. The traction interests are behind in their new work and frequently so in their maintenance and repairs, so it would seem that the coming year should see a great deal of buying.

Short Supply of Track Material Greater Part of Year

During the first three-quarters of the year deliveries on track supplies such as spikes, bolts and nuts steadily lengthened under a steady pressure of demand. Foreign competitive buying aided in piling up a large volume of unfilled orders, especially on bolts. By the first of September, when the scarcity had about reached its height, de-

liveries of standard railroad spikes averaged two to three months and track bolts three to four months. From then on the situation eased up under slackening demand and canceled orders, until by the end of the year shipments were being made almost from stock in some cases and as long as six weeks on bolts and four weeks on spikes in others. Prices followed an upward trend as a result of high fuel, labor and material costs, but have gradually declined in the last quarter. Prospects for consumption of track material in large quantities by railroads next spring are held to be excellent.

Normal Orders for Brake Shoes

Orders for brake shoes from electric railways were held close to actual requirements and the expected increase in buying from steam railroads following their rate increases did not materialize in the volume that was anticipated. Nevertheless, buying on the whole during the year was about normal. Raw material stocks were reduced to lower levels than usual as shipments of coal, coke and pig iron were slow and irregular for a considerable period. Customers' needs were well taken care of, however, as deliveries of standard shoes for the most part were made from stock. The standardization movement, reducing the number of patterns carried virtually to four styles, aided in this. Orders on behalf of new rolling stock were a negligible factor in the demand.

Demand for Wood Ties Not Up to Standard

Consumption of railroad ties does not seem to have been up to the standard of other years as buying for the most part has been for replacements only. Steam railroads did not enter the market as heavily as was expected the last four months of the year. Stocks of ties at the camps were maintained at good levels, but car shortages for long periods curtailed the supply and made shipments uncertain. An influx of Douglas fir ties is noted in the East and Middle West to supplant oak ties cut along the right of way, as the latter were rather high in cost and uncertain in supply. One factor which served to curtail the supply of ties was the higher prices which timber owners obtained for trees cut into

board lumber, while another was a shortage of labor at certain times due to higher wages paid workmen for cutting this same board lumber. Prospects for good demand in 1921 are thought to be excellent as the normal consumption of ties necessary to keep roadbeds in good repair, according to the United States Forest Service, is 100,000,000 to 125,000,000 annually. For the past several years buying has fallen considerably below this figure owing to financial conditions.

Demand for Railway Motors Slackens in Last Half

Sales of railway motors were very gratifying during the first half of 1920, the bulk of the demand, of course, being for motors of the safety-car type in about the proportion of three to one. During the last six months, however, quietness has been the prevailing feature of the market. Inability to obtain control equipment and a shortage of gears, insulating material and various small parts were the chief factors impeding deliveries, which ranged around three to four months for moderate orders of safety-car motors and six to eight months for large types early in the year. These figures gradually improved under the slackening market to about forty-five to sixty days for the safety-car motors and a month longer for heavier types. Raw material, while much easier as to supply, has remained high in price and consequently prices have not changed since a slight increase by manufacturers of safety-car equipment last February.

Waste Supply Curtailed by Textile Mill Shutdowns

Good demand and the curtailed production of textile mills were responsible for short supplies of cotton and wool waste over a large part of the year. Many New England mills cut production to four and even three days per week and some even closed down entirely. This naturally reduced the supply of waste, which is a by-product of textile mills, so that stocks were very low over a long period.

The price trend of waste was still upward the middle of the year, when advances of 2 cents per pound on cotton and 1 cent on wool waste brought the price to 9 to 16 cents for cotton colored, 12½ to 18 cents for cotton white and 16 to 25 cents for wool waste. Prospects of a shortage were removed, however, when demand dropped to almost nothing the latter part of the year. At the same time price decreases were made in view of the lower raw

material cost, spot cotton being quoted at 14½ cents now in New York. Quotations recently were 7½ to 12 cents per pound for cotton waste colored and 10½ to 14 cents for white in 100-lb. bales.

Slump in Strong Demand for Trolley and Bell Cord

Demand for trolley and bell cord in 1920 compares very favorably with other years as until comparatively recently the supply of this material was not as large as the demand. A distinct tendency has been noted to replace leather material with braided cotton bell cord. Demand for sash cord from the building trade the early part of the year was partly responsible for prevailing low stocks until the first of November. Deliveries during this period ranged in the neighborhood of one to two months.

The supply of cotton at no time occasioned any great trouble except as shipments were delayed by freight tie-ups. Prices advanced somewhat in the spring, at which time quotations ranged from \$.97 to \$1.10 per pound according to grade and manufacturer. Following the lower cost of raw cotton, however, quoted now at 14.50 cents New York, trolley and bell cord prices have fallen to a range of 66 to 85 cents per pound. Demand at present is light in character and the supply plentiful for all needs.

Malleable Castings Now Available

The supply of malleable castings has been one of the plague spots in the production of electric railway supplies through a great part of the past year. Foundries which some of the time were forced to operate at as low a capacity as 50 per cent, due to labor shortage, were utterly unable to supply the demand and had to refuse many orders. Prevailing long deliveries in many items in the supply branch of the electric railway industry can be traced largely to this circumstance. Manufacturers were very often forced to use substitutes perhaps higher in price or less efficient. The shortage of coal was another factor in bringing about the extreme long delivery of eight months on heavy castings and ten weeks on light malleable castings. The latter half of the year, as labor became more plentiful and transportation eased up and permitted supplies of coal and raw material to come through, the situation grew better. Deliveries have been steadily improving, but are still far from all that is desired. Prices have remained steady.

Good Volume of Business for Fare Boxes and Registers

The growing use of metal tokens and an increasing tendency to count fares instead of passengers on street car lines resulted in excellent sales of fare boxes, demand being well ahead of 1919 in this respect. Buying of fare registers was also good, but does not pre-

sent such a uniform increase over a year ago, for some manufacturers report the biggest year of any in sales, while others have met only an average normal demand. Raw material difficulties were experienced by producers, especially in obtaining steel and malleable castings. Fare registers were in better shape as to shipment, as a level of three months' stock was maintained on standard types, though delivery of some ranged as long as four months. Fare boxes, however, could not be shipped from stock, as by mid-summer back orders for a period of three months had piled up. Prices have been fairly stable, with some slight increases being made about the middle of the year by some companies that had not taken this step to meet rising material costs in 1919.

Pole and Hardware Sales Good

For the first nine months of the year railways at a distance from lumber regions had trouble getting wood poles and crossarms. Pins were a little easier. Demand was dropping off by midsummer, but even then shipments were by no means certain. They had been virtually impossible from the mills, where stocks were in good shape. But jobbers' stocks were low because of car shortage. In the woods labor was short in the winter and spring, and weather conditions and transportation were such as to hamper seriously the delivery of poles. Production during the present winter is expected to be better than that of last year.

Car movement improved in the late summer and fall and poles and arms are moving in good shape now from pretty good stocks. Buying has been good for maintenance purposes, and this condition should continue because of the general policy of keeping purchases down to present needs.

For steel towers the foreign demand has kept up, while domestic has been light. Shipments run from about four to seven months.

Line hardware buying opened up well in the spring and continued at a good rate right through the year, mostly, however, for near-by demands only. While stocks started in good condition, they soon petered out when strikes in the steel mills and car shortage cut down production in May and June. These stocks were still short when winter set in.

High-Tension Porcelain Hard to Get

Shipments of high-tension insulators, bushings, etc., are still ruling long, from three to eight months being quoted, depending on type and voltage. This has been probably the hardest bit of supply material for electric railways to lay hands on for the whole year. Demand for domestic uses has in general been good all year and when it has dropped off the foreign demand has held up well. All this has had its effect upon the production of high-tension porcelain for traction use. There

has not been so much buying for new extensions but rather for maintenance work.

Early in the year production was off as much as 40 per cent in some instances because of the inability to get labor for the kilns, its inefficiency and its independence. Unsatisfactory production resulted and prices went up. Also malleables were short. These conditions have since been rectified to an extent, but shipments have not shortened very much.

Steam Coal Prices Decline

Supply Greater Than Demand with Many Industries Shut Down—Speculation Is Past

"The coal market is saturated," declared an official of one of the large Middle Western coal sales companies last week. The poorer grades of steam coal have dropped from \$2 to 83 cents a ton in the Central West, while the better grades that have sold at from \$7 to \$8 are now going begging at from \$3.50 to \$4. In some cases coal that sold at from \$8 to \$10 a few months ago is now going at \$3 per ton.

"There is a greater supply than demand," said George W. Reed, vice-president of the Peabody Coal Company, in a public statement last week. "Industries have shut down all over the country. They have no further use for fuel. Conditions are beginning to readjust themselves. I would say that the drop in the price of coal is simply an indication of business getting down to normal competitive prices."

The indications in the entire Middle Western territory are that the wild speculation of the last few months is past and that the coal industry is settling down on a normal basis with no danger of shortage except in a few spots where transportation may be hindered if severe winter weather should develop suddenly.

100 More Cars for N. Y. Municipal Railway

The New York (N. Y.) Municipal Railway, through an order signed the first part of this week, is authorized by the Public Service Commission to purchase 100 additional steel subway cars for use on the Municipal Railway lines. The order will go to the Pressed Steel Car Company at a price said to be \$36,410 each. The cars are a duplicate in construction to the previous order of 100 cars placed with the Pressed Steel Car Company last May. These were equipped with Westinghouse type A. M. U. E. air brakes, Westinghouse type A. B. F. control and General Electric type 248-A motors. Seating capacity is about ninety persons. It is expected that the new cars will be ready for delivery in 18 months. This latest order makes the ninth lot of 100 cars of this type that have been ordered by the company. About 600 of these had been delivered up to Oct. 1 last, on which date the first of the seventh lot of 100 cars were to be delivered.

Rolling Stock

The London (England) County Council has contracted for 125 new tramcars. There were separate bids by British manufacturers for the bodies, trucks, electrical equipment and magnetic brakes, which bring the total cost to approximately £4,300 per car, or at present exchange rates about \$15,050. This is said to set a record price for cars of this type in England. In 1910 the cost of a similar car was £880. The cars will be of the eight-wheel bogie type, double decked, with roof seats enclosed, and a total seating capacity of about eighty people. Delivery is to begin in forty-two weeks from the date of order.

United Railways Company of St. Louis, Mo., through Colonel A. T. Perkins, manager under the receiver, will request permission from Judge Lamm to buy fifty more cars of the large 777 type in the near future. Fifty cars of this type are being made in the company's shop, three are in operation and sixteen more will be completed about Jan. 1. It is expected that all will be in operation by March 1.

Power Houses, Shops and Buildings

Pacific Electric Railway, Los Angeles, Cal.—Construction on the new Pacific Electric depot at Wilmington is under way. The structure will cover a space 24 ft. x 60 ft. It will consist of two waiting rooms, ticket office and express room.

Union Traction Company, Nashville, Tenn.—The City Council of Gallatin is negotiating with the Union Traction Company, Nashville, for furnishing power to the city of Gallatin, Tenn., for lighting and motive power. The contracts will call for erecting a line from Nashville to Gallatin over the right-of-way of the Union Traction Company, operating an interurban railway between the two cities. A substation will be erected between the two cities. The present power plant of the city of Gallatin is inadequate to meet the growing demands for lighting, but will be retained for use in emergencies.

Track and Roadway

Interborough Rapid Transit Company, New York, N. Y.—Construction of the Queensboro subway will be started within the next few months and according to the transit commissioner the work will be rushed to completion. This extension will be an improvement over the shuttle system in operation between Grand Central and Times Square. Under the proposed new scheme passengers from Queens en route north and south on the west side will remain on the trains to Seventh Avenue and Times Square.

Seattle (Wash.) Municipal Railway.—D. W. Henderson, superintendent of the Seattle Municipal Railway, has recommended to Mayor Hugh M. Caldwell and the City Council the undertaking in 1921 of ten municipal railway extensions and betterments, estimated to cost between \$543,713 and \$583,853. The proposed improvements affect Ballard, the Green Lake and University districts, First Hill, Rainier Valley, Georgetown and the waterfront district toward Georgetown. Mr. Henderson states that all the improvements are absolutely necessary. He urges that the necessary steps be taken to issue bonds to secure money for the extensions. In addition, the sum of \$20,000 will be required to purchase feed wire.

Toronto, Ont.—The recommendations of the Board of Control that the Transportation Commission be empowered to expend \$500,000 on additional car lines in Ward 7 was referred back by the City Council.

Toronto, Ont.—Mayor Church proposed to the City Council that the Board of Control report on a by-law to provide street railway accommodation for West Toronto.

Hydro-Electric Power Commission, Ottawa, Ont.—Surveys are being made by the engineers of the Hydro-Electric Power Commission with a view to constructing an extension of the railway lines along Ottawa Street, Erie Street and Parent Avenue, Windsor. Application will be made to the Ontario Legislature at its next session for permission to issue \$1,000,000 of bonds for this purpose.

Trade Notes

The Worthington Pump & Machinery Corporation, 115 Broadway, New York City, is receiving bids for the erection of a one-story, 50 ft. x 75 ft. addition to its plant at St. Bernard, Ohio.

The Absolute Con-tac-tor Company, Chicago, has moved its factory from 2003-2005 Larrabee Street to larger quarters at 4056-4058 Armitage Avenue. The offices of the company remain at 127 North Dearborn Street.

The Lincoln Revolving Transformer Company, Cleveland, Ohio, recently organized by J. C. Lincoln, president of the Lincoln Electric Company, to manufacture a revolving type of transformer developed by Mr. Lincoln, has established a plant at 2400 Woodland Avenue.

British Export Register Out.—The export register of the Federation of British Industries has been published by that federation, 39 St. James Street, London, S. W. Among the 650 pages are given the federation's constitution, aims, etc., list of members with their manufactures classified, and advertisements.

The O. M. Edwards Company, Inc., Syracuse, N. Y., manufacturer of window fixtures, platform trap doors, etc.,

announces the appointment of C. A. Eggert, who for a number of years was connected with the sales department of the Consolidated Car Heating Company, as sales manager for the central district, with offices at 1425 Edison Building, Chicago, Ill.

The C. & G. Cooper Company, Mount Vernon, Ohio, engine builder, has made a number of changes in its organization during the year. At the regular meeting held in June the following officers were elected: B. B. Williams, president and general manager; F. H. Thomas, vice-president in charge of sales; Mr. Taylor, secretary in charge of production, and W. L. Daney, treasurer. The company reports an increasing volume of business.

The Chase-Shawmut Company, Newburyport, Mass., announces the appointment of H. C. Moran, Keystone Building, Pittsburgh, Pa., as district representative for the following territory: Western Pennsylvania, Ohio, Kentucky and West Virginia. The Engineering Equipment Company, 1011 Chestnut Street, Philadelphia, Pa., has also been appointed district representative for eastern Pennsylvania, New Jersey and Maryland.

Charles Lyman Rand, secretary and chief chemist of the Mitchell-Rand Manufacturing Company, New York, manufacturer of electrical insulation, has relinquished his duties as factory superintendent to devote his entire time to important research work in the chemical and allied fields for his company. He will be succeeded as factory superintendent by Joseph T. Lawrence, chemical engineer, formerly associated with E. I. du Pont de Nemours & Company.

New Advertising Literature

Oilers.—The Eagle Manufacturing Company, Wellsburg, W. Va., has issued catalog No. 20, covering its different types of oilers.

Electrical Instruments.—The Burton-Rogers Company, 755 Boylston Street, Boston, Mass., sales department for the Hoyt electrical instruments, has issued a catalog of Hoyt electrical instruments, including dashboard, miniature switchboard, large switchboard and portable instruments.

Small Turbo-Generator Sets.—The General Electric Company, Schenectady, N. Y., has published bulletin No. 42-010A, which supersedes bulletin No. 42,010, describing and illustrating the small Curtis steam-turbine generating sets. These generating sets have a capacity of 100 kw. to 300 kw. and are mounted on a common base with turbine and gearing.

Power Plant Specialties.—The Plant Engineering & Equipment Company, 192 Broadway, New York City, has issued a twenty-page catalog covering its "Peeco" specialties, including steam traps, separators, strainers, regulating devices, blowers, meters, etc.