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THE FUTURE OF THE RAILROADS IN THE AMERICAN ECONOMY

16 February 1949

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THE FUTURE OF THE RAILROADS IN THE AMERICAN ECONOMY

16 February 1949

DR. ASHTON: In the transportation phase of our course so far we have been giving consideration to problems of coordinating the operations of the individual transport agencies, with a view to providing a unified transportation system. The dominant position of the railroads in the movement of wartime traffic has been an important fact with which we have been dealing in this connection. We are now in a position to look into the future and try to see where our present policies may be leading and what part the railroads may be destined to play in the developments that lie ahead.

We are particularly fortunate in this circumstance in having as our speaker this morning a man who has devoted practically his entire life to the railroad industry. In a recent editorial commemorating the hundredth anniversary of the founding of his railroad the statement was made that he has been "one of the most accomplished, progressive, and courageous administrators and business statesmen who have ever devoted their talents to railroading."

In addition to his position as president of one of the leading railroad systems of the country, he is also a director in important industrial and banking institutions. Because of his wide experience and broad understanding, he was retained by the Government during the period of our preparation for the past war as Transportation Commissioner to the Council of National Defense.

I am happy to present to you now Mr. Ralph Budd, President of the Chicago, Burlington and Quincy Railroad, who will discuss with us this morning "The Future of the Railroads in the American Economy."

MR. BUDD: Dr. Ashton and gentlemen: I suppose you realize how difficult you make it for one to live up to such a fine introduction. Nevertheless, I want to thank you sincerely for your kind reference.

The "National Transportation Policy" of 1940 outlines certain things to be done and states that these are "all to the end of developing, coordinating, and preserving a national transportation system by water, highway, and rail, as well as other means, adequate to meet the needs of the commerce of the United States, of the Postal Service, and of the national defense." The National Security Act of 1947 created a National Security Resources Board; its function shall be to advise the President concerning the coordination of military, industrial, and civilian mobilization. Thus Congress has given formal recognition to the close relation between military and industrial organization and development.

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From our experience in the recent World War we know that railroads are such universal carriers that they do not need to be "converted" in order to make the shift from transporting for peace to transporting for war. Of course, the commodities to be moved are very different; the length of haul and handling required are different too, but I believe that if we have adequate capacity for all of the peacetime activities of the country, we may feel secure as regards freight transportation in the event that production should be diverted largely to supplying the sinews of war.

It is not so obvious that if the railroads have ample capacity for peacetime travel by rail, they would in case of war, be able to take on all civilian travel, including that incident to war, and, in addition, the movement of troops. This is because in peacetime the vast bulk of travel in America moves by highway and if, as happened in the recent war, rubber and gasoline restrictions should prevent most of that type of movement, railway trains would become greatly overcrowded. Of course, another war might not necessitate the same restrictions in the use of automobiles.

Since 1940, when the National Preparedness Program was first launched, then during the war, and since, the country's mines, farms, and factories have produced at an unprecedented rate, and whether it has been for peace or war, the railroads have handled a larger share of that production than they were handling before the war. Our concern is that nothing shall happen which will prevent the railroads from keeping up with the progress of the country, and gradually improving their properties and services.

Railroads use a physical plant which is the result of evolution extending over more than a hundred years. It consists essentially of fixed property, that is, roadway and structures, and of the locomotives and cars which move over the tracks. Railroads differ from most industries in two important respects: First, the railroad plant represents an enormous net investment, substantially over 20 billion dollars; and, secondly, even aside from the impracticability of financing such an undertaking, the tremendous amount of labor represented, and the huge quantities of materials and supplies of all kinds embodied in the plant make it out of the question to have any immediate or exceedingly rapid revision and reconstruction of the physical properties. There would be no economic justification, and the country could not afford, to scrap billions of dollars of property which is usefully employed and affords the best transportation service thus far developed, simply because somewhat better results could be achieved if, by magic, an entirely new plant could be substituted which would embrace all the most recent developments of science and industry.

Another and closely related circumstance is the fact that, while the volume of freight and passenger business handled by the railroads fluctuates widely over a period of years, it is physically impossible to adjust the size of the railroad plant to these fluctuations. Unlike most industries, the entire existing property must continue to be operated, even though traffic may greatly diminish. Train service can be somewhat reduced, in a period of depression, but some train service must be maintained over all lines which are not to be abandoned. The fact that the extent of the railroad plant is rather rigid and unyielding almost inevitably subjects the railroads to criticism for delays in furnishing cars and for inconveniences in times of peak traffic, and, conversely, to complaints during periods of depression that the railroads are overbuilt.

Due to the physical limitations just outlined, the only feasible method of providing adequate and efficient transportation and of adapting the railroad plant to the growing and changing needs of the country is to do so gradually but continuously. It is improvident, if not impossible, to let the plant deteriorate for some years and then try quickly to place it in condition to meet some great emergency. From the military standpoint, it would be disastrous. Not only would it take some time to build up the railroads if they were permitted to deteriorate, but, in the event of war, the necessity for handling great volumes of freight and passenger traffic would coincide with pressing demands for steel, lumber, and other materials for the war effort.

The terrific physical strain upon the railroads during the last seven years, when it was so difficult to secure labor and materials necessary to overcome the wear and tear upon them, has resulted in deferred maintenance estimated by the Interstate Commerce Commission's Bureau of Valuation as of 31 December 1948, at 560 million dollars in the track accounts (ties, rail, track material, and ballast). This does not mean that the railroads are in danger of breaking down, or that operation is unsafe, but unless the condition is corrected a war would find the railroad plant less able to make a long-sustained maximum effort than it should be.

To make this clear, the railroad is made up of literally millions of separate items brought together in such manner as to function as a transportation machine. The durability of the various articles embodied in the plant varies considerably. Steel and masonry bridges have a long-life span. Trestles and similar structures last for a number of years, depending to a considerable extent upon whether they are of timber or of concrete, stone, and steel. Track rails ordinarily last for many years, although quite generally they are not used in the same place throughout their lives, but may start their service on a main line and later be relaid on some siding or secondary or branch line. The life of railroad ties is extended far beyond what was experienced some years ago, due

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chiefly to three things: first, increasingly effective treatment with wood preservatives, aided by pre-adzing and boring the ties; secondly, use of adequate tie plates to protect against wear; and thirdly, strengthening the other elements of the track by better drainage, ballast, rail, and fastenings.

One of the great forward steps is the mechanization of track upkeep. On main lines, maintenance of the roadbed and track is done mechanically to a large extent. Heavy rails are no longer lifted by muscular effort, and ties are not always tamped by hand. The same is true with pulling and driving of spikes and tightening of bolts. Mechanization of railroad maintenance results in better tracks and smoother riding trains.

The railroads have been improved and changed throughout the years, partly as a result of the changing needs of industry and agriculture, and partly because better materials and devices became available. Relatively few of the changes separately considered are spectacular, but there has been a gradual process of betterment which has contributed greatly to dependable, safe and economical operation. There may appear to be little difference between new rails of today and those used 15 or 20 years ago, but the difference exists and is of great significance. Not only are the new rails generally heavier than those they replace, but advances in metallurgy and methods of manufactur have provided us with better and stronger material, of more uniform quality, and less likely to contain hidden flaws; more scientific design of the rails has made it possible, for any given weight of section, to construct a rail which not only will wear better, and protect the ties and roadbed from undue mechanical strain, but will furnish a smoother and safer ride. Of almost equal importance is the fact that angle bars for the new rail sections are so superior to the older ones that the rail joint, always the weakest point in track, has been strengthened relatively more than the rail itself. There is also a trend toward a longer rail, which of course reduces the number of joints.

You may be particularly interested in the better and safer operatio through improvements in signals and communications. One of the more important steps has been increased use of centralized traffic control. Where this system is installed, it materially increases the capacity of a single track to handle traffic. Switches and signals are controlle by the train dispatcher, no stops being necessary to open and close the switches; indeed, even train orders are not necessary since the trains move wholly upon signal indication. Moreover, through the centralizatio of control of trains and the accurate knowledge of the position of all i the control territory, not only facility but safety of operation is enhanced. In 1929 only 341 miles of Centralized Traffic Control had been installed on all steam railroads in the country. Now, such installations cover more than 10,000 miles of road.

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The railroads are engaged in supplementing their telegraph and telephone systems by installing radio communication at terminals and on trains. The value of such equipment in train and switching movement has been conclusively demonstrated within the last few years. The use of radio by railroads has been under consideration and the subject of experimentation for many years, but only in recent years has it been so developed and perfected as to be satisfactory for use in day-to-day operation under actual conditions. The railroads plan to spend about 15 million dollars on radio equipment during the next three years, and there is no doubt that its use will increase unless the Federal Communications Commission should deprive the railroads of some of the radio frequency channels now assigned to them.

Speeding up of trains has brought about new ideas of railroad construction and maintenance. When a great many of the railroad lines were located and built, standards of gradient and curvature were established which were considered suitable at that time. The three-degree curve was commonly used, while the one-degree curve is now regarded as proper for unrestricted speed. For present-day fast-train schedules, the sharper curves must be reduced or eliminated wherever practicable in order to avoid reducing speed and loss of time regaining it. The transition from straight track to circular curve, and vice versa, must be made through long spiral easements. Likewise, changes from one rate of gradient to another must be effected by easy vertical curves. The line revisions of this character involve major operations and large expenditures, but they will provide better transportation for the public and, from the military standpoint, will both increase capacity and reduce time in transit.

Progress is being made in fitting the railroad plant to handle more traffic and do it more rapidly and economically, by increasing the length of passing sidings, and improving the design and operation of freight yards, particularly at large terminals. While not a new development, much greater use is being made of "hump yards," due largely to improvements in the layout of such yards and in the use of "retarders" to control the speed of cars leaving the hump.

The most spectacular change in railroad operation in the last ten years has come with the Diesel locomotive. Until recently the steam locomotive, burning coal or fuel oil, provided nearly all of the motive power for American railroads. In a relatively few locations where it was thought conditions were favorable, electric locomotives operating with power from wayside plants supplied through a third-rail or trolley have been in use for a number of years. Electricity provides the most flexible motive power and the easiest to operate. The Diesel electric locomotive has the flexibility and availability of the electric locomotive, plus the advantage of requiring no trolley, third-rail, or central power plant. The Diesel power plant is carried on the locomotive, and can be shut down when the engine is not in service. Through so-called "dynamic braking,"

the Diesel electric locomotive can slow down a train without the application of brake shoes to the wheels--a very valuable feature of the electric but not possible with the steam, locomotive.

The first Diesel was a switcher installed in 1925. By 1935 there were 113 Diesel units on class I railroads. The number rose from 540 at the beginning of 1940 to about 8,200 Diesel units at present. In the year 1948 the class I railroads put in service 1,487 new locomotives, of which 1,397 were Diesels, many of them multiple units. The overwhelming majority of existing locomotives are still steam, although the number declined from about 41,000 at the beginning of 1940 to 32,613 at present, while there are now 5,640 Diesel locomotives. Number of locomotives is not a reliable measure for comparison, however, because, generally, one new Diesel as coupled in service takes the place of about three steam locomotives. Virtually all new motive power now being built is Diesel, except in the relatively limited electric zones. There are now more than 10.7 million Diesel locomotive horsepower in service on United States railroads. It should be observed that the steam locomotives retained are generally the more powerful ones, as indicated by the fact that in 1923 average tractive effort of steam locomotives was 39,177 pounds, while it is now 55,629 pounds.

It may be appropriate here to correct a popular misconception of the part played by Diesel locomotives in consuming available petroleum products. Computations based on figures for 1947 indicate that if all the work on the American railroads had been done by Diesels, the total fuel required would have approximated 5 percent of the total consumption of petroleum products. I mention this to dispel any idea that increased use of Diesels by the railroads has played or will play a prominent part in causing shortages of petroleum products. I cannot too strongly emphasize the fact that the relative importance of railroad transportation compared with the various other uses that might be made of petroleum products, and the outstanding performance of Diesel locomotives make it essential that Diesel fuel oil be supplied in ample quantities if war should come and there is not enough oil for unrestricted use by all users The good performance of the railroads in World War II would have been impossible without the Diesel locomotives.

From what I have said, it may seem that I am a partisan of the Diesel locomotives. That is true only to the extent that their performance is superior to any other type of power.

Steam locomotives have been improved gradually during this period when they have been supplanted in favor by the Diesels, and experiments are being conducted which may result in turbine locomotives superior to anything we now know. If a new type of steam or gas-turbine locomotive is developed which is as good as, or better than, the Diesel, the public and the railroads will be just that much better off. At the present time, however, Diesel locomotives provide the greatest efficiency, availability, and flexibility of any motive power that is available.

They are economical to maintain and, as a corollary to this, they are out of service for repairs a very small part of the time.

On the whole, the Diesel can maintain high speeds for longer distances than can the steam locomotive, and the turn-around time of the Diesel is much shorter. In making an over-all fast schedule, more is involved than simply attaining a high speed. With the Diesel, fewer service stops are necessary than with the steam engine. Such stops as must be made are of shorter duration. The train is stopped and started more smoothly and speed is attained more quickly with the Diesel.

Improvements in track and in motive power are vital for any constructive railway program, but we also must consider adequate cars of such quality that advantage can be taken of the other improvements. At present many freight cars are quite old, and they slow down the trains in which they are handled. The exigencies of the war years were such that cars which in the ordinary course of events would have been retired and scrapped were continued in service. Such cars were not wholly satisfactory, and maintenance charges were high, but it was difficult to secure labor and materials to build new cars, and the traffic to be hauled was of unprecedented urgency and volume.

At the height of the war effort, in 1944, there were 1,822,407 freight cars in railroad ownership and 270,936 in private car lines, a total of 2,093,343. Now there are about 2,100,000 cars.

The net decline during the past twenty years for all United States railroads was 600,000. To some extent this has been offset by the larger size of the new cars, but there has been a loss of aggregate carrying capacity approximating 15 percent.

Of the 1,839,000 freight carrying cars now owned by class I railroads, about one-third are less than 16 years old, about one-fifth are over 30 years old, and the balance are from 16 to 30 years old.

It is true that many of the old cars have been rebuilt; but it is also true that about 80 percent of the cars have passed through eight years of very hard service. The oldest cars are expensive to maintain and are not suitable for operation in high-speed trains.

It is desirable, as soon as it is feasible to do so, that all freight cars used in interstate commerce be equipped with the latest type air brakes. More than 80 percent owned by class I roads are now so equipped. The latest design of steel truck with steel wheels, tubular axles, and roller bearings is also desirable as soon as available and as rapidly as purchases can be financed.

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During the last 15 years or so, there have been advances in metallurgy and in the use of steel alloys, made up of compositions of iron, chromium, nickel, manganese, silicon, molybdenum, and others, which have greatly increased the strength of the material and thus revolutioni the basis for engineering design as regards the relationship between weight and bulk, on the one hand, and strength on the other. Thus, it is possible to build cars that will weigh less, but carry more freight than cars of ordinary design and material. Some progress has been made along this line, but not enough, partly for the reason that the development occurred during the depression years and the war years and also because, since the war, it has been very difficult to secure cars of any sort, and they have been exceedingly expensive. On account of the number of over-age freight cars, and the transportation needs of the country, the railroads should put in service 100,000 or more freight cars each year for several years to come. During 1948 the number installed by class I railroads and railroad-owned and controlled refrigerator car companies was 102,737, while they retired 81,659.

The passenger situation requires special comment. The greatly improved highways and the tremendous number of private automobiles operated upon them have largely revolutionized American life. The impact has fallen particularly upon the railroads' passenger service.

In the days of horsedrawn vehicles and generally poor roads, people were largely dependent for land transportation upon the railroads. This changed radically with the advent of the passenger automobile. It is not simply a question of cost, or even of the service rendered. The automobile provides a different type of travel, gives a sense of independence from timetables, and is enjoyed for its own sake by many persons. There has resulted such a decline in rail passenger movement that it is impossible for the railroads, on many branch lines, to furnish passenger service except at a loss which constitutes a burden upon other traffic.

During the years 1924-1926 the railroads of the country had over 65,000 passenger train cars, including Pullman cars, of which over 51,000 were passenger-carrying cars. Then the number declined to 45,224 in 1940 and is about that at present. About 15 percent of the passenger train cars are less than 16 years old, about 45 percent are 16 to 30 years old, and the balance, about 40 percent, are 30 years or older.

I have tried to outline briefly the situation with regard to the physical plant of the carriers. The picture would not be complete, however, if I failed to mention certain other matters which, in the aggregate, vitally affect, and may determine, the ability of the railroads to meet the needs of the Armed Forces in the event of war. Some of the matters to be mentioned are controversial. I shall not attempt

to argue the applicable law or the wisdom of various courses, but simply invite your attention to certain facts and their probable results.

With a few exceptions, the railroads have no means of securing funds essential for their operation and for additional capital except through sale of their securities or earnings from their transportation services.

To sell additional stock would be very difficult for most railroads. In the years 1931-1940, inclusive, cash dividends averaged only 1.79 percent. Over 61 percent of the stock, on the average, paid no dividends. Moreover, during part of that period about 30 percent of the railroad mileage was in bankruptcy and, in the reorganization proceedings, it was customary to wipe out the common stock. Even during the busy years 1941-1947, inclusive, cash dividends ranged from 2.34 to 3.09 percent. The sale of railroad stock as a means of raising substantial sums of additional capital may be discarded so far as the great bulk of railroads is concerned.

Some railroads could sell their bonds on reasonably attractive terms. This would, of course, increase debt and fixed charges. But the Interstate Commerce Commission repeatedly has urged railroads to reduce their bonded debt and their fixed charges. (See Annual Reports for 1933 (pp. 25-26,) 1938 (pp. 3 and 9,) 1941 (p. 2,) 1942 (pp. 26-29,) 1943 (pp. 24-26,) 1944 (pp. 13-15,) 1945 (pp. 19-20,) and 1946 (pp. 19-21).) In October 1948, the Commission pointed out that unmatured debt of the railroads (including equipment obligations) outstanding in the hands of non-railway owners had been reduced from $11,880,000,000 in 1930 to $8,299,000,000 in 1947, or 30.1 percent. This has now been further reduced to $8,000,000,000. These reductions were accomplished primarily as a result of financial reorganizations of certain railroads under the Bankruptcy Act and of debt retirement by other carriers.

It would seem that reduction of indebtedness is an established policy of the law. I should regard it as a backward step, injurious to the public interest, to force the railroads deeper into debt in order to put their physical plant in proper condition fully to serve all prospective shippers and travelers.

The alternative is to allow the railroads an opportunity to earn sufficient income to enable them to maintain their physical plant in good condition and, year by year, to improve and adapt it to the needs of the Nation.

Railroad expenses have risen much faster than earnings. Taking as a base, the investment of class I railroads, after accrued depreciation and amortization, we find that the rate of return averaged 4.76 percent for the five years 1926-1930; 1.95 percent for the five years 1931-1935; 2.50 percent for the five years 1936-1940; and 4.97 percent for the five

years 1941-1945. The rates were 2.75 percent in 1946, 3.41 percent in 1947, and 4.38 percent in 1948. These returns did not reach the investor. Instead, a substantial part of the net railway operating income was used to improve the properties.

One reason for this is that "depreciation" is computed on original cost. With a car or locomotive, for example, the theory is that, when the unit is retired, the depreciation accrued during its life, plus its salvage value will equal its original cost. In practice, however, when a railroad retires a car it must buy or build one to take its place; this will cost more than twice the original cost of the old car.

What has just been said applies to the requirement for additional capital simply to stay in business. If many desirable improvements in the railroad plant are to be made, still more capital is needed.

Every kind of productive activity in the United States has made spectacular progress by introducing and perfecting new means of increasing output and making better goods. This is true of farming, mining, and manufacturing--the three basic sources of material wealth. The demand for capital to continue this program of expansion and modernization in other industries is a matter of common knowledge. Railroads are in similar need of making capital additions and improvements in order to give the up-to-date service the country should have, and also in order to take advantage of technological advances which will increase their efficiency and capacity.

Their first and vital need, of course, is to replace their old, worn-out cars and locomotives with units of the latest types and to add some new units. Equally necessary, but not so obvious is the replacing of more old track rail than has been done, in order to catch up on the wear and tear due to the heavy traffic since 1940. A more extensive program of modernization of shops and shop tools should also be undertaken. Many railroad shops are not so well equipped or so well arranged as they should be, and many railroad shop tools are obsolescent. Precision tools are needed.

Some of the improvements which are highly desirable, such as straightening main line, reducing grades, and easing the transition from tangent to curved track, or from one gradient to another, may not at once be productive in the sense of adding revenue or reducing expense, and, therefore, can be made only if the railroads have sufficient earnings. They are, however, the very type of improvements which are important from a military standpoint; that is, they will enable the railroads to handle a large volume of traffic at high speed.

The railroads have only a limited control over their revenues and their major costs. Their revenues are derived from published rates, fares, and charges; they are subject to Federal and State regulation.

Confronted with rising wages and prices of materials and supplies, the railroads have been compelled to seek increased freight rates and charges. The general procedure is to file with the Interstate Commerce Commission a petition seeking authority to make effective the rates and charges named therein. The Commission evidently considers a hearing necessary, and this results in some delay, despite the Commission's efforts to expedite such hearings. In 1948, the railroads asked for an immediate small increase, leaving the balance of their proposal to be dealt with after hearing. Instead, the Commission conducted a preliminary hearing, and granted a part of the interim increase sought, leaving the rest for further hearing. The most recent rate increase, effective 11 January, 1949, was estimated by the Commission's Bureau of Transport Economics and Statistics to amount to about 5.2 percent. The Bureau also said that, since 30 June 1946, the Commission has authorized increases in freight rates which, on a cumulative average basis, have amounted to about 51.7 percent. For the Western District, the average is 47.4 percent. It should be added, however, that the 30 June 1946 rates were on a prewar basis. Except for a small increase which was effective for some months in 1942 and 1943, the railroads went through the war and almost a year beyond its close at the prewar rate level. This, coupled with the fact that there always is a "lag" between the increased expenses imposed on the railroads and the time increased rates can be made effective, means that, in the aggregate, enormous amounts of additional expenses have had to be absorbed by the railroads. In common with other railroad executives, I dislike to increase our rates, fares, and charges; but I know of no alternative if the railroads are to continue to operate and serve the country under private ownership.

In its 1948 Annual Report, page 2, the Interstate Commerce Commission discussed rate increases which it had authorized and said:

> "No immediate alternative to large and successive increases existed, however, if the railroads were to have the relief to which they were entitled under the act and which was essential for the maintenance of adequate rail service in peace and in national emergencies."

The Commission also said, page 3:

> "For a number of reasons, the railroads in their own interests must not rely or expect us to rely solely on what their cost sheets show. Rate increases may be carried to a point where they are largely self-defeating."

The Commission, although recognizing the difficulties confronting the railroads, said that "much more must be done to increase the efficiency and reduce the costs of railroad operation."

As a practical matter, the three most important elements of cost are largely if not wholly beyond the control of the railroads. In December 1948, wage rates were 86.5 percent above those of 1939, materi prices were 123 percent, and the weighted average for all unit costs wa 95.2 percent, over 1939. But freight rates were only 44.2 percent and passenger fares 25.4 percent over 1939. The recently authorized rate increases bring the cumulative percentage up to 51.7 percent for the whole country, far below the increased expenses just mentioned. In practice, the railroads have not received the full benefit of the authorized increases, as some of the States have not granted corresponding increases in intrastate rates, and it is necessary to make some adjustments of the rates to meet competition and restore rate relationships.

Another very important item in operating the railroads is taxes. In 1918 they were $223,175,000; in 1923, $331,915,000; in 1928, $389,432,000; and in 1938, $340,782,000. The peak was reached in 1943, with $1,849,195,000. In 1947 and 1948 tax accruals were, respectively, $936,000,000, and $1,028,000,000.

Measuring the work done by the railroads in terms of revenue ton-miles, we find that in 1929, the greatest performance prior to World War II, class I railroads carried 447,322,000,000 ton-miles. The maximum effort was in 1944, when the figure was 737,246,000,000. In 1947, it was 654,728,000,000; in 1948 it was 640,000,000,000. This showing in the face of difficulty in securing materials and supplies, particularly steel, indicates a considerable degree of efficiency. This is borne out, on the whole, by comparison over the years of variou measures of efficiency, such as ton-miles per freight train hour, average train load and car load, train speed, etc.

Two of the efficiency problems confronted by the railroads are the abandonment of unremunerative branch lines and the removal of unprofitable passenger trains. When such branch lines have outlived their usefulness, and when the former patrons of the losing passenger trains have transferred their patronage to the buses or travel by private automobile, continued maintenance of such lines and trains is a burden upon other traffic. In the case of the branch lines, quite generally authority is secured from the Interstate Commerce Commission to abandon them. The removal of passenger trains, however, is not within the jurisdiction of the Interstate Commerce Commission and quite frequently, where permission of the State authorities is required, great difficulty is experienced in securing necessary authority.

This discussion would not be complete without some reference to what are known as the "Government Reparation Cases." Seventeen complaints were filed with the Interstate Commerce Commission in the name of the United States. While most of the complaints state that the exact amount of the reparation sought cannot be determined, statements made by spokesmen for the Department of Justice indicate that

the Government is seeking to recover 2 billion dollars or more. As I said earlier, I shall not undertake to argue the law or the merits of the cases, but, from a practical standpoint, if the Government could secure judgments against the railroads for any substantial part of the reparation demanded, it would impair, if not destroy, the ability of the railroads to make expenditures necessary to maintain and improve their properties in such manner as to render service adequate to meet the civil and military needs of the country.

I have endeavored to give you a picture of the railroad situation, without taking either a gloomy or an optimistic view. Just what the future holds, no one can predict. If the people of the country so desire, they can have a railroad system which will meet the changing and increasing civil and military needs of the country with constantly improving service. On the other hand, if oppressive laws are enacted, or undue favors extended to other and competing agencies of transportation, or the administration of the laws is harsh and unintelligent, the railroads cannot give as good or as much service as they might otherwise. The railroads have no magic formula by which they can pay greatly increased wages and prices for the things they buy, and tremendous taxes, without securing additional revenue from their only product, namely transportation. The desire of the public, as put into effect by its duly elected or appointed representatives, will determine the outcome.

The military needs of the country must, of course, be paramount in time of war; but it is my conviction that the best results would be achieved by disturbing as little as possible the transportation machine. That is, the Armed Forces would come closer to securing what they desire in the way of transportation, if they would make railroad management responsible for the results, than if the Government itself should take over the railroads and endeavor to create a new organization to operate them.

COLONEL HORNOR: I am sure that after this excellent lecture there must be some questions on the future of the railroads that you would like to have Mr. Budd enlarge on.

QUESTION: Mr. Budd, in regard to the propulsion of locomotives, would you comment on the present and future trends in gas turbine engines?

MR. BUDD: There are some experimental turbine engines, but I think very little is known about the rapidity of that progress. At least I do not know very much about it. I assume that those who have been most interested in that research job have reached the conclusion that it is not going to be available very soon. Some of them have in the meantime put in large orders for Diesel locomotives; I think they would not have done that if there had been a likelihood of the gas

turbine locomotive becoming practical in the near future. It takes about a year with the present backlogs to get a Diesel locomotive if ordered n

I think, and perhaps you well know, that the one difficulty they are encountering with this gas turbine is the intense heat generated. The problem is to find metals that will stand up to that intense heat.

QUESTION: With regard to this deferred roadbed maintenance, what progress has been made, if any, on the backlog of maintenance that was accumulated during the war years of heavy freight haul? You mentioned 560 million dollars as the deferred maintenance as of 31 December 1948. It looked to me as if the whole country exploded as soon as the snow got off the ground last year. I saw roadbed maintenance going on everywhere. Are you getting anywhere on that deferred maintenance, or is it going backward?

MR. BUDD: When you say the whole country exploded, you don't mean the railroads? You mean the highways, don't you?

QUESTION: It looked to me as if there was a lot of railroad maintenance going on also.

MR. BUDD: It is true, of course, that in the northern part of the country we have to do our maintenance in the summer months after the track thaws out. I think we made some headway last year. I think your observation is correct. On the railroads we did make some progress

So far as the riding qualities of the tracks are concerned, of course, labor will take the place of new rails. You can smooth up an old road by the use of old rails. Our track rides well today generally speaking; or, if not today, because we are in the midst of winter, it will next summer ride well again.

The deferred maintenance which the Interstate Commerce Commission Bureau referred to and which I have in mind is the restoration of the potential tonnage of rail that was taken out by the heavy traffic. There is almost a direct relationship between the tons of rail that ought to be laid and the ton-miles of traffic that have over the tracks. I think if we laid about one year's new rail allotment within the next three years above what we normally should lay, we probably would be caught up on the rail requirements. One year's new rail would be anywhere from one and a half million to two million tons; I should say that amount would take care of deferred maintenance.

The importance of that from the military standpoint is that in an emergency, the traffic becomes so very heavy and the general demand for steel becomes so great that while railroads need rail worse they have no difficulty getting it. One means of preparing for a war emergency would be getting the rail laid in advance.

There is this advantage in not having laid the rail some time ago: The quality of the rail now will be better. The internal fissures that were encountered in the older rail are practically eliminated from the newly manufactured rail so far as our experience goes. For that reason the track laid with new rail will be better track than it would have been some time ago. It is not an insurmountable thing to catch up on deferred maintenance in, say, a matter of three years—not much sooner than that.

QUESTION: In a recent issue of "Time" they discussed a conveyor belt 130-some miles long, used for carrying ore. Do you anticipate running into competition with that sort of installation, or do you consider that just an experiement?

MR. BUDD. That seems to me a pretty long belt conveyor. I do know that the belt conveyor has been a very efficient way of moving large quantities of earth and rock on some big construction jobs in recent years. I suppose it is a potential competitor. I have read about it. Until the present company took over, I had not thought of it as anything more than theoretical.

QUESTION: If the railroads were freed of all regulation and allowed to charge whatever rates they pleased, do you believe that they could make money and still not abandon so much traffic that they would endanger our railroad network for national defense purposes?

MR. BUDD: I would not favor the abandonment of all regulation. I think we must have regulation. I believe that with as many railroads as there are, so different in size and the fact that the areas which they cover are so different, we must have regulation.

I do think that regulation over the years could have been carried on in a way that would have been less miserly as to earnings.

What I believe would bring about the best results in the broadest sense of the public interest, military and otherwise, would be to permit the roads to make those rate increases they find are necessary and for which they make their cases based on additional revenue needs, and then let the railroads be the judges as to where and when they ought to reduce rates from that level to which they are permitted to go. In other words, the rate structure is a plateau, which must be adjusted to fit the competition where it is with the provision that unremunerative rates ought not to be made.

I think the best way to find out where to get revenue and how to get it is for the Interstate Commerce Commission to treat the matter as a managerial function of the railroads and permit general increases when increased revenue is needed, and then let railroads reduce some rates to hold traffic and meet competition. They cannot very well do that

if the general level is not high enough to start with. In other words, I think there should be more freedom in the matter of rates, but I would not advocate complete freedom. We need regulation; we must have it.

Now, some of the competitors of railroads are practically free from regulation as to rates. The common carrier on the highways is important but in my opinion not so important from the standpoint of loss of rail traffic as the private or contract highway carrier, who is able to pick and choose what traffic will be taken and take it at whatever rate is necessary to get a load both ways.

Then another type of carrier that is moving a large amount of freight is what I call the captive truck. A captive truck is part of a fleet belonging to an industry or store. Those fleets, of course, are carrying goods owned by the owner of the trucks. Their operation is a part of his business, and rates in such cases are not considered.

The other thing railroads complain about a great deal is that they are strictly common carriers; that is, they carry everything that is offered and anywhere it is offered. Their competition picks and chooses a great deal. Although they may be regarded as common carriers, trucks find a way to take the desirable goods which they want to take, and to not carry some of the less desirable business that earns less.

QUESTION: What are the probable upper limits to increased speed of operations? Let us take two specific examples: New York to Chicago and New York to the west coast. How much do you think the railroads will be able to reduce their time for a trainload of munitions from New York to Chicago and from New York to San Francisco?

MR. BUDD: The distance from New York to Chicago is about a thousand miles. The New York Central is longer than the Pennsylvania but the Pennsylvania has to go over the mountains, while the New York Central does not. So I think the two are about on a parity so far as time is concerned.

Those roads east of Chicago have somewhat different speed limits from those west of Chicago. They generally hold their trains to 80 miles an hour, I believe. Between New York and Chicago on account of the large population it is possible to have service between points like Cleveland and New York and Cleveland and Chicago, Detroit and New York and Detroit and Chicago, to take care of that business, making it possible to run the Chicago to New York service right through those big cities. We can't do that in the West. We have to stop more frequently. So in the East they make a pretty good comparison with us on the over-all schedules. They don't have to run so fast between stops because they don't stop so often.

If you should apply our top speed to these eastern roads, you could reduce their time quite a little. On nonrestricted track we run our trains frequently at 95 to 100 miles an hour.

I was talking in this paper about reducing the curvature and eliminating curvature, about the need for doing things like that. I think from the standpoint you are discussing that that is one of the most important improvements we could make. If you just re-lay track with better rails and fix up the present lines so trains can run a little faster over them, that would be one way of reducing the time. But if you single out a 2,000-mile stretch, say between Chicago and the west coast, in a dozen places or more there are grade restrictions. Wipe them off;--make them unrestricted; and you could then run a lot faster.

On this matter of high speed maintenance, where less curvature is necessary to go to the one-degree curve, which we regard as the maximum curve for unrestricted speed, requires a great deal of construction work. The three-degree curve, for example, has a radius of 1,900 feet and the one-degree curve has a radius of 5,700 feet. To change requires a great deal of construction work and gets into difficult terrain. You cannot do that in the mountains, but you can do it in the plains. I should say that by shortening the distance and easing the curvature the time could be reduced a day or so for a munitions train from New York to the west coast.

I believe I am correct in saying that for many years the labor-management relationship of the railroads was held up to the rest of the country as excellent. Here in recent years that does not seem to be true. Would you care to comment on the present labor-management relationship in the railroads?

MR. BUDD: Yes; I will comment on anything. I can't promise to give you the answer, but I will discuss it with you.

It is true that it was felt that the plans by which there would be a so-called cooling-off period in a case submitted to an emergency fact-finding board would serve to prevent stoppages or strikes. That proved to be not the case in recent years, and there have been strikes which required the taking over of the railroads by the military.

There is nothing to prevent that happening again whenever there is a threatened strike. It is impossible to say whether it will happen. There are three cases before Emergency Boards and the situation might be getting worse instead of better.

There is one case before an Emergency Board which has been decided. That is the case of the so-called "nonops," that is, other than the transportation crafts. The Board in that case made its award, and the award was an increase in the pay rate on an hourly basis, with a very

large increase by changing the working conditions, to be effective on 1 September 1949. The men have not accepted that award and they have not declined it. The Board has been called back, unofficially I suppose to clarify the meaning of the award. Its members are meeting in Chicago first with one side and then with the other. So far as I know—it would be within the last couple of days if it happened—they haven't met with both sides present. That is the situation in that particular case. As you may remember, the most costly part of that decision was to put the nonoperating railroad men on a forty-hour week based on forty-eight hour pay.

There is also a hearing before an emergency board going on in Chicago in the case of the locomotive engineers. They threatened to strike unless another engineer was put on a Diesel locomotive to patrol the machinery. That case is being heard in Chicago before a board, and I believe they have extended the time when the board has to bring in its report for 45 days. That would carry it over into April. I think it is safe to assume that there will be no strike while that board is in session or for thirty days after it brings in its findings. But we do not know what will happen then.

Now, the same claim is made by the firemen. They want to patrol the engine room. I noticed in the Washington paper yesterday that the President has appointed a board to hear them. It will in fact be the same board. Gossip has it that the electricians and mechanical men are about to claim that they should patrol the engine room. So there might be two more emergency boards, to see whether we have one, two, three, or four.

It is impossible to say whether the railroad labor people are going to go back to the old plan of accepting Board awards, or whether they will reject them, as they did in the three cases when strikes were put into effect. I wouldn't have any better judgment than any of you on the subject. But I will say that while the negotiations are going on, the two sides are on good terms. They discuss matters and get along all right, although they disagree diametrically.

COLONEL HORNOR: Mr. Budd, on behalf of the Commandant, the staff and faculty, and the student body, I want to thank you for your excellent presentation on the future of our railroads in this country.

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