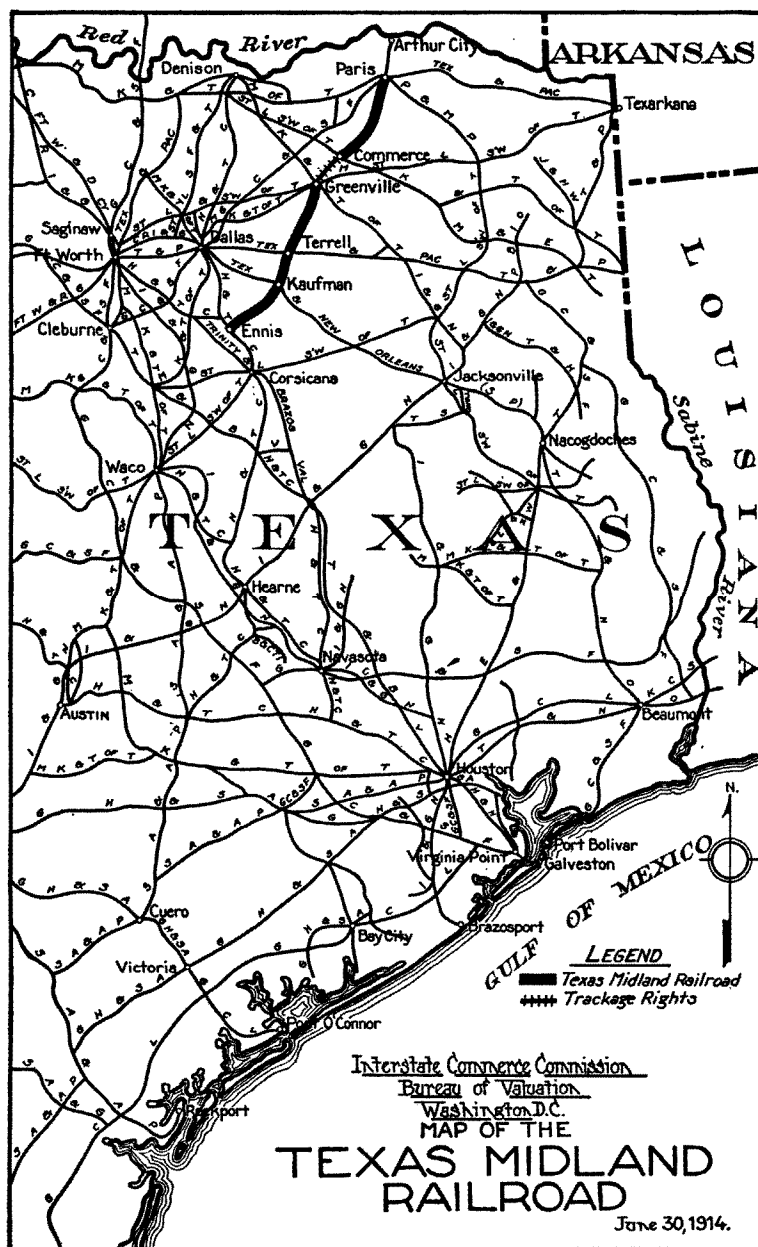




(64365. To face p. 1.)

INTERSTATE COMMERCE COMMISSION REPORTS.

VALUATION DOCKET No. 2. TEXAS MIDLAND RAILROAD.

Submitted December 14, 1917. Decided July 31, 1918.

1. The valuation amendment, section 19a of the act to regulate commerce, authorizes the Commission to find a single sum as the value of the common carrier property for purposes under the act to regulate commerce; and the Commission will ultimately make such finding as to the property of each carrier, supplementing tentative valuations already made in which a single sum is not stated by such findings.
2. In the instant case, findings as to underlying facts are made, with leave to the parties to apply to be heard as to what sum based thereon shall be stated as the value of the property held for the purposes of a common carrier; otherwise the Commission will in course state its conclusions and complete the final valuation.
3. Methods employed in ascertaining the several cost values analyzed and stated. Upon the finding of a single sum as value, further appropriate analysis of the methods and reasons for the differences, if any, will be presented.
4. Original cost to date, which generally can not be ascertained from accounting records alone, will be reported as fully as possible from the best available evidence in each particular case. When the original cost of portions of the common-carrier property, but not of the whole, can be stated, the ascertained facts will be reported; when the cost of no portion of the property can be identified, the carrier's investment account will be shown. Estimates will be resorted to, within comparatively narrow limits, as to minor portions of the property, the cost of which can not be ascertained from records.
5. In requiring a report as to the original cost to date of "each piece of property" owned or used by a carrier, the act can not be narrowly construed. A reasonable construction requires that original cost should be reported in all reasonable detail, and the words refer to various sections of the railroad, rather than the individual ties, rails, and similar elements.
6. Findings of original cost to date will be supplemented in each case by a full statement of the financial history of the carrier which shows the maximum amount of money which was put into the property.
7. The maximum amount which could have been invested by the carrier, its predecessor, or others, ascertained and stated in the instant case as representing the outside limit of original cost of the property of the respondent to date of valuation.

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8. Cost of reproduction new of the common-carrier property ascertained and stated, upon the assumed basis of the nonexistence of the railroad while all other conditions in the same territory were taken as existent on valuation date, that the most practicable and economical construction program is employed, and that to an inventory of items making up the physical property, shall be applied cost prices fairly representative of conditions on valuation date, with the addition of the estimated cost of placing the items in position as of valuation date, and including certain overhead charges.
9. In ascertaining the cost of reproduction new the Commission is not to ignore expenses which would be incurred by reason of the fact that the physical plant, other than land, would have to be built, and is not limited merely to the reporting of an inventory value.
10. The assumption of present conditions of the existing property, rather than of the original construction conditions, is applied in determining questions raised by the protest as to particular accounts in the estimate of cost of reproduction new.
11. Industrial tracks are those which the carrier has not an unrestricted right to use in serving the public, but which it is obligated to use instead, exclusively or preferentially, in serving a particular industry or certain industries. In the cost of reproduction new estimate are included such portions of industry tracks as the carrier has a right to remove if it should discontinue the service, or as were in fact paid for by the carrier in original construction. Industry tracks constructed at the expense of the industry and owned by it are not included in the cost of reproduction new.
12. The words in the valuation act "used by said carrier for its purposes as a common carrier" can not be construed as including property not owned by the carrier where the use of it is only incidental and at the request and for the peculiar benefit of the owner.
13. Under the assumption of present conditions, topographical and otherwise, in determining the cost of reproduction new, sums expended by the carrier in the past for assessments for public improvements will not be included unless the improvement for which the assessment was made is located on the right of way or so closely connected therewith that it would be wiped out if the railroad were removed. Sums actually expended for such improvements are reported in original cost to date when such a figure can be ascertained.
14. The rule stated as to the inventorying of property used by a carrier for common-carrier purposes, but which is owned (1) by other common carriers, or (2) by parties other than a common carrier; and of property which is used jointly with other carriers for common-carrier purposes.
15. No allowance made in the estimate of cost of reproduction new for contingencies as such; but the quantities and prices employed reflect various construction contingencies and fairly represent the amount of money necessary to reproduce the identical property.
16. The percentage plan of stating engineering in the cost of reproduction new is adopted. In stating the cost of reproduction new by the percentage method engineering should be computed on the amount of the investment in the road accounts, exclusive of engineering and land.
17. The percentage method of estimating general expenditures, other than interest during construction, is adopted in determining the cost of reproduction new, and the percentage adopted in the present case is applied to the road accounts, exclusive of land.

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18. In estimating interest during construction, for the purpose of stating the cost of reproduction new, it has been assumed that the credit available is good and uniformly the same and that money is obtainable at the same rate of interest and supplies can be purchased at equally advantageous prices; 6 per cent per annum is assumed as the interest rate and is taken as covering the cost of obtaining money.
19. The period used in determining interest during construction in estimating the cost of reproduction new is taken at one-half of the estimated construction period required for reproduction, plus three months, as to road and general expenditures; and at three months for equipment.
20. Materials and supplies and cash on hand are not included in the estimate of cost of reproduction new; but the amounts on hand, as shown by the carrier's inventory and its general balance sheet, are stated in the tentative and final valuation.
21. In estimating cost of reproduction new, the property to be reproduced is taken as the existing property as it was when put into its present service; and if secondhand materials were used, the cost of reproduction new is estimated for the same kind of materials in the same condition as when installed.
22. The protest of the carrier with respect to the unit prices employed in the estimate of cost of reproduction considered, and various modifications made as to the prices applied to particular classes of material and labor.
23. In estimating the cost of reproduction less depreciation, depreciation has been treated as covering the lessening in the number of units of capacity for service as compared with those existing in the same elements when installed; and upon ascertaining what part of the remaining capacity for service remains, the depreciation which has already accrued is subtracted from the cost of reproduction new and the remainder is given as the cost of reproduction less depreciation. Due consideration is given to existing salvage or scrap value. Depreciation is not taken merely as the equivalent of deferred maintenance or loss of service efficiency. The tentative report herein is corrected as to the service life of certain species of properties.
24. In estimating the cost of reproduction new, as a telegraph line is necessary in the conduct of the business of a carrier, it is assumed that the carrier would equip itself with such facility in the same manner that it did originally, and would be obliged to perform the same amount of work in the theoretical reproduction of the property as it did in the original construction, although a portion of the line was, by agreement, put in the exclusive use of a telegraph company, and the title to the line is in the telegraph company.
25. The present value of the lands owned or used for common-carrier purposes is stated by ascertaining the number of acres and multiplying this acreage by a market value determined from the present fair average market value of similar adjacent and adjoining lands, due allowance being made for any special value which may attach by reason of the peculiar adaptability of the land to railroad use; but nothing additional is added for the expense of acquisition, for severance damages, for engineering, and for interest during construction. For reasons stated, the reproduction cost of carrier lands, and the present cost of condemnation and damages, or of purchase, of a carrier's lands, are not estimated.

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26. When a street or alley in a municipality has been vacated and the carrier uses the land exclusively for common-carrier purposes, the original cost of the land to the carrier, if ascertainable, and its present value, will be included in the inventory as land owned by the carrier, unless it affirmatively appears the carrier does not own it.
27. Where a street or alley in a municipality is used as such by the public, and is also used by the carrier for its common-carrier purposes, along or across the same, no part thereof will be inventoried as land owned by the carrier unless it affirmatively appears that the carrier owns it.
28. Where a highway outside of a municipality is used as such by the public, and is also used by the carrier for its common-carrier purposes, along or across the same, the land jointly used, together with its original cost, if ascertainable, and its present value will be inventoried as land owned by the carrier unless it affirmatively appears that the carrier does not own it.
29. While the valuation act evidently intends to require a statement of all the cost values, and other circumstances which might bear upon the value of the property, at least for rate-making purposes, and appreciation is a fact which may affect the final value of the property, the record herein does not warrant any definite finding either as to the cost or value of such appreciation as has resulted from maintenance, operation, and the effects of time upon the roadbed.
30. The finding in the tentative valuation that "no other values or elements of value were found to exist" is approved upon the record in the instant case, in the light of the fact that in the cost of reproduction new and the cost of reproduction less depreciation figures requisite consideration was given to the fact that the property constitutes a railroad and was doing business, and is not merely an aggregate of materials.
31. Findings and order made as to basic facts in the final valuation of the carrier, to be supplemented by further appropriate finding and order with respect to the value of the property used for common-carrier purposes.

Pierce Butler and Leslie Craven for Texas Midland Railroad.

Charles E. Elmquist for Valuation Committee, National Association of Railway and Utilities Commissioners; *Henry C. Flannery* for Minnesota Railroad & Warehouse Commission; *A. E. Helm* for Public Utilities Commission of Kansas; and *Luther Nickels* for Railroad Commission of Texas.

Glenn E. Plumb for Brotherhood of Locomotive Engineers, Brotherhood of Locomotive Firemen and Enginemen, Order of Railway Conductors, and Brotherhood of Railroad Trainmen.

Rush Taggart for Western Union Telegraph Company.

REPORT OF THE COMMISSION.

BY THE COMMISSION:

The tentative valuation of the Texas Midland Railroad, herein-after referred to as the carrier, was the first which was served under the amendment of March 1, 1913, to the act to regulate commerce,

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"providing for a valuation of the several classes of property of carriers subject thereto and securing information concerning their stocks, bonds, and other securities," hereinafter referred to as the act. In accordance with the provisions of the act, a copy of the tentative valuation of the property of the carrier was served on October 21, 1916, upon the Attorney General of the United States, the governor of Texas, the Texas Midland Railroad, and the Railroad Commission of Texas. These parties, under the provisions of the act, were allowed 30 days within which to file protests against the tentative valuation. The governor of Texas and the Railroad Commission of Texas jointly protested in 2 particulars, and the carrier in 27 particulars.

Together with its protest the carrier submitted a motion praying that all further proceedings be stayed and postponed until the tentative valuation required by law shall have been made and reported, it being contended that the tentative valuation theretofore served was insufficient. However, we proceeded with a hearing upon the merits of the protests which had been filed, and the motion is overruled.

Hearings were held before our examiners, and to some extent before us, which consumed 51 days, and accumulated a record of 8,224 pages. Ten briefs were filed on behalf of the carrier, the valuation committee of the National Association of Railway and Utilities Commissioners, the brotherhoods of railroad employees, the Western Union Telegraph Company, and the bureau of valuation of the Commission, respectively, which aggregated 2,419 pages. Other briefs dealing with the methods to be pursued in valuation work have been filed. In addition to these hearings, questions relating to the application of general principles underlying valuation work were orally argued before us for four days, and questions as to specific facts concerning the value of lands owned or used by the carrier were, by mutual agreement of the parties, argued before the solicitor of the bureau of valuation and a member of the advisory board.

From this statement of the course of this proceeding it is obvious that every opportunity has been afforded interested parties to bring to our attention facts and views pertaining to the valuation of the property of this carrier. We will now consider the protests.

SHALL A SINGLE SUM BE FOUND AS THE VALUE OF THE PROPERTY ?

Does the act require or authorize the Commission to find and report a single sum as the value of the property owned or used for common-carrier purposes? The carriers insist that it does so require and that a tentative valuation which does not include a

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finding of a single sum as the value of such property is not lawful. Other parties to the proceedings are equally insistent that the act does not permit finding a single sum as the value of the common-carrier property. The act clearly distinguishes such property from that held for purposes other than those of a common carrier; and the requirement that as to the latter class of property the original cost and present value shall be stated is met in the tentative valuation.

The act does not specify any purpose for which a value is to be found or to which the valuation is to be put, except as it provides that all valuations by the Commission shall be *prima facie* evidence of the value of the property in all proceedings under the act to regulate commerce, in all judicial proceedings for the enforcement of that act, and in judicial proceedings brought to enjoin, set aside, annul or suspend, in whole or in part, any order of the Commission. While it may be questioned whether or not the act requires the finding of a single sum as the value of the property, we are of opinion that it authorizes the finding of such value for purposes under the act to regulate commerce, and it is our purpose ultimately to make such finding as to each property. Tentative valuations in which a single sum as the value of the property is not stated will in due course be supplemented by such finding and a final valuation, including a single sum as the value of the property, will be duly issued.

Although we have determined that eventually a final value will be fixed herein, it does not follow that in this case the proceedings had under the tentative valuation served will go for naught or need be repeated, merely because the tentative valuation served at the outset stated no single sum as the value of the property. We have an administrative function, partly judicial in character, and the essential thing is that all concerned shall be apprised of the nature of the proceeding and shall be fully heard as to their claims. In this case the carrier has protested the failure to state a single sum as value, but neither the Attorney General of the United States, the state authorities of the state of Texas, or any other appearing party, has questioned what has been done in that regard. All of the basic facts upon which a judgment is to be formed as to the sum to be found as value for the purposes of the act to regulate commerce are before us, and the issues as to them are wholly independent of what shall be deduced from them. The carrier has been heard fully upon these basic facts, and has, by its active participation, assisted materially in developing a record such as to enable us to make full findings. The record herein is extremely voluminous, and has required the expenditure of great sums by the Government, the carrier, and the other appearing parties. Everyone has been heard fully, in fact, exhaustively. There remains for us but the one step of deducing

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from the facts stated the sum we are to find for such purposes. The carrier has stated its views upon this question in oral argument and has fortified its oral argument by written briefs, in which it has fully set forth its claim, that in the instant case reproduction cost new is the sum which is to be stated as value, both for the purposes of the act to regulate commerce and for all other purposes. The other parties appearing have been heard upon the same general question, and have each stated their theories as to how the value for rate purposes is to be deduced from the basic facts.

Under the circumstances of the instant case full justice will be done if the findings made as to underlying facts stand, with leave to the carrier and other parties to apply to be heard upon the undetermined question as to what sum shall be stated. Otherwise we shall state our conclusion in due course and complete the final valuation of the carrier.

ANALYSIS OF METHODS.

The carrier protests that the tentative valuation does not contain an analysis of the methods by which the (1) cost of reproduction new, cost of reproduction less depreciation, (2) original cost and present value of property held for purposes other than those of a common carrier, and (3) absence of "other values and elements of value" were obtained, and the reason for the differences in each case. It contends that the analysis of methods, and statement of the reasons for differences mentioned in the latter portion of the paragraph entitled "First" and in the paragraph entitled "Third," should accompany and be made a part of the tentative valuation.

An analysis of the methods employed in ascertaining the several cost values is presented in Appendix 3 to this report, which, by reference, may be made a part of subsequent tentative valuations. When a finding as to a single sum value of the property is announced, such analysis of the methods by which it is arrived at and the reasons for the differences, if any, as is appropriate, will be presented.

ORIGINAL COST TO DATE.

In the tentative valuation it was stated that the "original cost of road could not be found." Figures purporting to show original cost of equipment and land were, however, reported. The corporate and financial history of the carrier, together with a statement of its gross and net earnings from the time it began operations to valuation date, has also been incorporated. From the tentative valuation it is possible to ascertain the amount of money which has been expended in the property as accurately as the records of the carrier permit. Since

the service of the tentative valuation certain other sources of information have been made available to us and made of record, which now permit a statement to be made of at least the maximum original cost.

The carrier in its protest states that the tentative valuation "does not disclose, nor can there be determined therefrom, the true original cost to date of all property owned or used by the carrier for its purposes as a common carrier." No evidence, however, was submitted by the carrier upon this point. The governor and Railroad Commission of Texas protested the omission to find original cost to date and introduced evidence as to certain costs.

The act requires us to ascertain original cost to date. This is a fact of prime importance. Every effort is being made to secure this information. The experience of the bureau indicates that in most cases it will be impossible to report original cost to date from accounting records alone.

Original cost to date will be reported as fully as it can be ascertained from the best evidence which is practically available in each particular case, and which seems to us to carry weight as establishing the fact called for by Congress. If it is not possible to show original cost to date for all of the carrier property, but it can be ascertained for a portion of the property, that fact will be reported. In the event that it is impossible to identify the cost of any portion of the property, the total amount on the books of the carrier properly assigned to the road and equipment account will be shown, with an explanation that the authenticity of the amount can not be verified. Whenever the original cost of the greater portion of the property can be ascertained, and as to minor parts can not be ascertained from records, we shall within comparatively narrow limits estimate the original cost of such minor portions so as to show original cost of the whole property as closely as may be, and the maximum limit, stating fully the method pursued.

The act requires us to ascertain and report the original cost to date "in detail as to each piece of property owned or used" by a common carrier, but does not define "each piece of property." If this requirement is narrowly construed, it means that we are obliged to ascertain and report the original cost of every tie, rail, etc., which would be impossible because the identity of ties, rails, and similar objects can not be determined. Clearly, this language is not to be literally and strictly applied. It is to be given a reasonable and sensible construction. What Congress apparently meant by "each piece of property" was that original cost in all reasonable detail should be reported. As a practical matter the words may be taken as referring to various sections of the railroad, made up of many

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species of physical articles. So far as identification is possible an effort has been made to ascertain the original cost of railroad property by sections, divisions, or other portions.

Our findings as to original cost will be supplemented by a full statement of the financial history of the road, including the issuance of securities. These facts, it is believed, will show the maximum amount of money which could have been put into the property, and these will thus be a reasonable and substantial compliance with the act.

In the instant case we are able to give a figure which clearly represents, within reasonably close limits of accuracy, the maximum amount of money which this carrier, its predecessor, or any other person or persons, invested in the property, as representing the maximum original cost to date thereof. In Exhibit A to Appendix 2 this sum, \$2,892,360.94, is classified by the primary accounts carried in our system of accounts for investment in road and equipment of steam roads.

Railroads now generally represent the results of the merger and consolidation of separate organizations. In many instances of purchase the records and account books of the original companies were withheld in the transfer of the property and now can not be located; in other instances the records have been destroyed. So as to a majority of the older railroads now a part of present organizations no books of account relating to original construction can be found.

This Commission was created in 1887. Some railroads had then been in existence for about 50 years. While the Commission had considered uniform methods of railroad accounting before 1897, it was not until that year that any official announcement was made regarding the subject. On August 23, 1897, the Commission issued a bulletin entitled "Classification of Construction Expenses." This bulletin contained what the Commission considered proper items to be charged as construction expenses, and recommended that the methods therein set forth be followed by all of the steam roads in the United States. The bulletin was merely suggestive in character, for at that time the Commission had no power to enforce its observance.

By the amendment to the act to regulate commerce of June 29, 1906, we were given power to prescribe and enforce a uniform system of accounts. On July 1, 1907, a bulletin entitled "Classification of Expenditures for Road and Equipment" for steam carriers was issued. There was no legal requirement for uniformity in railroad accounting prior to July 1, 1907. The administrative suggestions made in the 1897 bulletin were not generally complied with, and

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prior to July 1, 1907, the books of carriers were kept in the manner most convenient to themselves. The method of treatment of construction expenses, as now embraced in the road and equipment accounts, was different with different companies, so that, generally, the results shown in the road and equipment accounts to-day do not set forth correctly or adequately the cost of construction of the different parts of the railroad.

This condition was found by our accounting force on the Texas Midland Railroad. When the bureau realized that it was impossible to obtain accurate information from the books of the company concerning original cost to date, it reconstructed the accounts upon what it believed to be a proper basis. To accomplish this it was necessary to examine every voucher which had been issued by the carrier for the payment of money since 1893, the date when its operations began.

The nucleus of the Texas Midland was a portion of the Texas Central Railway, 52 miles long, known as the Northeastern branch. This began operations in 1882; and, while the books of account concerning it were located later, and the substance of them has been made of record herein, it has been impossible to find the vouchers for the payment of the money during the actual construction of that piece of road. Difficulties arose in the examination of subsequent vouchers of the Texas Midland Railroad. For instance, on vouchers which had been indorsed "construction" the word "construction" had been crossed out and the words "operating expenses" substituted, and the amount charged to operating expenses. Other vouchers marked "construction" were charged directly to operating expenses. In still other instances apparent property costs were charged into the reserve account. Vouchers for materials entering into bridges were found, but nothing to indicate the bridge into which the material was placed. With reference to road and equipment account an amount aggregating \$185,000 was found in operating expenses; an amount aggregating \$450,000 in income account; an amount aggregating \$27,000 in suspense account; an amount of approximately \$500 in miscellaneous income account; and a credit of approximately \$100 in miscellaneous revenues account. Instances of this character could be multiplied, but the above sufficiently show why it is impossible to determine precisely the amount of money which has been spent in the production of the carrier's property, and which is a proper charge to road and equipment. The work of reconstructing the accounts from the vouchers was done with as much accuracy as possible.

Although it is known that a small portion of the Northeastern branch, 1.93 miles, has been discontinued, no credit has been entered

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in the road and equipment account of the Texas Midland because of this abandonment. The accounting rules of the Commission require that in case the value of any item of property retired is not shown separately in the ledger, the ledger value of that item which should be credited to the road and equipment account shall be its proportionate share of the value of the entire group in which the particular property is located. Upon a mileage prorate of the total cost of the Northeastern branch as shown by the books of account of the Texas Central the proportionate share to be credited to the road and equipment account because of the abandonment of the 1.93 miles would be \$20,426.52. The abandonment occurred in 1896. In 1894, the Railroad Commission of Texas, pursuant to the requirements of the state statute, made an estimate of the cost of the Northeastern branch, which was served upon the Texas Central by the Texas commission and to which no exception was taken. From the detail sheets of this estimate, made of record herein, it appears that the estimated cost of the 1.93 miles was \$19,277.54. The latter estimate probably more nearly represents the proportionate share of the abandoned line, and may fairly be taken as an offset to the maximum original cost figure shown, \$2,911,638.48, so that the remainder, \$2,892,360.94, can be reasonably stated as the maximum of original cost for the present road and equipment, lands included.

COST OF REPRODUCTION NEW.

In complying with the requirement of the act that "the Commission shall ascertain and report in detail * * * the cost of reproduction new" of each piece of property owned or used by a common carrier for common-carrier purposes, we have proceeded upon the theory that the property under valuation is nonexistent. In the tentative valuation in this case we find that the cost of reproduction new of road and equipment, exclusive of lands, is \$3,382,004, arrived at in the following manner: The engineer making the estimate assumed that the road was not in existence. All other conditions in the territory through which the road runs were taken as they existed on valuation date. The engineer then prepared what he conceived to be the most practicable and economical program for the construction of the road. The items which make up the physical property were then inventoried and cost prices fairly representative of conditions on valuation date were applied. To the figures thus obtained was added the estimated cost of placing the items in position as of valuation date, including certain overhead charges. The result thus arrived at is the cost of reproduction new.

This method of estimating cost of reproduction new is attacked by the Minnesota Railroad & Warehouse Commission as being within

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the prohibition announced by the Supreme Court of the United States in the *Minnesota Rate Cases*, 230 U. S., 352. It is contended that this decision condemned any cost of reproduction new ascertained by an assumption of the nonexistence of the railroad under valuation while at the same time assuming the existence of cities, industries, and other developments alongside the railroad. The following quotation from the decision of the Supreme Court above cited, at page 452, is referred to as supporting this contention:

Moreover, it is manifest that an attempt to estimate what would be the actual cost of acquiring the right-of-way, if the railroad were not there, is to indulge in mere speculation. The railroad has long been established; to it have been linked the activities of agriculture, industry and trade. Communities have long been dependent upon its service, and their growth and development have been conditioned upon the facilities it has provided. The uses of property in the communities which it serves are to a large degree determined by it. The values of property along its line largely depend upon its existence. It is an integral part of the communal life. The assumption of its nonexistence, and at the same time that the values that rest upon it remain unchanged, is impossible and can not be entertained. The conditions of ownership of the property and the amounts which would have to be paid in acquiring the right-of-way, supposing the railroad to be removed, are wholly beyond reach of any process of rational determination. The cost-of-reproduction method is of service in ascertaining the present value of the plant, when it is reasonably applied and when the cost of reproducing the property may be ascertained with a proper degree of certainty. But it does not justify the acceptance of results which depend upon mere conjecture. * * *

Especial attention is directed by the Minnesota commission to the second last sentence of the above quotation, it being asserted that while the court was considering particularly the method used in ascertaining the reproduction cost of land, the words "the plant" were used advisedly for the purpose of condemning that particular method of securing cost of reproduction new, not only so far as land was concerned, but also with respect to all the other property of a railroad.

The Minnesota commission further contends that we have construed the words "cost of reproduction new" too literally; that "cost of reproduction new" is in reality a misnomer, and that what should be reported is inventory value at valuation date. In other words, we should ascertain the cost of the railroad property as it stands on valuation date without taking into consideration any expense which would be incurred by reason of the fact that it would have to be built. By applying this method to the instant case, it is asserted that the figure reported by us is too high by at least \$630,151, or approximately 23 per cent. This alleged excess is made up of what are said to be improper charges to engineering, grading, bridges, trestles and

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culverts, ties, rails, other track materials, ballast, tracklaying and surfacing, buildings, signals and interlockers, other road expenditures, steam locomotives, and general expenditures. It is further claimed that this amount does not cover all excessive allowances, but that a complete analysis of the tentative estimate would raise this to at least 33 per cent of the correct present cost of reproduction. In the event that we can not accept the theory as outlined above, the Minnesota commission requests that in the valuation which is finally reported these alleged excessive allowances be set out separately so that a correct amount representing cost of reproduction new can be stated when the courts have laid down the proper principles to apply.

We can not accept the view of the Minnesota commission that the decision of the Supreme Court in the *Minnesota Rate Cases*, *supra*, condemned the method employed by us in securing cost of reproduction new. In our view the language of the court relied on in this respect relates to railway rights of way, yards, and terminals, and not to railroad property other than land. At page 453 the court said:

* * * The estimates before us, as approved by the master, with his increase of 25 per cent in the case of the Duluth property, must be taken to be estimates of the "railway value" of the land; and whether or not this is conceived of as paid to other owners upon a hypothetical reacquisition of the property is not controlling when we come to the substantial question to be decided.

That question is whether, in determining the fair present value of the property of the railroad company as a basis of its charges to the public, it is entitled to a valuation of its right-of-way not only in excess of the amount invested in it, but also in excess of the market value of contiguous and similarly situated property. * * *

and on page 455:

Assuming that the company is entitled to a reasonable share in the general prosperity of the communities which it serves, and thus to attribute to its property an increase in value, still the increase so allowed, apart from any improvements it may make, can not properly extend beyond the fair average of the normal market value of land in the vicinity having a similar character. Otherwise we enter the realm of mere conjecture. We therefore hold that it was error to base the estimates of value of the right-of-way, yards and terminals upon the so-called "railway value" of the property. The company would certainly have no ground of complaint if it were allowed a value for these lands equal to the fair average market value of similar land in the vicinity, without additions by the use of multipliers, or otherwise, to cover hypothetical outlays. The allowances made below for a conjectural cost of acquisition and consequential damages must be disapproved; and, in this view, we also think it was error to add to the amount taken as the present value of the lands the further sums, calculated on that value, which were embraced in the items of "engineering, superintendence, legal expenses," "contingencies" and "interest during construction."

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On page 456 the court further said:

The property other than land, as the detailed statement shows, embraced all items of construction, including roadbed, bridges, tunnels, etc., structures of every sort, and all appliances and equipment. The cost of reproduction new was ascertained by reference to the prices for such work and property. In view of the range of the questions we have been called upon to consider, we shall not extend this opinion for the purpose of reviewing this estimate, or of passing upon exceptions to various items in it, as their disposition would not affect the result.

Furthermore, it should be stated that in the decisions in *Cedar Rapids Gas Co. v. Cedar Rapids*, 223 U. S., 655, *Des Moines Gas Co. v. Des Moines*, 238 U. S., 153, and other cases, the method pursued by us in securing cost of reproduction new was before the Supreme Court, and in no instance is there an intimation that the method pursued was unlawful. We do not think, therefore, that the *Minnesota Rate Cases*, *supra*, can be construed as condemning the Commission's theory in securing cost of reproduction new. Furthermore, so far as we know, this basis for reporting cost of reproduction new has been universally used ever since the valuation of public utilities has been attempted. Cost of reproduction new, as applied to the items embraced in the engineering report, must be assumed to mean exactly what the words themselves imply, namely, that a railroad actually being operated is conceived of as nonexistent and then theoretically brought into existence by a succession of steps well known to competent engineers.

TOPOGRAPHICAL CONDITIONS.

It can be readily seen that in reproducing a railroad to-day the topography of the surrounding country may be and probably is different from what it was when the railroad was originally constructed. The difference in conditions is probably greater in the case of an old railroad than in the case of one recently built. Cultivated lands through which the railroad runs to-day may have been part of a forest at the time of original construction. Necessarily, therefore, the amount of clearing and grubbing which would be performed to-day in a theoretical reproduction of a railroad under valuation would be considerably less than that which was done in connection with original construction. The determination of the question whether original or present conditions shall govern in ascertaining the estimate to be made in cost of reproduction new is therefore important.

Under "grading," which is account No. 3, in cost of reproduction new, we have estimated \$10,550 for clearing and grubbing, made up of 353.63 acres of clearing at \$25 per acre and 41.72 acres of grubbing at \$40 per acre. The quantities employed were estimated

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according to the extent of timber contiguous to the right of way of the carrier on valuation date. The unit prices reflect representative contract prices for similar work in the vicinity. The carrier insists that the estimate of the cost of reproduction new must include the full amount of clearing and grubbing which was done at the time the road was built. It was agreed between the carrier and the bureau that the amount of work originally done was 566 acres of clearing and 133 acres of grubbing, and that, if we should decide that original conditions should govern, these figures would be substituted for those now contained in the tentative valuation.

The bureau, in its estimates of reproduction cost, has in this respect disregarded conditions existing at the time of construction and has considered the right of way of the carrier in connection with the land which adjoins it on valuation date. For example, if tillage land is on either side of the right of way, the right of way is treated as similarly devoid of trees and brush; if a forest adjoins the right of way it is assumed that the right of way is a part of the forest with a corresponding growth thereon. We approve this method as involving the minimum of conjecture.

The carrier asserts that in determining cost of reproduction new, conditions with respect to population, business capacity, productiveness, and property values in the territory served by the railroad shall be taken as they exist on valuation date, but that the historical construction of the property must be taken into consideration whenever a rational engineering program for reproduction would so warrant or require. In the case of clearing and grubbing an allowance for the work which was done in order to clear the right of way is contended for. The method followed by the bureau and approved by us in this case is asserted to be unjust for the reason that the valuation excludes any allowance for damages to crops, gardens, etc., which would be incurred by the carrier in securing its right of way and terminal lands under present conditions. Furthermore, it is alleged, nothing is included for the cost of removing the buildings which were in fact upon the land when acquired, or which, on the basis of present conditions, would be on the right of way or terminal lands on valuation date. In other words, it is claimed that we are inconsistent in ignoring present conditions in the case of damages to crops, for instance, and in considering present conditions in the case of clearing and grubbing.

While the carrier contends that the estimate in this respect is too small, the Minnesota commission is of the opinion that it is too great, and intimates that clearing and grubbing may be made a source of revenue. It points out that a unit cost of approximately \$29 per acre is applied for clearing and grubbing, against which

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there is no offset representing the sale value of the forest products removed. It is claimed "it would be a very lean acre, indeed, that would not yield twice this allowance or at least \$58 per acre in merchantable forest products." The record shows that these are lean acres.

As previously stated, we interpret the term "cost of reproduction new" literally, i. e., the cost of reproducing under present conditions the existing property of the carrier without computing depreciation. The amount of clearing and grubbing which was necessary in the original construction is reported in "original cost to date" when it can be obtained. There can be no doubt that the building of the railroad has added to the value of adjoining land. We are required to find the present value of lands in a carrier's right of way; and such present value is measured by the value of adjoining lands. It would therefore be improper to allow for clearing and grubbing originally done in addition to the benefit derived by the carrier from the increase in the value of adjoining lands.

If original conditions were to govern, data concerning the work done many years ago could not be obtained in many instances. Data concerning original conditions could probably be secured in the case of recently constructed railroads. The amount reported in the first case would be the result of speculation while in the latter it would be the statement of a fact.

Cost of reproduction new is at best an estimate, but as now reported by us is derived under the same general rules, and the estimates regarding different properties are comparable in all cases.

It will undoubtedly happen that in a theoretical reproduction of a railroad the right of way at present runs through valuable standing timber. If the assumption that the right of way is covered with the same growth in the same density is correct for the purpose of ascertaining the cost of reproduction of clearing and grubbing, it follows that an estimate should also be made of the amount of salable products which could be derived from such growth and the proceeds thereof at prices prevailing in the locality credited against the estimated cost of clearing and grubbing. No such offset is allowed in this case for the reason that the facts do not warrant it.

INDUSTRIAL TRACKS.

In the course of the development of the transportation systems as they exist in the United States to-day thousands of so-called industrial tracks have been constructed. These tracks connect the main tracks of carriers with particular industries. Over them incoming freight is delivered by the carrier to the industry, and outgoing

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freight is delivered by the industry to the carrier. Generally industrial tracks are used exclusively by the particular industry for whose benefit they were built, but in some instances industry tracks are also used by others. It is safe to say, however, that a large percentage of the traffic moved over industrial tracks is for the industry or industries located thereon and for whose benefit the tracks were originally constructed.

Industrial tracks have generally been constructed in accordance with contracts between the industry and the carrier, and the considerations of the contracts have varied greatly. In most instances the industry pays a portion of the entire expense of constructing the track, including the cost of the land and materials used.

We have defined an industrial track in Valuation Order No. 12 as a "track which the carrier has not an unrestricted right to use in serving the general public, but which it has obligated itself to use instead exclusively, or preferentially, in serving a particular industry or certain industries." In cost of reproduction new the inventory of the carrier includes such portions of an industry track as it would have a right to remove if it should discontinue the service, except that we always include in the carrier's inventory the estimated cost of reproducing any item of property in the industrial track which was in fact paid for by the carrier in original construction. In determining the portions of the track which the carrier would have a right to remove in case of reproduction if the service were discontinued, we assume that reproduction would take place under a contract identical with that covering original construction. Where the carrier has procured the right of way and constructed the track at its own expense, both are inventoried to it. If the industry constructed the track at its expense and owns it, nothing is allowed to the carrier in cost of reproduction new. Where the carrier and the industry have both contributed, which is the usual case, the carrier is credited with an amount covering the estimated cost of reproducing that which it did produce. If the industry has paid for the items of property making up the track, but has given the carrier the right by contract to remove the track, etc., credit is given to the carrier for the reproduction cost of such property. In the case of land nothing is allowed the carrier if the land is owned by the industry. When, however, the carrier does not own the land, grading and other permanent structures are inventoried as above described. In other words, the carrier is limited to its interest in the industrial track.

In the instant case, however, the carrier contends that any such treatment of industrial tracks is erroneous and in violation of the 75 I. C. C.

act. It contends that the act requires us to report the cost of reproduction new of "all the property owned or used," and, in the case of lands, the original cost and present value of "all lands, rights of way, and terminals owned or used." It is asserted that since the carrier unquestionably uses these industrial tracks it is our duty to include them in cost of reproduction new and report the present value of the land contained in the right of way. The matter of title to the land and tracks, it is claimed, can not be inquired into in view of the wording of the act.

Certainly such a figure would not be accepted by the carrier as an element to be considered in arriving at a value for taxation purposes, since the amount would embrace property which it did not own. The use of such a figure would be equally without justification for purchase purposes, for the reason that a carrier could not convey title to property which it used but did not own. The same objection would apply to the use of the figure for capitalization purposes. While for rate-making purposes it may be proper to consider the value of the property used, a figure reported in the manner contended for might include more property than was being used by the carrier whose rates were being adjusted, for the reason that the carrier might not be operating all of the property which it owned.

That the policy pursued by us regarding industrial tracks is entirely fair to the carrier can not be questioned. The carrier is not only credited with the amount of money which it is estimated would be the cost of reproducing that which it did produce, but in addition thereto is considered the owner of materials going into the tracks, even though such materials were paid for by the industry, when the right of removal on discontinuance of the service can be shown.

Our view that the cost of industrial tracks would not be paid for entirely by the carrier is certainly not inconsistent with the history of the construction of such tracks in the past. This being true the logical assumption, it would seem to us, in estimating cost of reproduction new, is that the industrial tracks would be constructed under the same conditions as now subsisting in the contractual relations between the carrier and the industries served by these tracks. That a carrier should not receive credit in cost of reproduction new for any part of its property which it would not be obliged to pay for is equitable. This doctrine has received approval in *Appleton Waterworks Co. v. R. R. Com. of Wis.*, 154 Wis., 121. This case involved an order of the Railroad Commission of Wisconsin, fixing the value of the property of the water company at \$255,000, and directing the city of Appleton to pay that amount to the water company as the purchase price of its plant. Among the elements considered by the Wisconsin commission in determining the value of the property were cost of

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reproduction new and present physical value, based on cost. As the first figure the commission reported \$252,091 and as the latter \$242,127. In arriving at cost of reproduction new the commission omitted an allowance for excavating and filling trenches in which to lay 252 service pipes. This omission was alleged as error and the case was appealed to the supreme court of Wisconsin. At the time the plant was taken over by the city of Appleton there were 1,827 service pipes attached to the mains. The water company had dug and refilled at its own expense 1,575 of the trenches containing the service pipes, while the expense with respect to the remaining 252 was borne by the patrons of the company in accordance with a rule of the company in force during the latter years of its existence requiring a prospective consumer to pay for the cost of digging and refilling service-pipe trenches. The court upheld the railroad commission in excluding the money expended by the patrons in digging and refilling the 252 trenches referred to and said:

Cost of reproduction must mean the cost which will be necessarily incurred by a reasonably prudent and careful man, using ordinarily careful business methods, in reproducing a plant of equal efficiency. Anything which, under such a conduct of the business, would cost nothing to reproduce can not logically be included.

To hold that a carrier is entitled to the full amount of the value of industrial tracks, when a part of the expense of original construction has, in fact, been borne by the industry, would be manifestly unfair.

Under these circumstances it can not be that the lawmaking power intended by the words "used by said carrier for its purposes as a common carrier" to include property not owned by the carrier where the use by it is only incidental and at the request and for the peculiar benefit of the owner. The mere movement of a locomotive of the carrier over the track of a private individual for the benefit of that individual at his request is not a use under the act. The industry track is *sui generis* and the act must be interpreted with reference to practical conditions in each case. The method followed as to such tracks in the tentative valuation is approved.

ASSESSMENTS FOR PUBLIC IMPROVEMENTS.

In account No. 39 of the classification of investment in road and equipment, the carrier is required to report the cost of constructing public improvements, such as grading, sewerage, curbing, guttering, paving, sidewalks, etc. This account also includes the cost of improvements when made by the carrier's employees under government requirements. The carrier in this proceeding has expended

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\$9,477.50 for assessments for public improvements as shown by charges to account No. 39, and claims that this amount should be included in cost of reproduction new. The amount expended is reported in original cost to date when such a figure can be ascertained. The principle announced concerning the treatment of "topographical conditions" in cost of reproduction new applies with equal force to this item; and, since the property of the carrier is presumed to be reproduced under present topographical and other present conditions, it will be seen that no assessments for public improvements would be incurred, and this item would therefore be improper. As assessments for public improvements can only be levied in proportion to benefits received by the lands assessed, the present value of lands adjacent, taken as the basis for the ascertainment of the value of railroad lands, reflects the public improvement assessments in question. It should be stated, however, that if a public improvement for which an assessment against a carrier has been made in the past is located on the right of way of the carrier, or so closely connected therewith that it would be wiped out if the railroad were removed, the estimated cost of reproducing it would be included in the valuation under the heading of cost of reproduction new.

PROPERTY USED BUT NOT OWNED.

In addition to the use of property owned, many common carriers have made arrangements by contracts for the use of property for common-carrier purposes which is owned by others. In instances where property is used individually by a carrier for common-carrier purposes and is owned by some party other than a common carrier the Commission includes the property in detail in the inventory of the using carrier. The inventory also includes a description of the ownership and of the use. Ordinarily where property is used by one carrier for common-carrier purposes and is owned by another carrier, the inventory of the owning carrier shows in detail the three cost values required by the act to be reported. The inventory also shows the terms of the use. The inventory of the carrier using such a piece of property shows the totals for the three cost values, and also sets forth the ownership and terms of the use. It sometimes happens that the details with respect to a property of this kind are reported in the inventory of the using carrier. This is true in instances where the whole property of a common carrier is operated by another common carrier and the records of the property are in the possession of the using carrier. Where private property is partially used by a carrier for common-carrier purposes, but it is impossible or impracticable to segregate such property and place

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a separate value upon it, we report the rental paid. In an instance of that kind the property itself is not included in any inventory made by us. Where property is owned by a common carrier and is used by it jointly with another carrier or carriers for common-carrier purposes, the property is included in detail in the inventory of the owning carrier and reference is made to the use by the other carrier or carriers. The extent and terms of the use appear also in the inventory of the using carrier or carriers.

It has been our endeavor to adopt a method with respect to this class of property which will permit of reporting the three cost values for all property used for common-carrier purposes without duplication. When it is borne in mind that many railroads are not operated exclusively by their owners, but that certain portions thereof are used by one or more carriers by virtue of trackage rights, etc., it is apparent that duplication of values for such jointly used property will result unless a proper course of procedure is pursued. The necessity of securing reproduction new and reproduction less depreciation values without duplication is manifest, since these values must necessarily be considered as factors entering into the determination of an ultimate value of railroad property.

In its protest the carrier makes no complaint concerning the property used exclusively by it, but insists that the procedure above outlined is erroneous to the extent that it results in omitting from the inventory the three cost values of property used but not owned by it and the value of its right to use such property.

As stated above, in instances where private property is used only partially by a carrier for common-carrier purposes the property does not appear in any inventory made by us. Items of this character are, as a rule, insignificant in amount. To attempt to ascertain the cost figures for property of this kind would entail the expenditure of a large amount of time and money entirely out of proportion to the benefits to be derived from the results which would be obtained. For example, in practically every large city in the country carriers have rented offices in public buildings for the sale of tickets, solicitation of traffic, etc. These buildings are owned by private business interests. The space occupied by the carrier devoted to common-carrier purposes is but a small part of the entire building. It can safely be assumed, we believe, that the act never contemplated an appraisal of property which is merely incidental to the common-carrier business. In instances of this kind we report the rental paid. Since under the accounting rules of the Commission the carrier is permitted to deduct rental paid from the revenue derived from operation, this method is as fair to the carrier as to the public. Of course if the amount of the rental

paid is more than the value of the use, the public will be injured to the extent of the amount in excess of a fair rental so far as the particular carrier is concerned, while, on the other hand, if the amount of the rental paid is less than the value of the use the public will be benefited to a corresponding extent.

And, further, the adoption of a rule requiring the inclusion in the inventory of every carrier of every piece of property used by it for common-carrier purposes would lead to absurd results. During certain periods of the year a large number of railroads are called upon to move the cars of circus companies. These cars are used by the transporting carrier for common-carrier purposes, but no one can seriously contend that the law contemplates the ascertainment of the cost values for such cars with credit therefor in the inventory of the using carrier. It follows that our practice with respect to partially used privately owned property is reasonable, and the results obtained thereunder are not in conflict with a correct interpretation of the act.

It has also been stated above that where property is owned by a common carrier and is used by it partially with another carrier or carriers for common-carrier purposes, such property is included in detail in the inventory of the owning carrier, and the use is described in that inventory and also in the inventory of the using carrier or carriers. This is a correct statement of the general rule, but the method pursued varies with the circumstances of the particular case.

In the case under consideration the carrier uses jointly with the owner that portion of the St. Louis Southwestern Railway of Texas, commonly known as the Cotton Belt, between Commerce, Tex., and Greenville, Tex., 13.97 miles in length, as a part of its main line. This portion of the Cotton Belt forms the connecting link between two pieces of track owned exclusively by the Texas Midland. Without it the carrier would be unable to perform through transportation service between points located north and south, respectively, of this particular portion of the Cotton Belt. The 13.97 miles has been considered as a single valuation section. It has been inventoried and priced by itself. Cost of reproduction new and cost of reproduction less depreciation for it will be stated separately. This detailed information will appear in the inventory of the Cotton Belt when completed, with a statement that this section is used by the Texas Midland, together with a description of the terms of the use. In the tentative valuation under consideration it is stated "the tracks of the St. Louis Southwestern Railway Company of Texas between Greenville and Commerce, a distance of 14 miles, are used under a trackage arrangement to unite the two pieces of the Texas Midland * * *," so that if it becomes essential it will be possible at any time to refer

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to the inventory of the Cotton Belt and ascertain the cost values for that particular piece of property.

The allegation has been made that as a result of this practice the valuation which has been served in this proceeding is incomplete, for the reason that the valuation of the Cotton Belt has not been made public, and therefore the cost values of this 13.97 miles used by the Texas Midland are not included in any records available to the public. If the wishes of the carrier in this regard were to be followed, we would be unable to announce the valuation of any railroad which uses property for common-carrier purposes owned by another carrier or carriers until such time as the valuation of the other carrier or carriers is completed. This would seriously embarrass the valuation work and could not result in any benefit to the public. We would not be justified, therefore, in delaying the service of the tentative valuation of a particular carrier until the completion of the valuations of other carriers which would include detailed figures with respect to property used but not owned by that carrier.

There is, however, a considerable amount of jointly used property which will not be separately inventoried and for which detailed figures will not be reported separately. Detailed information of this kind could only be secured after the expenditure of a large amount of time and money, and it is felt that the results obtained would not be commensurate with such expenditures. Certain classes of trackage rights are illustrative. Many instances have been found where a carrier secures the right to use the tracks of other carriers for common-carrier purposes for distances ranging from 0.01 of a mile upward. Sometimes the right to use these tracks is only occasional. The restricted right to use these tracks is merely incidental. The tracks over which such inconsequential and incidental rights of use are granted are inventoried as a part of the property of the owner; reference is made in that inventory to the use and also in the inventory of the using carrier or carriers, so that the statute will be literally complied with, because every piece of railroad property which is owned or used for common-carrier purposes will be inventoried.

In addition to its claim that the three cost values of the property used but not owned should be included in its inventory, the carrier asserts that it is our duty to report separately a figure as the value of the right to use. It is a sufficient answer to this contention to state it is now universally accepted that it is the fair value of the property used by the public service corporation in serving the public which is to govern in fixing rates. *San Diego Land Co. v. National City*, 174 U. S., 739. This being true, the value of that property can not be increased or diminished by contracts or other arrangements between

the carriers themselves. In the absence of an improper payment as rental the public is not concerned with the acts of carriers between themselves. The law requires the ascertainment of values for property owned or used, but not the value of the use.

The attempt to fix the value of use would be speculative, because of the absence of any sound basis upon which to proceed, and if obtained would result in the inflation of the property values of the carriers upon which the public may be required to pay a fair return. Indeed, such a finding by us would have the effect of inviting the carriers to make arrangements between themselves with the view of increasing the value of their property.

It should be further noted that if the carrier is correct in its claim that the right of joint use may be of more value than the rental paid and that therefore the Commission should appraise this right, and we do not intend to intimate that this can be so, still in such event the carrier should make its claim and introduce its evidence showing the value of the use to the end that an intelligent finding might be had. The mere putting of the property into the inventory would signify nothing and would only result in duplication.

When the valuation work has been completed for all the railroads in the United States, the Commission, the Congress, and the public will be informed with respect to every piece of property used in serving the public, with the single exception of that insignificant portion which is privately owned and partially used by common carriers. The inventories of the individual carriers will contain the cost values in detail with respect to property owned; the cost values in detail for property exclusively used by them but owned by a non-carrier; total cost values for property exclusively used by them but owned by a common carrier; a description of the terms and use of jointly used property of others with a reference to the report of the owning carrier for details in regard thereto; and a description of the terms and use of jointly used property owned by them with a reference to the reports of the using carrier or carriers for details in regard thereto. All the property used in serving the public will be inventoried and valued, and will be inventoried and valued once and only once. There will be and should be no duplications.

It follows that the method adopted is approved.

CONTINGENCIES.

In the estimate of cost of reproduction new we have not allowed any amount under the head of "Contingencies," and this omission is assigned as error by the carrier.

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When the construction of a railroad is under consideration it is customary for an engineer to estimate the amount of money it will be necessary to expend in building the property. Experience has shown that it is practically impossible, no matter how carefully such an estimate may have been made, to include all the items of expense which will be incurred in the work of construction. Additional expense is caused by omissions and unforeseen difficulties in the work of construction. Necessary materials are sometimes omitted. From soundings a cut may appear to be made up entirely of earth and the estimate for excavating and digging is based upon this expectation. However, when the work is performed it is found that it contains a large boulder which it is necessary to cut through or entirely remove. This unforeseen condition lengthens the time allowed for construction and correspondingly increases the expense. Frequently quicksand is found where solid earth was expected. Numerous other instances of unforeseen difficulties could be cited which occur and which add to the total cost of the work. In order to provide for expenses of this kind the practice of including a certain sum for contingencies in estimates of the prospective cost of construction has been quite generally adopted.

The carrier contends that in a theoretical reproduction of the property these same omissions will be made and unforeseen difficulties will be encountered, and in order to secure a figure fairly representative of reproduction cost an estimate for contingencies as such must be made.

In our view the theoretical reproduction of a railroad, such as is assumed in valuation work, is materially different from the original construction and does not justify an allowance for contingencies as such. In theoretical reproduction the property to be constructed by the engineer is before his eyes. The topography of the country through which the right of way runs can be observed. He knows the natural difficulties which will have to be overcome. If rock is found, his estimate is based upon cutting through or removing that rock. The exact amount of materials above the roadbed is capable of ascertainment, and no addition should be made for materials omitted. However, with respect to certain materials the carrier is not limited to the amount necessary to duplicate what is actually in the property. This is illustrated by the item of spikes. It is recognized that in laying rail a certain percentage above the number of spikes required is purchased to take care of losses and imperfections, and an allowance to cover these possibilities is made. It is recognized, of course, that in compiling the inventory of the roadway there are certain quantities which are hidden and can not be observed.

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In estimating hidden quantities the representatives of the Commission rely upon the statements of the carriers supplemented by such records as they may possess, tested by the observations of our engineers. These statements and records are accepted unless they appear to be erroneous on their face. Field notes of the Commission containing the estimate of the quantities to be allowed are furnished the carrier if desired, and if objected to the matter is thoroughly investigated. In the application of prices to the items embraced in the inventory, we endeavor to compensate for all expenses which will be met in connection with a particular item. The item of grading furnishes a good illustration. We ascertain the price per cubic yard which is proper to apply for grading, and its determination in this regard is guided by prices paid under contracts for work of this character. However, it is recognized that certain work is performed by the grading contractor which is not included in his contract price, such as erecting temporary bridges, constructing ditches off the right of way, etc. To the price per cubic yard which is obtained in the manner indicated above is added an estimated amount to cover the additional expense. A similar addition is made in other cases when necessary.

The statement that no provision for contingencies has been made by us in this proceeding is therefore incorrect. The figure reported as cost of reproduction new is an estimate of the amount of money necessary to reproduce the identical property under valuation. The inventory is made with great care and the prices applied are arrived at after exhaustive study. Every necessary expense is taken into consideration.

Since reproduction new is at best an estimate, it is apparent that an estimate arrived at upon a basis as outlined above is as liable to be too high as too low and that therefore there is no warrant for the addition of a definite amount to cover contingencies, but that any allowance of that kind which ought to be made should be and is taken care of in connection with particular items of property.

ENGINEERING.

In the tentative valuation under consideration we allowed for engineering approximately 2.15 per cent of the amount shown as cost of reproduction new of the road accounts, exclusive of land and engineering itself. The carrier contends that this amount is not sufficient and that between 4 and 5 per cent should be provided. It has also been contended by certain carriers that it is not correct to allot a gross sum for engineering, but that engineering should be assigned to particular pieces of property. The matter of the suffi-

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ciency or insufficiency of the sum included will be dealt with in a subsequent portion of this report in connection with unit prices.

In securing cost of reproduction new an estimate for engineering has always been made. To ascertain the amount two methods have generally been employed, known as the synthetical and the historical.

By the synthetical method an estimate is made of the amount of engineering service which will be required and its cost. A construction program is mapped out; the number of engineers required is determined; their grade and salaries are fixed; the length of their service is stated and in this way the total amount of the expenditure is arrived at. The objection to this method is that no supporting data can be found. Reliance must be placed entirely upon the judgment of the engineer making the estimate and it is impossible to test that judgment by experience as disclosed by the records of the carriers.

The historical method inquires into what the expense for engineering has been in the past and seeks to determine in this manner what the expense would be to-day.

Since the accounting rules of the Commission have been in effect, engineering has stood as account No. 1 in expenditures for road and equipment and it has not been difficult to distinguish the items which should go into this account. The cost of engineering can, therefore, be ascertained with substantial accuracy as to many railroad properties. In estimating the cost of new work it has been customary to add a percentage of the total estimated cost to cover engineering, and in reproduction new the Commission has adopted the percentage method based upon charges to this account in the past.

The investment in road and equipment account is divided into three classes—road, equipment, and general expenditures. Engineering, of course, has no connection with the general expenditure accounts. While in some instances there is some slight engineering cost properly assignable to equipment, the amount is negligible. An expense of this character is incurred when equipment is ordered according to specifications prepared by the carrier. The elimination of equipment and general expenditures accounts in arriving at the amount to be estimated for engineering leaves for consideration the road accounts. It is clear that engineering itself should be excluded and the same is true of land, since there is no engineering cost in connection with this item not reflected and ordinarily included in the enhanced value of contiguous land. See *Minnesota Rate Cases, supra*, at page 450. Hence, we conclude that engineering should be computed on the amount estimated for the various road accounts, exclusive of engineering and land, and this basis has been adopted.

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In order to ascertain the proper percentage to apply the bureau made a study of the accounts of different construction projects. This study embraced 121 projects in different sections of the country ranging from $2\frac{1}{2}$ miles to 900 miles in length. The total number of miles of construction was 9,617, the cost of which was \$302,000,000. The amount found charged to engineering varied from 0.837 per cent to 9.732 per cent of the total amount shown as investment in road excluding land. In 6 instances the percentage for engineering exceeded 6 per cent; in 10 instances it was between 5 and 6 per cent; in 4 instances it was below 1 per cent, and in 16 instances between 1 and 2 per cent. In the balance of instances, 85, it ranged from 2 to 5 per cent. The weighted average showed approximately 3.6 per cent.

In view of this study our engineers were instructed to include for engineering an amount which should not be less than 2 per cent nor more than 5 per cent of the investment in road, exclusive of engineering and land. Should a member of the engineering board believe that there are peculiar circumstances which justify the application of a lower or a higher percentage, he is instructed to bring the case to the attention of the bureau.

In the instant case the estimate was first made by the synthetical method and the figure which was used was reached. When the instructions referred to above were issued it was concluded that this figure represented a sufficient amount, and it was allowed to stand.

The tentative valuation includes a sum of \$9,200 for "location engineering for a period of four months, at an average expense per month of \$2,300." The propriety of this inclusion is questioned by the valuation committee of the National Association of Railway and Utilities Commissioners, for the reason that it represents reconnaissance, an obvious conjectural expense incurred in supposititious groping through the country for locations which are not used. Such an expense, it is argued, should not be included in the reproduction cost of a railroad, the exact location of which is known. In the construction of a new railroad it is necessary to reconnoiter, lay out lines, and engage in considerable preliminary work in order to secure the most advantageous route. Such a program is not necessary in a theoretical reproduction of a property under valuation. The inclusion of an amount to cover expenses of this character is incorrect. Cost of reproduction new is the cost of reproducing the existing line of railroad. For reasons just stated it is obvious that the figures reported as engineering in the study made by our accountants embrace expenses incident to the reconnoitering and laying of preliminary lines. However, it has been impossible to segregate these expenses, which are necessary in original construction but unnecessary in re-

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production, and no deduction has been made on this account in the instant case. It is believed, therefore, that the application of a percentage within the limits prescribed will do full justice.

The percentage method as explained above is approved.

GENERAL EXPENDITURES.

Items 71 to 77 of the classification of investment in road and equipment of steam roads are termed "general expenditures." The basis upon which to estimate the amount to be included for these items in the cost of reproduction new will be here considered. Item No. 76 is "interest during construction" which will be treated in a subsequent portion of this report. The accounts here involved are as follows:

- 71. Organization expenses.
- 72. General officers and clerks.
- 73. Law.
- 74. Stationery and printing.
- 75. Taxes.
- 77. Other expenditures—general.

In the tentative valuation under consideration the member of the engineering board stated a certain amount for each of these accounts. In Account No. 71 was embraced a charter fee assessed under Texas laws and incidental expenses; in Account No. 72 an estimate for general officers and clerks and expenses; in Account No. 73 a provision for what were considered to be necessary legal expenses; in Account No. 74 an allowance for stationery and printing; in Account No. 75 an amount equal to one-quarter of the total amount of taxes paid by the carrier during the year 1914. In Account No. 77 no sum was stated.

This method of estimating the amount of money which might properly be charged to these accounts was not satisfactory to the bureau. It was felt that a more appropriate basis would be to ascertain what had been charged in the past and adopt a percentage basis to determine the sum to be estimated in reproduction. With this in view our accountants made a study similar to that undertaken in connection with engineering and covering the same list of carriers. The percentage of general expenditures other than interest to all road accounts, excluding land for the different valuation districts, was as follows:

	Per cent.
Eastern.....	1. 766
Southern.....	2. 251
Central.....	1. 362
Western.....	. 838
Pacific.....	4. 086
Average.....	1. 930

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As stated the roads selected were the same as those included in the engineering study and embraced many different types, some of recent construction and others which have been in existence for many years. In a number of cases it was necessary to accept the figures as shown in the carriers' books without being able to test their accuracy.

The percentage for the western district is too low and is accounted for by the fact that many of the properties considered were constructed by parent companies. A considerable part of the office work was actually done by the parent organizations, and the expenses incident thereto were not included in the accounts of the carrier under construction. On the other hand, the percentage for the Pacific district is abnormally high, due to the fact that the construction period of the Western Pacific, one of the roads included in the study, was extremely long, about seven years. Because of its mileage and capital expenditures that road dominates the weighted average. It was thought desirable, therefore, to make an examination of individual properties where the circumstances of construction were fully known. The carriers referred to the Virginian Railroad as being such a property, and the bureau agrees that it is illustrative, because it is a high-grade road and ample time was taken to construct and equip it before operations began. The percentage in this case was found to be 1.889. The Winston-Salem Southbound is another property as to which we have satisfactory information, and the percentage shown for it was 1.271. This percentage, it is contended, is too low because a certain part of the general expenditures was alleged to have been borne by the Norfolk & Western and the Atlantic Coast Line railroads, which companies furnished the money and are owners of the road.

After careful deliberation, the bureau concluded that $1\frac{1}{2}$ per cent of the amount of all road accounts, exclusive of land, would be a fair estimate for general expenditures in the case of all roads. Where, however, more than a nominal charter fee has been required, the engineers have been instructed to ascertain the amount of such fee and add it to the $1\frac{1}{2}$ per cent.

The carrier contends that this percentage is too small, and that the particular group of roads selected by the accountants is not representative. It calls attention to six other roads which might have been selected, for which the average would have been between 4 and 7 per cent. In answer to this it is sufficient to state that no one knew, when the properties included in the study were selected, what the figures would show, and no attempt was made to support any preconceived theory, the sole desire being to ascertain the fact, and it is believed that the results obtained are fairly representative.

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From what has been stated we are of the opinion that an estimate of $1\frac{1}{2}$ per cent on all road accounts except land for general expenditures will do full justice to the carrier.

COST OF OBTAINING MONEY.

Money with which to construct a railroad is usually obtained by the sale of stocks and bonds. Sometimes the money is at first borrowed on short term paper and the bonds are issued and sold at the end of the construction period. The bonds may be issued before the beginning of construction and held as collateral for the short-term paper, or the bonds may be sold in advance of construction. The latter method has seldom been followed. Both methods involve expense. Short-term paper carries with it a certain charge for brokerage, generally not exceeding one-half per cent, while the sale of bonds involves a discount which includes brokerage, dependent upon the rate of interest, the length of the term, and the credit of the company.

During the early stages of our valuation work an endeavor was made to determine the cost to a carrier under valuation of obtaining money; that is to say, to ascertain the credit of the particular company and the circumstances which would surround its financing. It seemed necessary, however, to abandon this method because it was found to be an almost impossible task, and the result was misleading. The bureau has therefore assumed for this purpose that the reconstruction would be done by a company the credit of which was good and which could purchase supplies at advantageous prices. This policy having been adopted, it was necessary to determine the rate of interest. Since a railroad with good credit has no difficulty during normal times in borrowing money at $4\frac{1}{2}$ per cent, it was felt that the rate of 6 per cent would be ample to cover all incidental items of expense in connection therewith.

The carrier objects to this method and states that the assumption that its credit is good enough to enable it to borrow money to build its railroad upon a 6 per cent basis is without foundation in fact, but that should an assumption such as above indicated be correct, 6 per cent is too low to cover the entire cost, which would include commissions, syndicating, and other expenses. Eight per cent is suggested as proper in the present case.

There are undoubtedly instances where it will be found that should the carriers be left entirely to their own resources they probably could not borrow money at any rate of interest in a sufficient amount to cover the entire cost of construction. Assuming that reconstruction would be done by a company the credit of which was good, the cost of reproducing properties on the basis here assumed will be fairly comparable in all cases.

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CONSTRUCTION PERIOD.

The time allowed for the construction period in cost of reproduction new is important in its relation to the amount to be allowed for interest during construction. From our examination of the records of construction in the past, it is fair to state that, so far as the expenditure of money is concerned, the construction of a railroad is properly divided into two parts—the preliminary period before the construction begins, and the period of construction itself. The first period is the time within which preliminary and location surveys are being made, and in the past its length has varied from two or three months to several years. Arrangements for securing money, rights of way, and for letting of contracts are generally consummated during this period. During this preliminary work the expenditures are necessarily small in comparison with the expenditures during the period of construction. The period when the bulk of the money is expended is that during which construction takes place.

When the valuation work was first undertaken an attempt was made to estimate the preliminary period. The records of the roads selected were so different in this respect that no satisfactory rule could be developed. In view of this and of the further fact that expenditures are small during this time it was decided to state the period required for construction only.

The construction period, as determined by our engineers, does not represent the shortest period in which the railroad could be constructed, but rather that period within which the work might be economically done. The usual delays which occur in normal times, due to labor and market conditions, are assumed to exist, but unusual delays, due to financial troubles and other causes peculiar to individual properties, are eliminated.

All existing means of transportation, aside from the property itself which is under reproduction, are assumed to exist. The carrier in this proceeding is crossed by several different roads and these roads are used theoretically to bring in men and materials to junction points. This enables the engineer to proceed with the hypothetical reproduction at several different places at the same time. This assumption often reduces the period allowed for reproduction materially below that which was required for the building of the property, but since the circumstances and conditions surrounding reproduction are entirely different from original construction, this method is believed to be fair.

INTEREST DURING CONSTRUCTION.

The rate of 6 per cent interest having been approved, it remains to consider the length of time for which this rate should be applied.

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Interest for one-half of the construction period has been generally allowed in the valuation of public utilities. Since, however, in determining the construction period in the instant case no time has been considered for preliminary work as such, the question arises whether or not one-half of the construction period is sufficient. It is assumed by us that a railroad company would have a sufficient amount of money on hand at the beginning of each six months to cover construction expenditures for that period. A study of the active construction of certain roads shows that when expenditures begin they continue at about an even rate to the end of the construction period; that is, for the total number of months during which construction continues, the outgo per month is about uniform. Therefore, if the assumption that the money required for each six months is on hand at the beginning of that six months is reasonable, and we find that it is, the time for which interest should be allowed is one-half the construction period plus three months, which will be ample to cover the relatively small amount of money which is expended prior to construction. This is the method which has been adopted by the bureau, and interest is computed upon the total amount of the road and general expenditures accounts with the exception of land and interest during construction.

A considerable part of the cost of a railroad is in its equipment. While it is true that as a general rule equipment is not purchased until the road is practically completed, and but little interest is paid on money expended for equipment before operation begins, nevertheless it is necessary to have the equipment some little time prior thereto. For this reason some provision for interest should be made. It is believed that an allowance of three months on the money expended for equipment is equitable. This rule has been adopted.

It is further claimed that at least two-thirds of the construction period should be taken as the basis for the computing of interest. The facts of record do not show that the time allowed for interest during construction is too short and the rule announced above is approved.

The carrier claims that the method is unjust for the reason that the cost of reproduction must include the present cost of acquisition of lands and that therefore interest must be included thereon. Since the payments for land are a substantial part of the money necessarily expended in building a railroad, the figure which has been reported by us for interest during construction is claimed to be too low. Our view with respect to matters concerning land will be treated in a subsequent portion of this report.

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MATERIALS AND SUPPLIES AND OTHER WORKING CAPITAL.

The property of a railroad which is necessary in operation may be divided into two general classes—the plant itself and its operating assets. By the plant is meant the roadway, equipment, and other physical parts. Operating assets include materials and supplies and cash on hand.

In the accounting report which accompanied the tentative valuation and made a part thereof is an inventory of the materials and supplies on hand as of June 30, 1914. The records of the carrier show an investment of \$82,943.24 in materials and supplies, while the inventory prepared by the bureau, at prices obtained from invoices rendered the carrier, shows a value of \$96,857.19. No attempt has been made to ascertain depreciation with respect to materials and supplies. In all cases of new property the cost figure was applied, while for secondhand property an effort was made to apply a fair secondhand price. It should be stated, however, that there was a comparatively small amount of secondhand property. The final valuation hereafter set out also contains a comparative general balance sheet which includes the following under current assets:

Cash.....	\$13,908.16
Net balance receivable from agents and conductors.....	4,324.08
Miscellaneous accounts receivable.....	16,395.34
Materials and supplies.....	82,943.24
Total	117,570.77

The carrier contends that we have erred in not including materials and supplies in the three cost values. The suggestion is made that cash items should also be included and taken at par.

In cost of reproduction new, however, the property to be theoretically reproduced is the railroad itself. It does not contemplate the inclusion of materials and supplies and cash on hand, which are so-called liquid assets, and change from day to day. The accounting report, which is a part of the tentative valuation, contains full information with respect to these items as of the valuation date. The method pursued is a compliance with the act.

SECONDHAND MATERIALS.

Where secondhand materials were installed and still exist, the bureau has interpreted cost of reproduction new to mean the cost of reproducing the materials in the same condition in which they were installed. The carrier alleges that this interpretation of the word "new" is incorrect, and that market prices on valuation date for new materials of the same kind should be ap-

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plied to such units. The question of secondhand materials enters into the valuation of the carrier in this proceeding in Account No. 6, bridges, trestles, and culverts; Account No. 9, rails; and Account No. 57, work equipment. When secondhand materials are used in theoretical reproduction depreciation is figured upon the basis of the cost of the materials new. Secondhand materials have been used in original construction by a great many railroads, and the basis which shall be adopted for estimating the reproduction cost of such materials is therefore important.

A typical illustration of secondhand materials is the logging road. In many cases such roads have been built entirely with materials which have seen previous service. The rail and equipment, for instance, may be larger and more expensive than the road would have been justified in buying if it had bought them new. Because, however, such materials would serve the purposes for which the road was built and could be secured at prices considerably below the market prices for new material of the same kind they were secured. A strict interpretation of the word "new" in estimating the cost of reproduction new of a property of that kind would require the substitution of new materials for materials which are known to have been secondhand when the road was "new" or first built. We do not think that the act requires or contemplates this. The property to be reproduced is the existing property as it was when it was put into its present service. When the records of the carrier clearly show that secondhand materials were used the cost of reproduction new will be estimated for the same kind of materials in the same condition as when installed.

QUANTITIES AND UNIT PRICES.

Before considering the differences which exist between the figures contained in the tentative valuation and those claimed by the carrier, it will be well to state briefly the practice of the bureau with respect to the application of unit prices.

Under date of February 9, 1915, the Commission issued its Valuation Order No. 14, known as "Order, instructions, and forms pertaining to purchases of materials, prices paid, and rates of compensation paid for labor." With respect to materials, this order required every carrier whose property was to be valued to file with us a statement of the two largest purchases of each class of material for each calendar year from 1910 to 1914, inclusive, together with net prices paid. In the event that two purchases per year had not been made, a statement of such purchases as might have been made was required.

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Information with respect to certain materials for the period from 1905 to 1914, inclusive, and as many as four purchases per year were in some instances required. The statement required, among other things, information as to the purpose for which the material was used, the name of the maker, the maker's catalogue number or reference, name of the party from whom purchased, and the amount of freight charges actually paid. With respect to labor, the carrier was required to report the rates of compensation paid on each of its separate divisions for each calendar year, 1910 to 1914, to all classes of employees. The rate of compensation was defined to be the usual and ordinary rate paid for the particular occupation, and required the rate for each year to be obtained by taking the governing rate on the first day of January, April, July, and October of each year and dividing the aggregate by four.

We are required to report to the Congress the cost values with respect to completed properties, and the cost of assembling must be shown in addition to the cost of materials and labor. In order to ascertain what had been expended in the past, the carriers were required to file a statement of all completed projects for which information could be furnished. After these statements were received, certain of the projects therein contained were selected and completion reports were required to be filed. In addition to this information, an accountant has been detailed in each district to bring together cost data under the direction of the district engineer.

The complement of each valuation district has, in addition to the district engineer, a corps of experienced engineers. These men have had practical experience in railroad construction in the past and are conversant with every phase of the problem. The sole purpose of these men is to apply prices to the units of property set forth in the inventory which will do justice to all concerned. These men study the cost data which have been received from carriers and exercise their judgment as to the prices to be allowed in a theoretical reproduction of the property under valuation. The cost data which are before the engineers are not controlling, but are applied with reference to the particular property the details with respect to which are well known by observation to the engineers.

The use of cost data obtained in this manner is believed to be entirely reliable since it is based upon experiences of production of railroads under similar circumstances in the past.

There is given below a table which sets forth the figures contained in the tentative valuation as cost of reproduction new for certain

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items of the road and equipment accounts, other than lands, together with the claim of the carrier respecting those items.

Acct.	Classes.	Tentative valuation.	Claim of carrier.
I. ROAD.			
1	Engineering.....	\$54,926	\$126,700
3	Grading.....	411,866	539,545
6	Bridges, trestles, and culverts.....	387,792	532,222
8	Ties.....	272,688	280,950
9	Rails.....	525,134	538,183
11	Ballast.....	210,637	287,697
12	Tracklaying and surfacing.....	207,502	268,319
15	Crossings and signs.....	29,565	30,451
26	Telegraph and telephone lines.....	130	8,857
39	Assessment for public improvements.....		9,477
II. EQUIPMENT.			
55	Motor equipment of cars.....	57,020	57,780
57	Work equipment.....	73,236	75,736
III. GENERAL EXPENDITURES.			
71	Organization expenditures.....	831	51,100
72	General officers and clerks.....	15,000	65,550
73	Law.....	9,100	18,000
75	Taxes.....	5,971	12,000
76	Interest during construction.....	144,691	264,487
	Total.....	2,406,089	3,167,054
	Contingencies.....		149,838
	Appreciation.....		61,000
	Grand total.....	2,406,089	3,377,892

Engineering is the first item with respect to which the carrier makes a claim for an additional allowance, but in view of the fact that the amount to be set aside for this item is computed upon a percentage basis of the total amount of certain accounts, it will be considered later.

Account No. 3, grading.—The tentative valuation has fixed \$411,866 under this head as the cost of reproduction new for property wholly owned and used, while the carrier claims \$539,545. The amount set forth in the tentative valuation is made up as follows:

Clearing 353.63 acres, at \$25 per acre.....	\$8,841
Grubbing 41.72 acres, at \$40 per acre.....	1,709
Earth excavation, 662,673 cubic yards, at 15 cents per cubic yard.....	99,401
Embankment, 1,686,817 cubic yards plus 168,682 cubic yards, 10 per cent for shrinkage, at 13.5 cents per cubic yard.....	250,492
Solid rock formation, 17,544 cubic yards, at 65 cents per cubic yard....	11,404
Loose rock excavation, 1,473 cubic yards, at 35 cents per cubic yard....	516
Hardpan excavation, 158,092 cubic yards, at 24 cents per cubic yard....	37,942
Riprap, 1,054 cubic yards, at \$1.50 per cubic yard.....	1,581
Total.....	411,886

Valuation sections 2, 3, 4, and 5 cover property which is jointly owned by the carrier with another carrier or carriers, and an estimate I. C. C.

mate for grading in these sections has been made to the extent of \$2,692, made up as follows:

Earth excavation, 1,543 cubic yards, at 15 cents per cubic yard.....	\$231
Embankment, 16,567 cubic yards plus 1,657 cubic yards, 10 per cent for shrinkage, at 13.5 cents per cubic yard.....	2, 461
Total	2, 692

The total cost of reproduction new in Table No. 1 exceeds by \$20 the amount contained in the tentative valuation, which is accounted for by an error in addition in valuation section No. 6. This correction will be made.

The carrier contends that the unit prices allowed are too low. Below are given the prices which the carrier in its protest claims should be fixed:

Clearing.....	per acre..	\$35. 00
Grubbing.....	do.....	52. 00
Earth excavation.....	per cubic yard..	. 18
Embankment.....	do.....	. 18
Loose rock.....	do.....	. 43
Solid rock.....	do.....	. 97

The carrier introduced testimony purporting to show that the clearing necessary in a theoretical reproduction would cost \$40 an acre and grubbing \$45 an acre. The manager of the carrier testified that he thought \$27.50 to \$30 per acre would cover the cost of clearing and \$35 to \$40 per acre the cost of grubbing. The claim for \$52 per acre for grubbing was withdrawn and the \$40 per acre unit price in the tentative valuation for this item is agreed to. There is no dispute as to quantities other than results from the application of present as compared with original topographical conditions, which we have already discussed and determined in this report.

The \$25 per acre for clearing was arrived at after the consideration of contracts for work of this character which had been performed in the vicinity and nothing has been submitted in this record to show that it is unreasonably low. In fact the opinion of the manager of the carrier, who has been with the property since it was built, that \$27.50 to \$30 should be allowed, may be said to support the price used when it is borne in mind that his testimony was opinion testimony unsupported by prices actually paid for similar work, and that his interest in the property might naturally influence his opinion so as to secure an amount which would beyond question fully recompense the carrier. The reasonableness of the unit price of \$25 per acre for clearing is established.

The claim of the carrier with respect to certain other items under this head has been modified to the following basis:

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	Cents.
Loose rock-----per cubic yard--	38
Solid rock-----do-----	80
Hardpan-----do-----	35

In estimating the price to be paid for earth excavation and earth embankment one of two bases may be used, the one-way basis or the two-way basis. When the one-way basis is adopted the price is estimated per cubic yard for the amount of material which is to be taken out of the cut. A certain limit of distance beyond which a contractor will not be expected to haul the excavated material is fixed, usually 500 feet. If it is necessary to transport the material beyond the free-haul distance the contractor is paid an additional amount per cubic yard for such haulage. The amount of earth contained in the embankment is not measured or paid for under the one-way basis. Under the two-way basis the amount of earth taken from the cut is measured and paid for; likewise the amount of earth in the fill is measured and paid for. Generally the question of the haul of the excavated material plays no part in the determination of the price to be paid under this method.

In the instant case the two-way method has been adopted. The prices which have been allowed for excavation and embankment were fixed by the engineer as the result of a study of 42 contracts for similar work in the same general section of the country. These contracts were executed during the period 1896 to 1912. The prices therein were quoted on the one-way basis and the two-way basis, but in the majority of instances the two-way basis was used, the price paid ranging from 9 to 19 cents per cubic yard.

The testimony of the carrier was submitted by three contractors and three railroad engineers. The testimony of all these witnesses was practically the same to the effect that from 17 cents to 19 cents per cubic yard would be a fair price for the earth excavation and embankment necessary in a theoretical reproduction of the road. The testimony was confined to expressions of opinion as to the proper price, and was practically unsupported, although one engineer submitted figures showing the cost of work in changing the alignment and grade of a railroad already constructed. It is well understood that grading of this character is generally more expensive than in original construction, and the figures in this instance have little evidential value.

Another observation should be made. It has been the contention of the carrier that a great part of the earth in its right of way is what is known as "black waxy." Earth of this character is extremely difficult to handle in any kind of weather. During a wet period it is sticky and in dry weather it solidifies. This kind of earth

is easily recognized, and the record establishes the fact that not more than 30 per cent of the right of way is in fact "black waxy." It is fair to assume, therefore, that the witnesses for the carrier based their estimates upon the assumption that the major part of the soil which would be encountered in a reproduction of the road would be "black waxy," and since that is not a fact their estimated prices are undoubtedly too high. There is nothing of record which would justify a change in the price of 15 cents per cubic yard for excavation.

For earth embankment, a price of $13\frac{1}{2}$ cents per cubic yard has been fixed. The contention is made that there is no warrant for a difference in price for excavation and embankment. When the field work in this case was completed, our engineer reached a price of 15 cents for embankment. The quantity to which this price was applied was limited to the exact measurements of embankments. It is well known that in order to make an embankment of specified dimensions, it is necessary to place in that embankment a certain amount of additional earth for shrinkage. In the territory through which this road runs, it has been customary for the contractor to quote his price upon the basis of the size of the embankment desired and to place a sufficient quantity of earth in the embankment to produce it. In this way the extra amount of earth which must be furnished to take care of shrinkage is given consideration in the price. This method was followed in the instant case. However, after conference between officials of the bureau, it was decided that the best way to treat this matter was to compensate for shrinkage in the quantities. This procedure contemplates the addition of a certain amount to the quantities which are found in the embankment after measurement. Ten per cent was arrived at, as a proper percentage to allow for such shrinkage. After it was decided to adopt this method it was necessary, in order to avoid duplication, to reduce the price applied by 10 per cent. This resulted in a price of $13\frac{1}{2}$ cents per cubic yard for embankment as compared with 15 cents per cubic yard for excavation. It will be noted that under the two methods of compensating for shrinkage, the amount arrived at is substantially the same. From the facts of record we are of the opinion that the price of $13\frac{1}{2}$ cents per cubic yard employed for the exact quantities found in embankments, increased by 10 per cent to take care of shrinkage, will do full justice.

The same character of evidence was introduced by the carrier with respect to loose-rock excavation, solid-rock formation, and hardpan. There is nothing of record, however, which would warrant a change in the prices found.

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The cost of reproduction new of grading, as set forth in the tentative valuation, is approved.

Account No. 6, bridges, trestles, and culverts.—The tentative valuation shows as the cost of reproduction new \$387,792 for bridges, trestles, and culverts wholly owned and used, and the carrier claims \$532,222. The items concerning which there is dispute are pile and timber trestles, bois d'arc piles, treated pine piling, untreated long-leaf pine piles, untreated pine caps, bois d'arc caps, untreated pine stringers, untreated pine guard rails, and secondhand dump planks.

An exhibit was introduced by the carrier to show that the prices used by our engineers for the materials named above, with the exception of bois d'arc piles and caps, are too low. This exhibit was based upon prices claimed to have been paid by the Atchison, Topeka & Santa Fe Railway Company for similar work. In this connection it should be stated that the prices applied by the bureau of valuation, under this account, were arrived at after consideration of returns made in compliance with Valuation Order No. 14 heretofore referred to, and the Santa Fe project, concerning which the exhibit referred to above was filed, was considered by the bureau. The carrier introduced evidence to show that the return under Valuation Order No. 14, for this particular piece of work, was made in haste and the prices contained therein were not correct, and that the basis contained in the exhibit introduced at the hearing should be substituted therefor. It should be further stated, however, that the return referred to was sworn to at the time of its submission. From a careful review of the evidence we are of the opinion and find that the prices adopted by the bureau will do full justice.

With reference to the bois d'arc piles and caps considerable testimony was introduced to show that the supply of bois d'arc is exhausted, at least so far as the larger sizes are concerned. Our engineer in charge of the valuation work with respect to this carrier is of the opinion, however, that sufficient bois d'arc to reproduce the property of the carrier in kind could be obtained in eastern Texas. It was also testified by the carrier that some of the bois d'arc in place upon the line of the carrier has been in place for 60 years and that it is practically indestructible. Its life is claimed to be at least 100 years, while that of treated pine, the best known substitute, is only 12 years. From this it is argued that it would be unfair in reproduction to substitute material which lasts only 12 years for bois d'arc, the life of which is indefinitely long. We are of the opinion that the question of whether or not the supply of bois d'arc is exhausted is immaterial. We are required to estimate the cost of reproducing the railroad as it exists on valuation date. In many instances it will be impossible to reproduce in kind, and we must therefore

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reproduce a plant by the substitution of the best known available and practicable materials. In the instant case such a substitute would be treated pine. Since the current price for treated pine is approximately the same as that used for bois d'arc, based upon past sales of these materials, it is clear no injustice would be done if a substitution became necessary, which is not entirely clear from the record. It follows that the prices taken in the tentative valuation are approved.

In the construction of the road certain secondhand dump plank was used. In reproduction the prices for secondhand plank in the same condition as when installed have been adopted. Objection is made that this should not be done, but that the prices of new plank should be used. From our discussion of secondhand materials, in an earlier part of this report, it follows that the action of the bureau in this regard is approved.

Account No. 8, ties.—The tentative valuation allows \$272,688 for ties wholly owned and used, whereas the carrier claims \$280,950. The only item in dispute is burnettized pine ties. We have applied a unit price of 56 cents per tie, while the carrier claims 68½ cents. There are 64,081 of these ties.

In valuation section No. 2, jointly owned by the carrier and the Houston & Texas Central Railroad Company, there are 71 of these ties, and in valuation section No. 5, jointly owned by the carrier and the St. Louis Southwestern Railway Company of Texas, there are 144.

The bureau is convinced that the price of 56 cents per tie which was applied is too low and recommends that it be increased to 69 cents per tie. The cost of reproduction new of ties wholly owned and used will be increased to \$281,112, and the cost of reproduction less depreciation to \$140,556. The cost of reproduction new of ties jointly owned and used by the carrier and the Houston & Texas Central Railroad in valuation section No. 2 will be increased to \$393 and cost of reproduction less depreciation to \$197. The cost of reproduction new of ties jointly owned and used by the carrier and the St. Louis Southwestern Railway Company of Texas will be increased to \$1,875 and the cost of reproduction less depreciation to \$938.

Account No. 9, rails.—The tentative valuation sets forth \$525,134 as the cost of reproduction new of rails wholly owned and used, whereas the carrier claims \$538,183. A price of \$34.55 per ton has been applied as the cost of new rails and a price of \$24 per ton for relay rails. No protest has been directed against the price for new rails, but the carrier claims that not less than \$29.50 per ton should be applied to relay rails. No testimony, however, as to the insufficiency of the unit price has been submitted. In its briefs the carrier contends that the price of \$24 per ton should be increased to \$34.55 per ton upon the premise that the price of new rails should be set

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forth in cost of reproduction new, notwithstanding the fact that relay rails were used in original construction. This contention has been disposed of by the discussion relating to "secondhand materials."

As nothing in this record tends to show that \$24 per ton for relaying rails is too low, the amount included in the tentative valuation under this head is approved.

Account No. 11, ballast.—The sum of \$210,637 has been estimated as the cost of reproduction new of ballast wholly owned and used, and the carrier claims \$287,697.

The ballast which has been used by the carrier is made up of cinders, sand, crushed stone, and burnt clay. The prices reported by us in reproduction and those claimed by the carrier are given below:

	Reported, per cubic yard.	Claimed, per cubic yard.
	<i>Cents.</i>	<i>Cents.</i>
Cinders.....	15	36
Sand.....	15	36
Crushed stone.....	65	80
Burnt clay.....	80	130

The cinders which are in the roadbed were produced by the carrier in the course of its operations. For the purpose of reproduction it has been assumed that the cinders would be obtained in the same manner. Under our accounting rules carriers are not permitted to charge to the ballast account any amount for cinders which are secured in this way, although they are permitted to charge for the expense of placing the cinders at the point where they are to be used. The price of 15 cents is made up of 10 cents for loading and 5 cents for unloading, to which has been added one-half cent per ton-mile for an estimated average haul. No testimony has been submitted which would justify a change in this amount.

The sand which was used by the carrier was obtained from sand pits along its right of way. In the theoretical reproduction of the property it has been assumed that the same pits would be available. Nothing has been allowed for the sand itself. This is fair when it is borne in mind that our land report includes the value of the sand pit before the sand is removed. The price of 15 cents embraces 10 cents for loading and 5 cents for unloading. One-half cent per ton-mile for an estimated average haul has been added to this figure. Testimony was offered to show that the cost of loading sand is from 12 to 15 cents per cubic yard, but our data, based upon actual contracts for similar work, justify the price of 10 cents.

No testimony was introduced with reference to the price used for crushed stone.

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It is with respect to burnt-clay ballast that the testimony of the carrier is principally concerned. Its chief witness introduced an exhibit purporting to show that the price of burnt clay ballast produced upon the St. Louis Southwestern Railway at the so-called Josephine, Tex., pit was \$1.60 per cubic yard. This exhibit was analyzed by our accountants and certain charges were found in the account which were improper. After eliminating the items which it is known should not have appeared in the account, the price per cubic yard was materially reduced. However, a further consideration of the facts of record leads to the conclusion that a price of 80 cents per cubic yard is too low, and that a price of \$1 per cubic yard should be accepted. The tentative valuation will be corrected upon this basis.

Account No. 12, tracklaying and surfacing.—The estimate of our engineer as to the cost of reproduction new of tracklaying and surfacing wholly owned and used, as set forth in the tentative valuation, is \$207,502, whereas the carrier claims \$268,319. At the time the estimate was made, the engineering program for the reproduction of the property contemplated the ballasting of the road before operations began. When this is done, it is unnecessary to provide as good a surface as when the ballasting is done after operations begin. All that is necessary is to provide a sufficient surface to permit the running of a work train over the tracks for transporting the ballast. A surface of this kind is called a running surface. After further consideration, our engineer believed that the better procedure to follow would be to assume that ballasting would take place after operations began. This course having been adopted, it was necessary to allow for a surface of sufficient durability to provide for the movement of traffic until the ballast was placed in position. This is called a full earth surface and is necessarily more expensive to construct than a running surface. On account of this change in the program the bureau has recommended an increase in the amount estimated under this account. In the estimate \$780 per mile of road has been employed, and the bureau suggests that this amount be increased by \$120 per mile. We are of the opinion that \$900 per mile of road for tracklaying and surfacing is reasonable and the valuation will be corrected upon this basis.

Account No. 15, crossings and signs.—The tentative valuation has stated for crossings and signs wholly owned and used \$29,565, whereas the carrier claims \$30,451. The carrier contends that the prices for excavation and embankment should be increased. It alleges that the same prices for these items should be applied in this account as are applied in Account No. 3, grading. This is correct, and that is what was done in arriving at \$29,565. We have approved a

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price of 15 cents per cubic yard for excavation and 13½ cents per cubic yard for embankment in the grading account. This is equally true with respect to property jointly owned and used.

Account No. 26, telegraph and telephone lines.—There has been included in the tentative valuation for telegraph and telephone lines wholly owned and used \$130, while the carrier claims \$8,857. The \$130 covers the estimated cost of reproduction of a telephone line from the general offices of the carrier to its machine shops, both at Terrell.

The telegraph line along the right of way of the carrier consists of three wires from Ennis to Kaufman, four wires from Kaufman to Terrell, three wires from Terrell to Greenville, and three wires from Commerce to Paris. There are also three wires from Greenville to Commerce paralleling the right of way of the St. Louis Southwestern Railway Company of Texas. The carrier has the exclusive use of one wire from Ennis to Paris and the Western Union Telegraph Company has the exclusive use of the remaining wires. The labor of constructing all the telegraph lines from Ennis to Paris was performed by the carrier but the materials were furnished and are owned by the telegraph company. In view of the fact that title to this property is in the telegraph company the bureau allowed nothing to the carrier in estimating the cost of reproduction new.

A telegraph line is necessary in the conduct of the business of the carrier and for the purposes of estimating cost of reproduction new of its property it is assumed that it would equip itself with this facility in the same manner that it did originally. Therefore the carrier would be obliged to perform the same amount of work in a theoretical reproduction of the property as it did in original construction. Such work estimated at prices prevailing on valuation date would amount to \$8,715. This amount will be added to the cost of reproduction new as stated in the tentative valuation.

Account No. 39, assessments for public improvements.—For reasons set forth in an earlier part of this report, the omission under this head is approved.

Account No. 1, engineering.—The general principles which shall govern in estimating this account have already been discussed and stated. The tentative valuation has included on account of engineering \$54,926, whereas the carrier claims \$126,700. The figure was arrived at upon the synthetical basis, before the percentage plan was adopted, and represents the estimate of our engineer for property wholly and jointly owned and used by the carrier. When the percentage plan was adopted by the bureau, the allowance figured about 2.15 per cent of the total amount of investment in the road accounts exclusive of engineering and land, and it was allowed to stand. The

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sum claimed by the carrier is between 5 and 6 per cent of the total amount of such accounts. On account of the increase in the estimates for cost of reproduction new of certain items made herein in the road accounts, the amount stated above represents less than 2 per cent and must be increased. Upon further consideration we think that while the reproduction of the road would present no engineering difficulties, the percentage should be increased to $2\frac{1}{4}$ per cent. Upon this basis the amount of engineering for property wholly owned and used would be \$58,773; for valuation section No. 2, jointly owned by the carrier and the Houston & Texas Central Railroad, \$45; for valuation section No. 3, jointly owned by the carrier and the Texas & New Orleans Railroad, \$58; for valuation section No. 4, jointly owned by the carrier and the Missouri, Kansas & Texas Railroad of Texas and St. Louis Southwestern Railway of Texas, \$113; and valuation section No. 5, jointly owned by the carrier and the St. Louis Southwestern Railway Company of Texas, \$814. These amounts will be shown in the final valuation, which will also show the Texas Midland's assignable proportions thereof.

Account No. 55, motor equipment of cars.—The tentative valuation states the cost of reproduction new of motor equipment of cars wholly owned and used as \$57,020, whereas the carrier claims \$57,780. The carrier owns two motor passenger cars, and at the time of their purchase had no one in its employ capable of operating them. While it is not entirely clear from the record, it appears that these cars were delivered by the manufacturer ready for operation and that no setting-up charge was necessary. However, at the request of the carrier, the manufacturer loaned the services of two men to educate employees of the carrier to operate these cars. The expenses in connection with the employment of these men amounted to \$760, and it is claimed that this figure should be included in the cost of reproduction new. The exclusion of this amount from the tentative valuation is approved.

Account No. 57, work equipment.—The tentative valuation states the cost of reproduction new of work equipment wholly owned and used as \$73,236, whereas the carrier claims \$75,736. The item in dispute in this account is a locomotive crane. The carrier purchased this crane secondhand for \$5,000. It is asserted that previous to its acquisition the crane had been in service only four or five days, and that it was worth its market value new, or \$7,500. The tentative valuation placed it at \$5,000 plus \$831 freight from Cleveland, as the cost of reproduction new, while the carrier contends that \$7,500 plus \$831 freight should be allowed. The estimate of \$5,000 was based upon the market price of a crane in the same condition as this one was when it was purchased by the carrier and placed in its present

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service. This method was approved in our previous discussion relative to "secondhand materials."

General Expenditure Accounts Nos. 71 to 77, except Account No. 76, interest during construction.—In cost of reproduction new, under general expenditures, exclusive of interest during construction, the tentative valuation fixed \$32,002, whereas the carrier claims \$147,750. During the progress of the work of valuation in this case the engineer built up the general expenditure accounts by estimating each account, but subsequently the bureau adopted a method of including $1\frac{1}{2}$ per cent of the total amount of investment in the road accounts, exclusive of land, plus any charter fee or fees which are more than nominal in amount. We have approved this method in a previous portion of this report. No unusual charter fee has been paid by the carrier in this proceeding, and in the cost of reproduction new, under the general expenditure accounts figured upon the basis set forth an amount of \$40,064, will be inserted in the valuation. Estimates upon the same basis will be included in the report on the property jointly owned and used.

Account No. 76, interest during construction.—The tentative valuation found \$144,691 as the cost of reproduction new of interest during construction, whereas the carrier claims \$264,487. In estimating the figure the engineer considered the amount of money needed each month in the reproduction of the property based upon the program of construction, and applied the interest rate to one-half of the total expenditures in the road accounts, with the exception of land, for the total period allowed for construction. The method which the bureau has adopted with respect to this item has been discussed and approved in an earlier part of this report. In accordance with that method \$144,280 will be inserted under this head for property wholly owned and used. This figure is computed at 6 per cent on the total investment in the road and general expenditures accounts, with the exception of land and interest during construction, for one-half the construction period, plus three months. To this has been added 6 per cent on the total investment in the equipment accounts for three months. Interest during construction figured upon this basis will be included in the valuation of property jointly owned and used.

Contingencies.—In the tentative valuation we did not make any allowance for contingencies as such, and the carrier claims that \$149,838 should be arrived at under this head. We have discussed and approved the action of the bureau in excluding this item.

DEPRECIATION.

The act requires us to report in detail as to each piece of property "the cost of reproduction less depreciation." In complying with 75 I. C. C.

this requirement the bureau has treated depreciation as the exhaustion of capacity for service. It has inquired how much of such capacity existed when new, what part has been used up, and what part still remains. It states the remaining capacity as a fraction of which the total is the denominator and the part remaining the numerator. Taking cost of reproduction new the depreciation which has already accrued is subtracted, due consideration being given to salvage or scrap when this exists, and the remainder is given as cost of reproduction less depreciation.

The carrier insists that this conception of depreciation is wrong, that the inquiry should be whether the property is in 100 per cent efficiency. So long as it is maintained at 100 per cent efficiency, or what comes to the same thing, so long as there is no deferred maintenance, there can be no depreciation.

This is clearly stated in the brief of the carrier, where it is said:

It is apparent, from the testimony received on the subject of depreciation and from the questions and statements of the Director during the introduction of the same, that *the principal difference is one of definition of depreciation*. The witnesses called by the carriers—men of candor, ability and experience—while fully recognizing deterioration from age and use and the necessity of repairs and replacements of perishable elements, state that *in the absence of deferred maintenance there is no depreciation*.

It will be seen, therefore, that the question presented by the record in this case for determination touching depreciation is whether the theory of the bureau or that of the carrier is correct.

When the act was passed the phrases "cost of reproduction new" and "cost of reproduction less depreciation" had come to have a clearly defined and well understood meaning. The conception of depreciation as used in this connection was the equivalent of that put upon it by the bureau. There were differences of opinion as to the part which physical deterioration and functional depreciation should play and all persons were not agreed whether depreciation and life were essentially identical; that is, whether an article might not depreciate more rapidly in the first years of its existence than in the last, or vice versa, but all were agreed upon the fundamental concept that depreciation means decline in value due to loss of capacity for service. An article was assumed to have incorporated in it a certain amount of use when new; a certain part of that use had gone; and so much remained.

Reference might be made to hundreds of instances in which this idea of depreciation when the act was passed had been used in valuation proceedings by individuals, by commissions, and by courts. It is doubtful if any case can be found where it had been deliberately assumed that depreciation and deferred maintenance were synonymous.

Not only have valuator and utility commissions adopted this view of depreciation, but the same definition has been assumed and acted upon by courts, including the Supreme Court of the United States.

This question was first definitely before that court in *Knowville v. Water Co.*, 212 U. S., 1. It was held that in determining the value of a water plant upon the basis of reproduction cost, the depreciation which had already accrued must be taken into account. It is evident from the language of the opinion that the depreciation which the court had in mind was exactly the kind of depreciation which the bureau has applied. The court said, at pages 9 and 10:

The cost of reproduction is one way of ascertaining the present value of a plant like that of a water company, but that test would lead to obviously incorrect results if the cost of reproduction is not diminished by the depreciation which has come from age and use. * * *

* * * The items composing the plant depreciate in value from year to year in a varying degree. Some pieces of property, like real estate, for instance, depreciate not at all, and sometimes, on the other hand, appreciate in value. But the reservoirs, the mains, the service pipes, structures upon real estate, standpipes, pumps, boilers, meters, tools and appliances of every kind begin to depreciate with more or less rapidity from the moment of their first use. It is not easy to fix at any given time the amount of depreciation of a plant whose component parts are of different ages with different expectations of life. But it is clear that some substantial allowance for depreciation ought to have been made in this case. * * *

On pages 13 and 14 the following occurs:

A water plant, with all its additions, begins to depreciate in value from the moment of its use. Before coming to the question of profit at all the company is entitled to earn a sufficient sum annually to provide not only for current repairs but for making good the depreciation and replacing the parts of the property when they come to the end of their life. The company is not bound to see its property gradually waste, without making provision out of earnings for its replacement. It is entitled to see that from earnings the value of the property invested is kept unimpaired, so that at the end of any given term of years the original investment remains as it was at the beginning. It is not only the right of the company to make such a provision, but it is its duty to its bond and stock holders, and, in the case of a public service corporation at least, its plain duty to the public.

This case is full authority for the proposition that depreciation is not deferred maintenance but covers loss of capacity for use due to age, inadequacy, etc.

The Supreme Court approves the same idea of depreciation in *Cedar Rapids Gas Co. v. Cedar Rapids*, *supra*. The report of that case does not clearly show the manner in which depreciation was treated, but the record does. The master determined the cost of reproduction and subtracted from that the depreciation estimated according to the rule approved by the court in the *Knowville Water* 75 I. C. C.

Case, supra. The gas company did not attack the correctness of this method, but claimed that a sufficient amount was not allowed for depreciation in stating its annual net return. The valuation as fixed by the master and by the court below was approved by the Supreme Court at page 670 in the following language:

In this case the court fixed a value on the plant that considerably exceeded its cost and estimated that under the ordinance the return would be over 6 per cent. Its attitude was fair and we do not feel called upon to follow the plaintiff into a nice discussion of details. We perhaps should have adopted a rule as to depreciation somewhat more favorable to the plaintiff, or, it may be, might have allowed this or that item that the state court struck out, but there is nothing of which we can take notice in the case that could warrant us in changing the result or in saying that the plaintiff did not get as much as it could expect when leave was reserved for it to try again.

To the same import is *Des Moines Gas Co. v. Des Moines, supra.* The questions presented to the court in this case were upon going-concern value and the cost of replacing certain pavement, but the method of valuation was approved. The master had determined the value of the property by ascertaining the cost of reproduction new and subtracting therefrom depreciation. That this depreciation which the court approved was not mere deferred maintenance but was estimated upon the theory applied by the bureau clearly appears from the language of the court on pages 161 and 162:

What is called in this summary "the present value of physical property," the report shows was arrived at by the master in the manner following: He first found what he thought was the base value of the property, i. e., "what it would cost to produce it at the present time new, without adding thereto any overhead charges." This figure he fixed at \$1,975,026. To this he added overhead charges, 15 per cent—\$296,254. From this he deducted depreciation, \$333,878, leaving as the value of the property thus ascertained, \$1,937,402.

The *Minnesota Rate Cases, supra*, are full authority for this same proposition. The question before the court was upon the value of the property of certain carriers. The master in determining this value had ascertained the cost of reproduction new but had declined to make any deduction on account of depreciation, holding that appreciation in its various forms would more than offset depreciation. This method of treatment was disapproved by the Supreme Court, which held that appreciation if it existed should be shown and that depreciation must be subtracted.

What the court meant by depreciation clearly appears from the opinion, where on pages 456 and 457 it is said:

The master allowed the cost of reproduction new without deduction for depreciation. It was not denied that there was depreciation in fact. As the master said, "everything on and above the roadbed depreciates from wear and weather stress. The life of a tie is from eight to ten years only. Structures become antiquated, inadequate, and more or less dilapidated. Ballast requires

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renewal, tools and machinery wear out, cars, locomotives, and equipment, as time goes on, are worn out or discarded for newer types." But it was found that this depreciation was more than offset by appreciation; * * *.

We can not approve this disposition of the matter of depreciation. It appears that the master allowed, in the cost of reproduction, the sum of \$1,613,612 for adaptation and solidification of roadbed, this being included in the item of grading and being the estimate of the engineer of the state commission of the proper amount to be allowed. It is also to be noted that the depreciation in question is not that which has been overcome by repairs and replacements, but is the actual existing depreciation in the plant as compared with the new one. It would seem to be inevitable that in many parts of the plant there should be such depreciation, as for example in old structures and equipment remaining on hand. And when an estimate of value is made on the basis of reproduction new, the extent of existing depreciation should be shown and deducted. This apparently was done in the statement submitted by this company to the Interstate Commerce Commission in the *Spokane Rate Case* in connection with an estimate of the cost of reproduction of the entire system as of March, 1907. (See 15 I. C. C. Rep. 395, 396.) * * *

The *Knoxville Water Case* was decided in 1909, the *Minnesota Rate Cases* in 1913. In the interval much had been said upon this subject of depreciation but the above quotation clearly shows that the Supreme Court had in no respect departed from the rule originally laid down.

It may also be noted that the view of our own court of final resort is identical with that adopted in England as appears from *National Telephone Co. v. His Majesty's Postmaster General*, 16 A. T. & T. Co. Com. Leaflets, 491, 509. That case grew out of the taking over by the English government of the property of the National Telephone Company and the Court of the Railway & Canal Commission of Great Britain held that depreciation must be deducted from cost of reproduction and that it should be reckoned upon the straight-line method, exactly as has been done in the pending case.

It is clear, therefore, that when the act was passed, the word "depreciation" as used in the phrase "cost of reproduction less depreciation" had acquired a definite meaning. It must be assumed that Congress used the word in that sense. Nor is there to-day any other recognized meaning. We approve and adopt the definition of depreciation which the bureau has applied in this case.

While this disposes of the general contention made by the carrier upon this record and while no general discussion of the evidence presented seems necessary, a word should perhaps be said as to one phase of that testimony.

Many witnesses were produced by the carrier who testified that certain articles, especially rolling stock, could by repairs and renewals be indefinitely continued in service and that therefore it was impossible to assign to such articles a total life or a remaining life.

This testimony does not tend to support the contention of the carrier.
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rier that depreciation and deferred maintenance are identical. Even though it may be possible to prolong without limit the life of a car by supplying different parts as they wear out, it would by no means follow that an old car is of the same value, estimated either in dollars or in service units, as a new car; the real point of the testimony is that the method of the bureau can not as a practical matter be applied.

This testimony does not state the exact fact. Cars do go out of service, but it is true that ordinarily a new car of the same type would not be ordered to replace the old car. In other words, cars are ordinarily sent to the scrap heap because they are obsolete or inadequate rather than because they can not be repaired.

That this fact is fully recognized by the bureau in its depreciation methods will be seen by observing the manner in which a car, for example, is depreciated. While the life of the car itself may be indefinitely prolonged, the different parts of that car wear out and must be replaced. The car is therefore divided into three such parts, the trucks, the underframe, and the body, and each one of these parts is depreciated by itself. The three are then combined into a weighted average from which the condition per cent of the car is determined. The weighted average may be taken itself as the condition per cent or may be reduced if the type of the car is such that its use will not be continued in the future.

The same rule is applied to locomotives and other rolling stock and also in a degree to certain buildings and structures.

While no general attack was made upon the manner in which depreciation had been estimated in case of the Texas Midland, if the principle underlying our methods was correct, there is a suggestion that too short a life has been applied to rail in the main track and to bois d'arc timber in the various uses where it is found. In the tentative report 25 years had been named as the life of the rail in the main line. After conference between the carrier and the bureau the bureau recommended that this item be increased to 40 years, which appears to be sufficient, although no definite figure can be named with absolute certainty. The life of bois d'arc has for the purpose of this case been taken as 100 years, which would not seem to require revision.

LANDS.

The protest raises two questions, which in fact are one: (1) Shall the Commission ascertain and report the reproduction cost of carrier lands, and (2) shall the Commission ascertain and report the present cost of condemnation and damages or of purchase of the carrier's lands? Together these questions present the issue as to the duty of the Commission to report the reproduction cost of lands.

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What is meant by present value, as the term is used in the tentative valuation, is thus defined by the director of valuation:

Present value * * * is arrived at by ascertaining the number of acres of land owned or used by the carrier for its purposes as a common carrier and multiplying this acreage by a market value determined from the present market value of similar adjacent and adjoining lands. Due allowance is made for any peculiar value which may attach by reason of the peculiar adaptability of the land to railroad use.

Nothing is included for the expense of acquisition, nor for severance damages, nor for interest during construction.

The second paragraph in the act, entitled "First," is general in terms, and directs the Commission to ascertain and report in detail as to each piece of property owned or used by the common carrier under investigation for its purposes as a common carrier, the original cost to date, the cost of reproduction new, the cost of reproduction less depreciation, and an analysis of the methods by which these several costs are obtained, and the reasons for their differences, if any. There is no substantial question raised by the protest as to the reporting of original cost to date of lands. The essential question is with respect to the reporting of the cost of reproduction new.

The paragraph of the act entitled "Second" requires:

Such investigation and report shall state in detail and separately from improvements the original cost of all lands, rights of way, and terminals owned or used for the purposes of a common carrier, and ascertained as of the time of dedication to public use, and the present value of the same, and separately the original and present cost of condemnation and damages or of purchase in excess of such original cost or present value.

The paragraph entitled "Third" relates to property held for purposes other than those of a common carrier; and such investigation and report is required to show separately such property, and the original cost and present value of the same, together with an analysis of the methods of valuation employed.

The sixth paragraph, entitled "Fifth," relates in part to land grants, which are not here involved. The paragraph also provides:

The Commission shall ascertain and report the amount and value of any aid, gift, grant of right of way, or donation, made to any such common carrier, or to any previous corporation operating such property, by the government of the United States or by any state, county, or municipal government, or by individuals, associations, or corporations.

It was suggested upon argument that the paragraph entitled "Second" could apply only to properties as to which there had been an original cost, and that lands which cost the carrier or its predecessors nothing were governed by the paragraph entitled "Fifth." It was urged that lands which cost the carrier nothing were to be excluded from the direction in paragraph "Second" as to the ascertainment of the original and present cost of condemnation and dam-

ages or of purchase in excess of such original cost and present value. Unless the present cost of condemnation and damages or of purchase is to be reported, which is not contemplated by the tentative report, it is unnecessary to construe these two paragraphs with respect to this contention. Applying familiar rules of statutory construction, the fact that lands, rights of way, and terminals are given specific detailed treatment in paragraphs "Second" and "Fifth" of the act points out that the latter specific requirements are to be followed rather than the preceding general language.

However, the direction in paragraph entitled "Second" for the ascertainment of the present cost of condemnation and damages or of purchase in effect calls for a finding as to the cost of reproduction of these lands. Must this be done, and can this be done? It seems elementary that the cost of reproduction can be estimated only by assuming that the thing in question is to be produced again, and that if it is to be produced again, it is to be taken as not existent. It seems sophistry to contend that lands of the railroad can be produced again at a cost to the railroad without first making the assumption that they are no longer lands of the railroad; and this necessary assumption carries with it the mental obliteration of the railroad itself.

Considerable testimony was produced to the effect that in the acquisition of a railroad right of way it is necessary for the carrier to pay sums in excess of the value of the land if measured by the present or market value of similar contiguous lands, and this because of the elements which have been enumerated and embraced in the protest, such as cost of acquisition, damages to the severed property, cost of buildings and other improvements, accrued taxes and various incidental rights. It was testified that inquiry had shown that a relationship could be found in particular cases between the sums which the carrier must pay and the present or market value of a like area of similar, contiguous property; and it was claimed that such sum could be estimated in advance of construction within a few per cent of the amount which would actually be required. There is also testimony that certain state commissions, in attempting to determine the cost of reproduction of railroad lands, had made use of multiples of the value of adjacent, similar land for this purpose.

But it will be observed that in each of these cases, other than the state commission valuations, the testimony before us related to the actual production of a railroad where no railroad had been before; and in none of these cases did the facts exist which necessarily must be assumed for a rational conception of the process of reproduction. That there is a marked difference between assuming in advance the total cost of acquisition, whether as the result of condemnation and

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damages paid or of purchase, in excess of the present value of similar lands in the vicinity, when no railroad has been constructed or is in operation, and the attempt to ascertain and state the cost of reproducing or reacquiring, at the present time, lands which actually have been severed from the adjacent property, have been converted into a railroad, and are being occupied by an operating rail carrier, seems clear.

We are unable to differentiate the character of testimony before us from that which was before the Supreme Court in the *Minnesota Rate Cases*, *supra*. That decision, rendered June 9, 1913, slightly over three months after the enactment of the act, was the climax of a long series of attempts made by various state commissions and courts to apply the cost of reproduction theory to railroad lands.

The Supreme Court pointed out the nature of the assumptions which must be made in the endeavor to apply the cost-of-reproduction theory to lands. In those cases was involved the estimate of the value of the property of the railroad within the state of Minnesota as a necessary factor in determining whether the legislative-made rates at issue were confiscatory. The question presented, said the Court, was as to the soundness of the underlying estimate of value, and whether it might be accepted as a basis for a finding that the rates were confiscatory.

In the master's report was an item for "lands for right-of-way, yards, and terminals, \$21,024,562," which did not include any improvements. This value was arrived at by adding 5 per cent to the appraisalment of the terminal properties "for the cost of acquisition and consequential damage," and 25 per cent was added in the case of the Duluth terminals for railway value, cost of acquisition, and consequential damages. The manner in which the base figure was deduced is afterwards stated herein. There was a protest by the state authorities against the sum so reported, and the court thus summarizes the basis for the protest:

It is contended that the valuation was made upon a wrong theory; that it is a speculative estimate of "cost of reproduction"; that it is largely in excess of the market value of adjacent or similarly situated property; that it does not represent the present value, in any true sense, but constitutes a conjecture as to the amount which the railway company would have to pay to acquire its right-of-way, yards and terminals, on an assumption, itself inadmissible, that, while the railroad did not exist, all other conditions, with respect to the agricultural and industrial development of the state and the location, population, and activities of town, villages, and cities, were as they now are. [P. 444.]

The method pursued in ascertaining the base figures is thus stated by the Supreme Court:

(a) *Lands outside terminals*.—The complainants' witness was Mr. Cooper, the land commissioner of the company, who has charge of the land grants for

its entire system, of its right-of-way and land purchases, and has had a wide experience in connection with land values along the lines of the railway. In the latter part of 1906, the state notified the company to report the value of its properties, requiring a statement in one column of the "market value" and in another column, of the "value for railway purposes." Mr. Cooper was instructed to prepare the valuation for this report. From the information he received in special inquiries, and his own knowledge, and following what he understood to be the instructions from the state, he set down under the heading of "market value," not the market value in the proper sense of that term, but what in his judgment it would cost the railroad company to acquire the land. This included an excess which he estimated the company would have to pay over the market value of contiguous and similar property if it were called upon to undertake such a reproduction of its right-of-way. It did not, however, embrace an allowance for payments which might have to be made for improvements that possibly might be found upon the property in such case, or for the consequential or severance damages which might possibly have to be met, or for the expense of acquisition. These supposed additional outlays he undertook to estimate. For this purpose he increased the "market value" as stated (in the case of agricultural lands generally multiplying it by three) and thus reached the amount set down as the "value for railway purposes." [P. 445.]

Local real estate experts were employed to appraise the terminal properties at St. Paul, Minneapolis, and Duluth. They were instructed "to make a conservative report of the cost of reproducing the properties owned by the company in each of their respective cities." Mr. Cooper, after discussing with these experts the estimates made by them, employed his own knowledge and formed his own judgment, which he reported to the state under the heading of "market value." His estimate of market value was "what it would cost the company to purchase these lands, exclusive of improvements that might be made upon them, severance and consequential damages and expenses incident to acquisition." The master adopted the Cooper figures without change as to the St. Paul and Minneapolis terminals, and added 5 per cent to cover the cost of acquisition and consequential damages. As the Duluth appraisal seemed to have been based upon the ordinary values of real estate, and not on as liberal a basis as that at the twin cities, the master added 25 per cent for "railway value, cost of acquisition and consequential damages."

In reviewing the findings, the court below reached the conclusion that "the master in effect found that the cost of reproduction and the present value of the lands for the terminals in the three great cities, including therein all cost of acquisition, consequential damages, and value for railroad use which he allowed, was only about 30 per cent more than the normal value of the lands in sales between private parties. He found the value of the lands outside the terminals to be only twice their normal value."

From our examination of the evidence we are unable to conclude that the excess stated may be thus limited. What is termed the normal value does not satisfactorily appear. It further will be observed—from the summary of valua-

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tions we have set forth in the margin—that the amount thus allowed in item 1 for lands, yards, and terminals, both in and out of the three cities (\$21,024,562), was included in the total on which 4½ per cent was allowed in item 30 for “engineering, superintendence, legal expenses,” and again was included in the total on which 5 per cent was allowed in item 37 for “contingencies,” and, in addition, was included in the total on which 10 per cent was allowed in item 39 for “interest during construction.” [P. 450.]

The fundamental objections to the application of the theory of reproduction to railway lands are thus stated by the court:

These are the results of the endeavor to apply the cost-of-reproduction method in determining the value of the right of way. It is at once apparent that, so far as the estimate rests upon a supposed compulsory feature of the acquisition, it can not be sustained. It is said that the company would be compelled to pay more than what is the normal market value of property in transactions between private parties; that it would lack the freedom they enjoy, and, in view of its needs, it would have to give a higher price. It is also said that this price would be in excess of the present market value of contiguous or similarly situated property. It might well be asked, who shall describe the conditions that would exist, or the exigencies of the hypothetical owners of the property, on the assumption that the railroad were removed? But, aside from this, it is impossible to assume, in making a judicial finding of what it would cost to acquire the property, that the company would be compelled to pay more than its fair market value. It is equipped with the governmental power of eminent domain. In view of its public purpose, it has been granted this privilege in order to prevent advantage being taken of its necessities. It would be free to stand upon its legal rights and it can not be supposed that they would be disregarded. [Pp. 450-451.]

The manner in which the “railway value” was found has been stated. It was based on a consideration of the market value in the usual acceptance of the word, to which was added what it was estimated it would cost the railroad to acquire the land, and the sum was multiplied by three, in the case of agricultural lands, so as to cover improvements which might be on the land and the consequential and severance damages, and the cost of acquisition. Then the court states the usual rules of damages upon condemnation of lands:

* * * supposing the railroad to be obliterated and the lands to be held by others, the owner of each parcel would be entitled to receive on its condemnation, its *fair market value* for all its available uses and purposes. * * * If, in the case of any such owner, his property had a peculiar value or special adaptation for railroad purposes, that would be an element to be considered. * * * But still the inquiry would be as to the fair market value of the property; as to what the owner had lost, and not what the taker had gained. * * * The owner would not be entitled to demand payment of the amount which the property might be deemed worth to the company; or of an enhanced value by virtue of the purpose for which it was taken; or of an increase over its fair market value, by reason of any added value supposed to result from its combination with tracts acquired from others so as to make it a part of a continuous railroad right of way held in one ownership. * * * There is no evidence before us from which the amount which would properly be allowable in such condemnation proceedings can be ascertained. [Pp. 451-452.]

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The court then points out what must be assumed in an attempt to estimate the cost of reproduction of lands:

Moreover, it is manifest that an attempt to estimate what would be the actual cost of acquiring the right-of-way, if the railroad were not there, is to indulge in mere speculation. The railroad has long been established; to it have been linked the activities of agriculture, industry and trade. Communities have long been dependent upon its service, and their growth and development have been conditioned upon the facilities it has provided. The uses of property in the communities which it serves are to a large degree determined by it. The values of property along its line largely depend upon its existence. It is an integral part of the communal life. The assumption of its nonexistence, and at the same time that the values that rest upon it remain unchanged, is impossible and can not be entertained. The conditions of ownership of the property and the amounts which would have to be paid in acquiring the right of way, supposing the railroad to be removed, are wholly beyond reach of any process of rational determination. The cost-of-reproduction method is of service in ascertaining the present value of the plant, when it is reasonably applied and when the cost of reproducing the property may be ascertained with a proper degree of certainty. But it does not justify the acceptance of results which depend upon mere conjecture. [P. 452.]

The evidence in these cases demonstrates that the appraisements of the St. Paul and Minneapolis properties which were accepted by the master were in substance appraisals of what was considered to be the peculiar value of the railroad right-of-way. Efforts to express the results in the terms of a theory of cost of reproduction fail, as naturally they must, to alter or obscure the essential character of the work undertaken and performed. Presented with an impossible hypothesis, and endeavoring to conform to it, the appraisers—men of ability and experience—were manifestly seeking to give their best judgment as to what the railroad right-of-way was worth. And doubtless it was believed that it might cost even more to acquire the property, if one attempted to buy into the cities as they now exist and all the difficulties that might be imagined as incident to such a "reproduction" were considered. The railroad right-of-way was conceived to be a property *sui generis*, "a large body of land in a continuous ownership," representing one of the "highest uses" of property and possessing an exceptional value. The estimates before us, as approved by the master, with his increase of 25 per cent in the case of the Duluth property, must be taken to be estimates of the "railway value" of the land; and whether or not this is conceived of as paid to other owners upon a hypothetical reacquisition of the property is not controlling when we come to the substantial question to be decided. [P. 453.]

What is "the substantial question to be decided"?

That question is whether, in determining the fair present value of the property of the railroad company as a basis of its charges to the public, it is entitled to a valuation of its right-of-way not only in excess of the amount invested in it, but also in excess of the market value of contiguous and similarly situated property. For the purpose of making rates, is its land devoted to the public use to be treated (irrespective of improvements) not only as increasing in value by reason of the activities and general prosperity of the community, but as constantly outstripping in this increase, all neighboring lands of like character, devoted to other uses? If rates laid by competent authority, state or national, are otherwise just and reasonable, are they to be held to be

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unconstitutional and void because they do not permit a return upon an increment so calculated? [Pp. 453, 454.]

After a short examination of the nature of public service property the court answers its own query:

* * * And where the inquiry is as to the fair value of the property, in order to determine the reasonableness of the return allowed by the rate-making power, it is not admissible to attribute to the property owned by the carriers a speculative increment of value, over the amount invested in it and beyond the value of similar property owned by others, solely by reason of the fact that it is used in the public service. That would be to disregard the essential conditions of the public use, and to make the public use destructive of the public right.

The increase sought for "railway value" in these cases is an increment over all outlays of the carrier and over the values of similar land in the vicinity. It is an increment which can not be referred to any known criterion, but must rest on a mere expression of judgment which finds no proper test or standard in the transactions of the business world. It is an increment which in the last analysis must rest on an estimate of the value of the railroad use as compared with other business uses; it involves an appreciation of the returns from rates (when rates themselves are in dispute) and a sweeping generalization embracing substantially all the activities of the community. For an allowance of this character there is no warrant.

Assuming that the company is entitled to a reasonable share in the general prosperity of the communities which it serves, and thus to attribute to its property an increase in value, still the increase so allowed, apart from any improvements it may make, can not properly extend beyond the fair average of the normal market value of land in the vicinity having a similar character. Otherwise we enter the realm of mere conjecture. We therefore hold that it was error to base the estimates of value of the right-of-way, yards, and terminals upon the so-called "railway value" of the property. The company would certainly have no ground of complaint if it were allowed a value for these lands equal to the fair average market value of similar land in the vicinity, without additions by the use of multipliers, or otherwise, to cover hypothetical outlays. The allowances made below for a conjectural cost of acquisition and consequential damages must be disapproved; and, in this view, we also think it was error to add to the amount taken as the present value of the lands the further sums, calculated on that value, which were embraced in the items of "engineering, superintendence, legal expenses," "contingencies," and "interest during construction."

By reason of the nature of the estimates, and the points to which the testimony was addressed, the amount of the fair value of the company's land can not be satisfactorily determined from the evidence, but it sufficiently appears for the reasons we have stated that the amounts found were largely excessive. [Pp. 454-456.]

It is contended that the *Minnesota Rate Cases* decision is inapplicable here because what was condemned in that case was the particular method there employed to show the cost of reproduction of land, and not what is here suggested by the carrier's witnesses as possible. It is urged that in the *Minnesota Cases* the market value of the railroad lands was not shown. What was condemned was the

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theory that the cost of reproducing the lands occupied by a railroad can be determined by a process of assuming a "railway value" estimated in multiples of the present fair average value of similar lands in the vicinity, and the condemnation of the court was upon the ground that impossible and contradictory assumptions must necessarily be the basis for the attempt to ascertain the present cost of a railroad's lands. We are unable to distinguish between what is suggested by the carrier in this record and nominally required by the act and what was condemned by the court as beyond the possibility of rational determination; nor is there any essential difference in the actual methods there employed and those now urged upon us. Before we can report figures as ascertained, we must have a reasonable foundation for our estimate, and when, as here, if the estimate can be made only upon inadmissible assumptions, and upon impossible hypotheses, such as those pointed out by the Supreme Court in the opinion quoted, our duty to abstain from reporting as an ascertained fact that which is incapable of rational ascertainment, is clear.

The decision in the *Minnesota Cases* has since been generally accepted by courts and commissions as settling the disputed question whether the cost of reproduction theory could be made to apply to lands of a railway. See *Louisville & N. R. Co. v. Railroad Commission*, 208 Fed., 35, 42; *Chicago & N. W. Ry Co. v. Smith*, 210 Fed., 632; *Ann Arbor R. Co. v. Fellows*, 236 Fed., 387.

In the *Denver Water Case* in the United States district court for the district of Colorado, to enjoin the enforcement of rates filed by authority of law, the special master reported, *inter alia*, the value of the utility's lands. He said:

The measure of value of lands adopted in considering the evidence is the present normal market value of similar lands in the same locality. *Minnesota Rate Cases*, 230 U. S., 352, at 449-456. It follows from this rule that the original cost of the lands is not necessarily the controlling factor, though such original cost has been considered along with all the other evidence in determining the value. It likewise follows from this measure of value that when the present normal market value of similar lands in the same locality has been determined, nothing can be added to such value on account of the actual or estimated consequential or severance damages—if any—paid by the water company when it originally acquired its lands or on account of the company's actual or estimated overhead expenses in connection with the purchase of these lands. These expenses represent original costs of the lands and not their present market value. In considering the evidence concerning the value of these lands I have assumed that we may take into consideration their adaptability or availability for any useful purpose, provided the evidence shows that lands possessing such adaptability or availability have any special market value on account thereof; but the final question in my judgment, always is, What is the present market value of similar lands in the same locality and not what are these lands worth now to the water company for the purposes for which they are now used?

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The utility excepted "because the master erred, as a matter of law, in refusing to consider, in determining the fair value of the lands, anything on account of the actual or estimated consequential or severance damages," and because he "erred in refusing to consider, in connection with the determination of the fair value of the lands, or to include therein, anything whatever on account of overhead expenses," claimed to be at least 10 per cent of the value of the lands for ordinary purposes. These exceptions were stricken by the district court. On appeal and cross appeal to the United States Supreme Court, that court treated as established the propriety of estimating the utility's property on the basis of present market values as to lands, and said that the method was fairly applied by the special master and was hardly disputed by the appellants, except as to certain matters other than his treatment of land. *Denver v. Denver Union Water Co.*, 246 U. S., 178.

The use of multiples in ascertaining the cost of reproduction of lands embraced in railroad rights of way was discontinued by the Washington and California commissions, reversing their former practice and their earlier decisions. *Public Service Comm. v. Seattle, Renton & S. R. Co.*, 4 Wash. Pub. Serv. Com. Ann. Rep. (1914), 132, 134; *In re Value of Quincy Western Ry. Co.*, 8 Cal. R. R. Com. Dec., 340. This interpretation of the *Minnesota Cases* has been accepted as to telephone rights of way by the Colorado and Washington Commissions. *Re Mountain States Teleph. & Teleg. Co.*, Colo. Pub. Util. Comm., P. U. R., 1917, B, 198, 265; *Public Service Comm. v. Pacific Teleph. & Teleg. Co.*, Wash. Pub. Serv. Comm., P. U. R., 1916, D, 947, 54 A. T. & T. Co. Com. L., 171, 174. Certain other state commissions have never used multiples for the purpose of determining the cost of reproduction of lands. *Re Illinois Terminal Ry. Co.*, 4 Ill., P. U. Com. Rep. 263, 266; *Re Portland Ry. L. & P. Co.*, Oreg. Pub. Serv. Comm., P. U. R., 1916, D, 976, 1022.

Not alone do the uncertainties which we have referred to surround what would be the conditions of ownership, of improvement, and of value of near-by property, and of general industrial development, but there can be no certainty as to what land would have to be acquired at a cost to the carriers upon reproduction or a present acquisition. The carrier has been constructed within comparatively a recent period of time; nothing in the record shows us that the reproduction of the road would be regarded in any less friendly spirit by the community as a whole and individual owners in particular, than when the right of way and terminals in question were acquired but a few years back. As appears elsewhere in this report, of approximately 1,933.065 acres of carrier lands, 511.008 acres were acquired by the carrier through aids, gifts, grants of right of way, and donations.

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Of the total original cost of the carrier lands, approximately 40 per cent was donated by citizens of various communities along the line. That all such donated lands would necessarily have to be bought or condemned and paid for at the full amount which a jury would award on condemnation is an assumption we do not feel warranted in making from the record before us. Because of the impossibility of making the self-contradictory assumptions which the theory requires when applied to the carrier's lands, we are unable to report the reproduction cost of such lands or its equivalent, the present cost of acquisition and damages, or of purchase in excess of present value. The present value of lands as found by us appears in the final valuation, appended hereto.

Controversies concerning the present value of lands of the carrier, as measured by the fair average of the normal market value of lands in the vicinity having a similar character, were composed with the result that figures contained in the tentative valuation are changed as follows:

Additions.

	Acres.	Present value.
Item No. 8, shown in carriers' summary statement No. 1, exclusive of subdivision (b)	5.825	\$1,202.84
Item No. 9, shown in said summary	1.9575	7,825.95
Zone 51, Hunt county	1.92	1,728.00
Zone 6, Ellis county	(1)	828.00
Zone 7, Ellis county	(1)	878.90

¹ Increase in unit of value; no change in area.

The acreage and values now shown in the tentative valuation as lands in former streets, alleys, and highways used exclusively by the carrier, are transferred to and shown instead as lands owned and used for its purposes as a common carrier, and the 0.13 acre with present value of \$29.90, now shown as lands in former streets, alleys, and highways used exclusively by the carrier, is corrected to read 0.13 acre, present value \$91.

Deductions.

	Acres.	Present value.
Zone 8, Ellis county (parcels 11 and 12)	0.54	\$540.00
Zone 33, Kaufman county (lot 4, block 19)	.23	287.50

STREETS AND HIGHWAYS.

As used herein the word "street" covers streets and alleys within municipalities, and the word "highway" covers public roads outside of such municipalities.

As a practical working solution of the many and intricate problems presented by this subject, which would require, for exact solu-

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tion in each case, an expenditure of time, money, and effort out of all proportion to the amounts involved, we make the following rulings:

Where a street or an alley in a municipality has been vacated, that is, where the use of land as a street or an alley has been discontinued, and the carrier is using the land exclusively for common-carrier purposes, the original cost of the land to the carrier, if it can be ascertained, and its present value, measured by the market value of similar land in the vicinity, will be included in the inventory as land owned by the carrier, unless it affirmatively appears that the carrier does not own it.

Where a street or an alley in a municipality is used as such by the public, and is also used by the carrier for its common-carrier purposes, either along or across the same, no part of the land so jointly used will be included in the inventory as land owned by the carrier, unless it affirmatively appears that the carrier owns it.

Where a highway outside of a municipality is used as such by the public, and is also used by the carrier for its common-carrier purposes, either along or across the same, the land so jointly used, together with its original cost to the carrier, if that can be ascertained, and its present value, measured by the market value of similar land in the vicinity, will be included in the inventory as land owned by the carrier, unless it affirmatively appears that the carrier does not own it.

In the final valuation, the tentative valuation of the Texas Midland will be corrected to such extent as the application of these rulings may render necessary.

A right secured by a carrier under a municipal ordinance, or other similar authority, may be either a mere license revocable at any time by the public authority, or it may be a contract which confers upon the carrier the right to use the land for a definite period of time or in perpetuity, depending upon the power of and the language used by the public authority in making the ordinance, and also depending upon the circumstances under which the ordinance is made by such authority and accepted and acted upon by the carrier.

The principles of law involved are set forth and fully explained in the case of *Seaboard Air Line Ry. v. City of Raleigh*, 242 U. S., 15. In that case the railway company sought to enjoin the enforcement of an ordinance repealing a right to construct a track upon a sidewalk and use the track for common-carrier purposes. This right was conferred upon the predecessor in interest of said railway company in 1881, and the facts concerning it and the decision of the court were as follows:

* * * the railroad company asked permission of the city authorities to extend a track to and along the sidewalk on the block in front of the compress,

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which was granted, the official record of the consent of the city having been manifested by the following entry in the minutes of the board of aldermen: "Upon application of John C. Winder, general superintendent, the Raleigh and Gaston Railroad Company was granted permission to occupy the sidewalk on the east side of Salisbury street, between Jones and Lane streets, for the purpose of running a track." In virtue of this consent a spur track projecting from the main tracks as they curved into the terminal block, was built which ran down to and upon the sidewalk in front of the compress. For many years this track was used for business going in and out of the compress, as well as for the general purposes of the railroad. In 1906, however, the compress ceased to be operated, and subsequently (about 1910 or 1911) the railroad company, owning the block on which the compress was situated, removed the same and built upon the block a warehouse. It was not possible, however, from the track on the sidewalk to directly reach such warehouse, as along the block where it fronted on Salisbury street tracks were laid between the warehouse and the spur track which for the purposes of the railroad were depressed below the level of the street and sidewalk, and thus the spur track on the sidewalk was only available for parking cars or as a team track and was alternately in use for one or the other of these purposes when the city adopted the assailed ordinance directing the removal of the spur track.

Under this statement it becomes at once apparent that the court below rightly decided that the contract right asserted had no existence since on the very face of the consent which was given a mere right to occupy was conveyed without any contract as to time and which therefore, taking the best view for the railroad, amounted to conferring upon it a mere license to put and use a track upon the sidewalk and therefore subject to the power of the city to revoke whenever it deemed the municipal interest required it to do so.

But the contention is that although it be conceded that the well-settled rule is that general implications may not be resorted to for the purpose of converting a grant of a municipality which is upon its face a mere license into a contract for a stated period or in perpetuity, nevertheless that rule is subject to a well-defined limitation or exception which as presented in the argument in various forms may be stated as follows: That where general powers are conferred and duties are imposed upon a corporation which from their nature and essential character presuppose the right to exert them or the duty to perform them during a specified time or in perpetuity, and a particular power or right is conferred on the corporation which has a necessary relation thereto or an essential connection therewith, although such particular power or right may not have expressly taken the form of contract or grant for a stated time or in perpetuity, nevertheless such result may be implied by considering the essential relation which the particular power or right granted bears to the general powers and duties possessed and the necessary connection between the two for the purpose of giving a common duration to both. * * *

But while the general rule is well founded and the exception or limitation by which it is asserted to be qualified is well settled, it has no relation to the case in hand, since the particular action of the city in question concerned a mere permission to exercise a facility as a license given long after the creation of the railway corporation and not inherently or in any degree necessarily controlling its power to discharge its corporate attributes. Indeed so much is this the case on the face of the situation here presented that it becomes apparent that to apply the limitation to a case like this would destroy the general rule itself.

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The contention that even though this be the case, inasmuch as the railroad had for a long time operated the spur track on the sidewalk and used it for its general railroad purposes with the assumed knowledge and assent of the city, thereby the existence of a contractual and permanent right must be inferred, is manifestly without merit. Indeed it amounts to saying that possession under a mere license was capable of causing that which was revocable and precarious to become contractual and permanent. [Id., pp. 17-20.]

In view of the above ruling of the Supreme Court we think it is obvious that many of the ordinances under which carriers are using streets and highways are mere licenses, and may be revoked at the pleasure of public authorities having jurisdiction in the premises without the payment of any damages to the carriers.

It is also apparent that the value to the carrier of the right to use land included in streets and highways is the same, regardless of whether the carrier has paid for the land or for the right to use it. And a similar statement may be made concerning the value to the general public of the services performed by the carrier in connection with the use of such land. See also *Manufacturers' Railway Co. v. U. S.*, 246 U. S., 457.

The right exercised by a carrier by virtue of a municipal ordinance or other similar authority to use a street or an alley jointly with the general public is similar in character to the privilege conferred upon a corporation operating a street railway and does not give the carrier an interest in land which may be measured by the value of land adjoining the street. The area of a street can not be considered simply as land and its value can not be measured in dollars. The laying out of a street transfers to adjoining lands the value of the land taken and included in the street.

In our opinion this right of a carrier is in the nature of a franchise and must, for valuation purposes, be treated the same as other franchises are treated and, as above stated, this is the theory upon which we have proceeded in valuing the lands of the carrier.

The two items of 24 acres and 16 acres in zone 12 in Delta County with an aggregate present value of \$2,640, now shown as noncarrier lands in the tentative valuation, are transferred to and shown instead as common-carrier lands owned.

APPRECIATION.

Carriers have introduced considerable testimony to show that an old roadbed is of more value than a new one and have urged that this value should be stated in some form in the report of the Commission.

As to the fact, no serious question can be made. While most items of property entering into the construction of a railroad depreciate

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from the first, the cut and embankment appreciate. The soft sides assume a natural slope, the earth becomes solidified and less susceptible to the action of the elements, vegetation frequently springs up which serves to hold in place the soil. The soft spots which at first develop in the embankment disappear.

The texture of the embankment and the bottom of the cut become firmer owing to the gradual settling together of the earth and the pounding of the trains.

All this tends to improve the quality of this part of the railroad. It is generally understood that in some respects the cost of maintaining the old railroad is less than the new and that trains can be operated over it with greater safety and economy. The real difficulty is to express in dollars or otherwise the extent of this appreciation and to determine just what report upon this item can be made to Congress.

The act nowhere refers to appreciation. It does require, as already noted, a statement of depreciation. Appreciation is the antithesis of depreciation, and it would be natural to show the two in the same connection, but depreciation is stated with reference to the life of an article while appreciation can not be so estimated.

The act requires the Commission to report upon other values and elements of value, and it is possible that the value of appreciation might properly be stated under this head, although it is generally understood that other values are intended to include the intangibles.

Without inquiring just what words in the act require a statement of appreciation, it is apparent that it was the intent of Congress to require a statement of all those costs, values, and other circumstances which might bear upon the value of the property, for rate-making purposes at least, and possibly for other purposes. Appreciation is a fact which may affect the final value of the property. Without attempting to indicate what its influence should be, or whether it should have any influence, it should if possible be dealt with in our report. Is it possible to ascertain and assign a value to this item? The carriers say that this can be done and have suggested a method for doing it.

Certain items of expense in the maintenance of a railroad are greater when new than when old. The side of the new cut washes down into the ditches along the track, which must therefore be frequently cleaned out. As time goes on the slope of the cut becomes somewhat changed and vegetable growth appears which tends to hold the sides in place. Under these influences the ditches require less attention.

The same thing is true of the embankment. When this is soft it readily washes away and the holes thus made must be filled up. Soft

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spots will develop both in embankment and in cut but especially in the embankment, which must be filled up and brought back to grade. This part of maintenance is more costly in the early days of operation than in later years.

Upon the other hand, certain items of maintenance are less at first. One of the large expenses of operation is the renewal of ties, which is inconsiderable during the first years. Rails need not be renewed for several years and often for many years. Ballast only begins to wear out after a considerable period of use. These items of maintenance are less at first. The net result seems to be that the total cost of maintenance during the early years is less than afterwards.

Carriers have undertaken to separate those items which are greater in the early years from those which are less and to determine the amount of those items year by year for the first five years of operation, contrasting them with the next five years. In this way a conclusion is reached that the average cost of maintaining a new road is so many dollars a year more per mile than for an old road. Sometimes it is assumed in these computations that appreciation would have been completed at the end of 5 years, in others that 10 years would be required for this purpose, while one or two witnesses were of the opinion that the process continued indefinitely.

Having determined the greater cost of maintaining the roadbed while appreciation is accruing, the value of appreciation is determined as follows: If it costs \$100 a mile per year less to maintain the roadbed after it has become solidified and adapted than before, then the added value of the appreciated over the new road is represented by the capitalization of this \$100. Since this road can be maintained for \$100 a mile less, the net income from the use of the road is \$100 per mile more per year and the purchaser buying it could afford to pay \$2,000 per mile more for the same, assuming that money in that form of investment were worth 5 per cent.

We have carefully examined the figures given by the carriers and have reached the conclusion that they do not warrant any definite finding. They may tend to show that the cost of maintenance with respect to the items enumerated are slightly more in the early days of the property than after the roadbed has become compacted and solidified, although if the figures given were the only evidence of this the conclusion would be extremely doubtful. To what extent, is the question and the figures of the carriers afford no answer to this. Any finding based on the testimony in this record would be only a guess.

It may also be noted that even if it were possible to state this added cost of maintenance, we should hesitate to give to it the application

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claimed for it by the carrier. If it has cost a carrier \$500 a mile to secure this appreciation, that may be a reason for adding that much to the present value of the property, but the carrier claims that if this \$500 per mile is the average excess in maintenance for five years, the added value would be \$2,000 a mile and not \$500.

Appreciation is not due to any addition to the property. All the carrier has done is to maintain the property. It has cleaned out the ditches, it has filled up the holes in the embankment, it has simply kept good the form and substance of the structure itself. The improvement is due to a natural process which takes place with the lapse of time and which is not the product of any effort or expenditure of the carrier.

If the cut under this process has grown larger, it is measured and the carrier is given credit for the size as it is found to-day. If an improvement like a retaining wall has been added, that is a betterment for which the carrier is credited. Whatever is there when the property is inventoried is embraced in the inventory.

The attempt to measure the value of appreciation by its cost is not consonant with our prescribed rules of accounting, under which the expenses of operation are chargeable to operation. There is no part of this expense which the carrier has carried or could properly carry into its investment account. If the public has once paid for this added expense, which is inherent in the early years of operation, should it be constantly taxed on account of these same expenses in the way of added rates?

Our conclusion upon the whole subject, therefore, is that no separate value can be placed upon appreciation. When it definitely appears that it exists it must be taken into account in determining the value of the property. The influence which appreciation should have upon value may depend upon the previous history of the property. All this depends upon the purpose for which the value is being stated and the manner in which that value is to be determined.

The Texas Midland claims we should include not less than \$61,000 for appreciation. The tentative valuation did not include this item. This claim is not supported by the record, and it follows the tentative report must be approved in this respect.

OTHER VALUES AND ELEMENTS OF VALUE.

The act requires that "the Commission shall in like manner ascertain and report separately other values, and elements of value, if any, of the property of such carrier, * * *

In the tentative valuation under consideration we have stated that "no other values or elements of value were found to exist." The

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carrier asserts that since no figure has been reported under this heading, the act has not been complied with.

Before the tentative valuation was served, the carrier was requested to file a statement of the items, if any, upon which an allowance under this heading was claimed. In response thereto claim was made on account of (1) going-concern value; (2) connection with other lines; (3) good station facilities; and (4) gradients.

At the hearing counsel for the carrier stated that he did not understand that the carrier would be expected to put in testimony with respect to its claim under this heading. The director of the bureau stated at that time that the Commission would be glad to listen to any testimony the carrier might care to offer. Notwithstanding this invitation, no testimony has been offered in this case with respect to the items under consideration.

We have diligently searched for and inventoried the property of the carrier and have reported everything we have found in the tentative valuation already served. The carrier has asserted that there are other values and elements of value in connection with its property, but although repeatedly asked to do so has failed to name a figure which it believes should be found by us. That it is unable to do so is shown by the following excerpt from the argument in this proceeding:

The CHAIRMAN. From the record as you understand it, what would be your claim on behalf of your clients, as to the nature and the amount, particularly as to other values and elements of value?

Mr. BUTLER. A sufficient sum which added to the amount your honors would attribute to the physical property would make the total value of the property not less than its cost of reproduction new.

The CHAIRMAN. If this Commission has the power to value the property, and if the value placed thereon were the cost of reproduction new, that would meet in full the claims of your clients?

Mr. BUTLER. As a final value?

The CHAIRMAN. Yes.

Mr. BUTLER. I would still insist upon the Commission's telling us how they got at other values and elements of value. I don't know how to do it very well. We will try to help on that as much as we can. But so far as concerns the Texas Midland, I can not outline a proper basis for stating the ascertainment of other values and elements of value.

In this connection it should be stated that in the instant case going-concern value has been given consideration in the cost of reproduction new and cost of reproduction less depreciation figures. In the cost of reproduction new and cost of reproduction less depreciation figures the values assigned to the property are not those of a dead plant but of a going concern, and to the extent indicated in the *Des Moines Gas Case* cited below, this element has been covered in the figures. Going-concern value has been described as the value of an assembled

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and established plant doing business over one not thus advanced. In making up the inventory we apply prices to the different parts of the property in the light of the fact that it is a railroad and doing business; otherwise the prices which would be applied would be scrap prices. That going value is recognized in an inventory of this kind is established by the following quotation from the decision of the Supreme Court in *Des Moines Gas Co. v. Des Moines*, *supra*:

What is called in this summary "the present value of physical property," the report shows was arrived at by the master in the manner following: He first found what he thought was the base value of the property, i. e., "what it would cost to produce it at the present time new, without adding thereto any overhead charges." This figure he fixed at \$1,975,026. To this he added overhead charges, 15 per cent—\$296,254. From this he deducted depreciation, \$333,878, leaving as the value of the property thus ascertained, \$1,937,402. [Id., pp. 161-162.]

* * * That there is an element of value in an assembled and established plant, doing business and earning money, over one not thus advanced, is self-evident. This element of value is a property right, and should be considered in determining the value of the property, upon which the owner has a right to make a fair return when the same is privately owned although dedicated to public use. Each case must be controlled by its own circumstances, and the actual question here is: In view of the facts found, and the method of valuation used by him, did the master sufficiently include this element in determining the value of the property of this company for rate-making purposes? [Id., p. 165.]

As pointed out in the *Cedar Rapids Case*, if return is to be regarded beyond that compensation which a public service corporation is entitled to earn upon the fair value of its property, the right to regulate is of no moment, and income to which the corporation is not entitled would become the basis of valuation in determining the rights of the public. When, as here, a long established and successful plant of this character is valued for rate-making purposes, and the value of the property fixed as the master certifies upon the basis of a plant in successful operation, and overhead charges have been allowed for the items and in the sums already stated, it can not be said, in view of the facts in this case, that the element of going value has not been given the consideration it deserves and the appellant's contention in this behalf is not sustained. [Id., p. 171.]

The ruling in the *Des Moines Gas Case* concerning going value was followed by the Supreme Court in *Denver v. Denver Water Co.*, *supra*, in which the court said: "The master expressly declared that his detailed valuation of the physical property and water rights included no increment because the property constituted an assembled and established plant, doing business and earning money." A separate allowance for going value was included in the valuation of the water company's property, while no such separate allowance was made in the *Des Moines Gas Case*.

In the above sense the term "going value" is capable of concrete conception and definite ascertainment. However, there has been

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urged upon us a going value which is said to exist in addition to that here referred to, which apparently runs into sums of great magnitude, but which, in spite of its magnitude, is incapable of more than the most metaphysical and conjectural description on the part of those who advocate its inclusion as an element of value. It has been urged upon us on many successive occasions, but from the beginning it has been nothing but a vague claim. However, the owners of the Texas Midland have not received a fair return on their investment in this property. The operation of the road, as shown in Exhibit C and other data in Appendix 2 hereto, has resulted in frequent deficits. These deficits are not elements of value, but they are pertinent facts to be given consideration in a proper proceeding.

The requirements of the act in this regard have been fully complied with.

AIDS, GIFTS, GRANTS, AND DONATIONS.

Although the issue is not raised by any protest, upon the hearing the Railroad Commission of Texas asserted that the state of Texas had issued to the predecessor corporation of the Texas Midland certificates aggregating 1,800,000 acres of land of the public domain of that state, for the purpose of assisting the predecessor corporation in the building of this railroad. It was claimed that of those certificates a total of 1,471,000 acres were actually located and received by the predecessor corporation from the state and sold, and the proceeds have found their way into the treasury of the predecessor corporation. Assertion is made that the Texas Central Railway Company at that time owned a total of approximately 230 miles of track, of which approximately 52 miles was acquired by the Texas Midland in 1892.

Nothing in the record, or developed in our investigations, tends to show that any of the lands located by the Texas Central Railway Company were granted by the state of Texas on account of the 52 miles of the Northeastern branch acquired by the Texas Midland. The suggestion of a defect in the tentative valuation in this regard can not be taken as well grounded.

COMMISSIONER ATTCHISON, having been of counsel, did not participate in the disposition of this case.

ORDER.

Entered July 31, 1913.

This case having been duly heard and submitted by the parties, and full investigation of the matters and things involved having been had, and the Commission having on the date hereof made and filed a report containing its conclusions thereon, which report is hereby referred to and made a part hereof:

It is ordered, That, subject to the reservation hereinafter made, the following be, and it is hereby declared to be, the final valuation of Texas Midland Railroad as of June 30, 1914:

FINAL VALUATION, TEXAS MIDLAND RAILROAD.

Location and general description of property.—The railroad of the Texas Midland Railroad, hereinafter referred to as the carrier, is located entirely within the state of Texas. Its main line extends from Ennis to Greenville, a distance of 72.92 miles, and from Commerce to Paris, a distance of 37.629 miles, making a total main-line mileage of 110.549 miles. The carrier has no branch lines. The tracks of the St. Louis Southwestern Railway Company of Texas, between Greenville and Commerce, a distance of 13.97 miles, are used under a trackage arrangement to unite the two pieces of the Texas Midland Railroad above mentioned, and thereby establish a through operating line from Ennis to Paris, a distance of 124.519 miles. The carrier also has yards and sidetracks aggregating 37.302 miles. Its railroad embraces 147.851 miles of all tracks.

In Appendix 1 will be found a general description of the characteristics of the property of the carrier.

Jointly used property.—In Appendix 2 will be found a statement of the tracks and facilities leased from other companies.

The carrier owns and uses jointly with other common carriers railroad tracks as follows:

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One thousand one hundred and twenty linear feet of railroad at North Ennis, jointly owned by the carrier and the Houston & Texas Central Railroad, one-half each, and jointly used by such companies.

A connecting track, 962 linear feet in length, at Kaufman, Tex., jointly owned by the carrier and the Texas & New Orleans Railroad, one-half each, and jointly used by such companies.

Five tracks at Greenville, Tex., aggregating 2,617 linear feet, jointly owned by the carrier and the St. Louis Southwestern Railway Company of Texas, and the Missouri, Kansas & Texas Railway Company of Texas, one-third each, and jointly used by such companies.

Five sidetracks at Greenville, Tex., aggregating 5,760 linear feet, jointly owned by the carrier and the St. Louis Southwestern Railway Company of Texas, one-half each, and jointly used by such companies.

Traffic connections.—The railroad of the carrier connects with the Houston & Texas Central Railroad, at Ennis; the Texas & New Orleans Railroad, at Kaufman; Texas & Pacific Railway, at Terrell; the Missouri, Kansas & Texas Railway of Texas, and St. Louis Southwestern Railway Company of Texas, at Greenville; the St. Louis Southwestern Railway Company of Texas, at Commerce; and the St. Louis & San Francisco Railway Company, Paris & Mount Pleasant Railroad, Gulf, Colorado & Santa Fe Railway Company, and Texas & Pacific Railway, at Paris.

Physical conditions affecting construction.—In Appendix 1 appear statements as to the topography, geology, and climate as affecting the construction of the carrier's railroad.

Economic conditions relating to traffic.—The connections of the carrier's railroad with the lines of other common carriers have been stated. This road runs through a fertile agricultural country and has upon its lines several towns of considerable size. No mines and but little manufacturing are tributary to it.

In Appendix 1 is stated the percentage of the principal classes of freight carried over this railroad, and a comparison of the density of traffic of the carrier's railroad for the year 1914 with the density of traffic of all other railroads in Texas.

Corporate history.—The Texas Midland Railroad is owned and operated by a corporation also styled the Texas Midland Railroad, which was incorporated under the laws of Texas December 16, 1892, and has its principal office at Terrell in that state. The Texas Central Railroad Company had constructed, soon after its incorporation in 1879, a line of railroad extending from Garrett in a northerly direction through Midland Junction to Roberts, a distance of about 52 miles. This road was not connected with the main line of the

Texas Central, was known as the Northeastern branch, and will be designated in this report as the branch.

In 1891 the Texas Central Railway, including the branch, was sold under foreclosure proceedings to a committee acting for the boldholders. Mrs. Hetty R. Green owned 750 of these bonds and she subsequently made an arrangement by which the branch was transferred to her in lieu of her interest in the entire property and for other considerations. This arrangement by which she acquired the title to the branch was concluded in January, 1893, and soon afterwards the property was turned over to the Texas Midland Railroad, which had previously been organized for that purpose.

Soon after acquiring the branch the Texas Midland Railroad began the improvement of that piece of road and the construction of other pieces of road, all of which finally resulted in the present railway. The property assumed its present form about October 1, 1896, except that during the fiscal year ending June 30, 1908, the Texas Midland Railroad abandoned that portion of its line extending from Garrett to Midland Junction, 1.93 miles in length.

In Appendix 2 will be found a more detailed statement of the corporate history of which the foregoing are the salient facts.

History of corporate financing, capital stock, and long-term debt.—As a part of the transaction by which the Texas Midland Railroad acquired the branch the following stocks and bonds of that company were issued:

May 23, 1893, capital stock, par value.....	\$500,000
July 27, 1893, first mortgage 5 per cent betterment bonds, par value...	150,000
July 27, 1893, second mortgage 5 per cent purchase money bonds, par value	750,000
Total.....	1,400,000

As a part of the same transaction Mrs. Green conveyed to the Texas Midland Railroad the branch and paid to it \$75,000 in cash.

As already noted the Texas Midland Railroad soon after it acquired the branch proceeded to construct the remainder of its present railroad. The money for this purpose was furnished by Mrs. Green acting under the name, as to most transactions, of the Texas Midland Construction Company. In this way previous to August, 1908, she had advanced approximately \$1,746,931.33.

In August, 1908, the capitalization of the Texas Midland Railroad was recast by canceling 3,880 of the 5,000 shares of capital stock and by retiring all of the \$900,000 of bonds which had previously been issued. A new mortgage bearing interest first at the rate of $4\frac{1}{2}$ per cent, but subsequently at the rate of 4 per cent to the amount of \$2,000,000 was issued. This left the capitalization of that company as follows:

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Capital stock, par value.....	\$112,000
Mortgage indebtedness, 4 per cent.....	2,000,000
Total	2,112,000

The foregoing has ever since continued to be and now is the capitalization of the company.

At the time of the readjustment of the capitalization as above there was canceled of the indebtedness of the Texas Midland Construction Company all but \$500,000, which has never been paid and which constitutes a deferred liability of that amount and is really a part of the capitalization of the company.

Further details as to the matters embraced under this heading appear in Appendix 2.

Net and gross earnings of the carrier.—The results of the corporate operations of the carrier from February 26, 1893, when it opened its books and began to transact business, to and including June 30, 1914, are stated in detail in Appendix 2. These results are summarized as follows:

Gross earnings.....	\$9,939,298.80
Operating expenses.....	8,539,431.88
Leaving net earnings.....	1,399,866.92
During the same period taxes assessed against the Texas Midland aggregated.....	274,867.20
Leaving a net income of.....	1,125,499.72
To this should be added income from nonoperating sources of....	1,504.22
Making gross income for the period.....	1,127,003.94
During this period the Texas Midland paid rents and balance for hire of equipment.....	353,936.95
Leaving for the payment of interest and dividends during this period	773,066.99

General balance sheet.—The general balance sheet of the carrier, showing the result of its corporate operations to June 30, 1914, is as follows:

ASSETS.

Investments:	
Investment in road and equipment.....	\$2,748,171.46
Current assets:	
Cash	\$13,908.16
Net balance receivable from agents and conductors	4,324.03
Miscellaneous accounts receivable.....	16,395.34
Materials and supplies.....	82,943.24
Total current assets.....	117,570.77

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Unadjusted debits:

Preliminary survey, Greenville-Commerce line	\$444. 25
Freight claim account	2, 800. 29
Paid claims unadjusted	9, 668. 98
Total unadjusted debits	\$12, 913. 52
Total assets	2, 878, 655. 75

LIABILITIES.

Stock:

Capital stock	\$112, 000. 00
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Long term debt:

Funded debt unmatured	2, 000, 000. 00
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Current liabilities:

Loans and bills payable	\$20, 000. 00
Traffic and car service balances payable	18, 526. 69
Audited accounts and wages payable—	
Accounts payable	\$55, 742. 07
Pay check account	25, 231. 03
	80, 973. 10
Agents' drafts	1, 584. 13
Interest matured unpaid	300, 000. 00
Unmatured interest accrued	33, 333. 30
Total current liabilities	454, 417. 22

Deferred liabilities:

Hospital fund	682. 97
Due Texas Midland Construction Company	500, 000. 00
Total deferred liabilities	500, 682. 97

Unadjusted credits:

Accrued depreciation equipment	105, 168. 91
Other unadjusted credits	38, 849. 06
Total unadjusted credits	144, 017. 97

Corporate surplus:

Profit and loss (deficit)	332, 462. 41
Total liabilities	2, 878, 655. 75

Investment in road and equipment.—The details of the maximum amount of investment in road and equipment of the carrier, which includes noncarrier property, as stated in the records of the carrier at June 30, 1914, amounted to \$2,748,171.46. As appears in Appendix 2, certain adjustments have been made, as a result of which the maximum of the investment account has been restated at \$2,892,360.94, for road and equipment, including land.

Original cost to date.—The original cost to date of each piece of property could not be found with precision. From an examination of the books of the carrier it appears that \$2,892,360.94 somewhat

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exceeds the amount of money which could have been expended in the property. A statement of the manner in which this amount was arrived at, classified in conformity with the classification of expenditures for road and equipment, is included in the accounting report which is a part hereof and is attached hereto as Appendix 2.

The original cost of equipment in existence on valuation date was \$522,874.59; of carrier lands, \$67,493.44. Of this latter amount \$22,884.69 was expended by the carrier, while the balance, \$44,608.75, was expended by various donors.

Cost of reproduction new, and cost of reproduction less depreciation.—The cost of reproduction new and cost of reproduction less depreciation of property other than land wholly and partly owned and used by the carrier is \$3,461,356 and \$2,597,442, respectively. It is divided as follows:

Common-carrier property.

	Cost of reproduction new.	Cost of reproduction less depreciation.
Wholly owned and used.....	\$3,437,327	\$2,577,389
Jointly owned and used:		
With Missouri, Kansas & Texas Railway Co. of Texas and St. Louis Southwestern Railway Co. of Texas—one-third each; Texas Midland's portion..	1,822	1,272
With St. Louis Southwestern Railway Co. of Texas—one-half each; Texas Midland's portion.....	19,271	16,949
With Houston & Texas Central Railroad—one-half each; Texas Midland's portion.....	1,091	849
With Texas & New Orleans Railroad—one-half each; Texas Midland's portion.....	1,395	983
Total.....	3,461,356	2,597,442

These amounts classified in conformity with the classification of expenditures for road and equipment as prescribed by us are shown in the summary sheets which are a part of this report as Appendix 1.

Cost of lands, rights of way, and terminals at the time of their dedication to public use and present value of the same.—The cost of carrier lands, as accurately as it could be determined from the records, was found to be \$67,493.44, and the present value of the same \$254,034.99, divided as follows:

	Acres.	Original cost.	Present value.
Carrier lands purchased.....	1,422.057	\$22,884.69	\$180,715.75
Carrier lands donated.....	511.008	44,608.75	73,764.23
Total.....	1,933.065	67,493.44	254,479.98

The figure \$22,884.69, shown as the original cost of carrier lands purchased, represents actual expenditures as disclosed by the books
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of the companies. Our accountants were unable to locate all of the records of the company which contributed that part of the line from Ennis to Greenville.

Present cost of condemnation or purchase of lands.—Following the views previously expressed, no attempt is made to state what would be the present cost of acquiring, either by purchase or by condemnation, the lands of the carrier devoted to the public use.

Property held for purposes other than those of a common carrier.—The carrier owns 35.96 acres of land which are not devoted to transportation purposes. The original cost and present value of this land, respectively, is divided as follows:

	Acres.	Original cost.	Present value.
Noncarrier lands purchased.....	2.42	\$5,410.00	\$8,269.85
Noncarrier lands donated.....	33.54	3,165.00	5,105.40
Total.....	35.96	8,575.00	13,375.25

Aids, gifts, grants of right of way, and donations.—The right of way of the carrier was largely donated by citizens of Ennis, Greenville, Cooper, Commerce, and Paris, these being the principal towns which the road serves. For the most part these lands were purchased with money contributed by the citizens, the lands themselves being deeded to the railroad. Certain sums of money and other contributions, in effect aids and donations, were received by the carrier. These amounted to \$1,058,018.30, made up as follows:

Right-of-way lands	\$44,608.75
Nontransportation lands	3,165.00
Cash by citizens of five communities.....	19,981.46
Advances by individuals and companies on account of industrial tracks which are included in the reproduction cost of this property	1,130.30
Interest due bondholders canceled.....	121,249.96
Money advances by Texas Midland Construction Company apparently canceled.....	778,219.71
Equipment donated by Texas Midland Construction Company.....	88,681.17
Expenses, E. H. R. Green to St. Louis, chargeable against rails....	250.00
Freight charges on coal, donated by Mrs. Green, chargeable against ballast	731.95
Total.....	1,058,018.30

In addition to this, it should be noted that no interest was reckoned upon the advances of the Texas Midland Construction Company, and that since the settlement with that company in 1908, at which time these advances were reduced to \$500,000, no interest has

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been reckoned or paid upon that account. The accounting report in Appendix 2 explains these figures in detail.

The Texas Midland Railroad also occupies 16.42 acres of streets and alleys which have been vacated by municipal or other ordinances and the exclusive use given to it, the present value of which is \$10,403.40. This sum is included in the present value of lands, above stated.

Material and supplies.—As shown in the general balance sheet, the value of the material and supplies on hand is shown by the carrier's records to have been, upon valuation date, \$82,943.24. As adjusted by inventory of the materials and supplies on hand, this sum is increased to \$96,857.19. The difference between these sums has not been explained, and has not been taken into the carrier's records.

Other values and elements of value.—No other values or elements of value were found to exist.

Appendices.—Appended hereto as Appendix 1 are the summary sheets and explanatory text showing the classification of the cost of reproduction new and cost of reproduction less depreciation above set forth, in conformity with the classification of expenditures for road and equipment, exclusive of lands. Appendix 2 states the details as to the corporate and financial history, original cost to date, investment, capitalization, net and gross earnings, and expenditures of money and purposes for which expended, of the carrier. Appendix 3 is a statement of the methods employed, and of the reasons for the differences between the various cost values reported.

The engineering, land, and accounting reports give the details respecting these figures and are on file in the bureau of valuation of the Commission, open to public inspection, and subject to the direction of Congress, and such reports are referred to for greater particularity as to the matters herein stated.

This order will be supplemented by such further findings and order with respect to the value of the carrier property as may be deemed appropriate.

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APPENDIX 1.

EXPLANATORY TEXT.

Topography, geology, and climate.—The country traversed by the Texas Midland Railroad consists of rolling hills, interspersed with small depressions, no streams of any consequence being encountered except north of Ennis, where the Trinity River is crossed, and south of Greenville, where the Caddo River is crossed. The soil on the hills is a sandy loam, while in the bottoms, a black waxy material is encountered, which by some people is called "gumbo." There are no outcroppings of rock and very little rock or hard material was encountered in the construction of the roadbed. The average altitude of the territory traversed by the Texas Midland is 560 feet above sea level. The winters are mild, snowfall being light, and the period of low temperature is of brief duration. The average rainfall distributed throughout the year is 39 inches.

Density of traffic.—The following table with reference to freight traffic, is a statement of the percentage on the principal classes of freight carried by this road:

Year.	Grain.	Cotton.	Total products of agriculture.	Lumber.	Cement, brick, lime.	Bituminous coal.	All other classes.	Total.
1911.....	2.47	9.33	27.69	6.39	3.51	31.51	19.10	100
1912.....	6.34	15.98	40.26	5.87	3.08	26.22	4.25	100
1913.....	3.37	11.89	32.22	6.19	2.95	35.97	7.51	100

The density of traffic on the Texas Midland Railroad for the year 1914, compared with the density of traffic of all other railways in Texas, is shown in the following table:

Items.	Texas Midland Railroad.	All other railroads in Texas.
Number of revenue tons hauled 1 mile, per mile of road.....	161,008	199,777
Number of revenue passengers hauled 1 mile, per mile of road.....	66,900	33,818

Valuation sections.—The Texas Midland Railroad property consists of the following main and other track mileage, with their ap-

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purtenances, as given below in the general description of valuation sections:

Valuation section No. 1.—From survey station 0+00, being a rail monument 280 feet north of head block in the Houston & Texas Central Railroad's main track, south end of the yards at Ennis, Tex., to survey station 3,855+21, being 1,070 feet north of the center of the St. Louis Southwestern Railway of Texas' crossing at Greenville, being 72.920 miles of main line.

Valuation section No. 2.—1,120.9 linear feet of the north leg of the Y at North Ennis, of the Texas Midland Railroad and the Houston & Texas Central Railroad, its easterly end being 82 feet southwesterly from head block in the Texas Midland's main track at North Ennis. This track is jointly owned by the above-named companies, and each has a 50 per cent interest.

Valuation section No. 3.—The connecting track between the Texas Midland and the Texas & New Orleans Railroad, being 962 feet in length, located at Kaufman, Tex., commencing at the head block 1,486.3 feet north of the center of the railroad crossing of the above railroads. This track is jointly owned by the above-named railroads, and each has a 50 per cent interest.

Valuation section No. 4.—Five tracks at the Refining Company's plant at Greenville, Tex., which are jointly owned by the St. Louis Southwestern Railway Company of Texas, the Missouri, Kansas & Texas Railway Company of Texas, and the Texas Midland Railroad, each company owning one-third undivided interest. The total length of the tracks is 2,617 feet.

Valuation section No. 5.—Five sidetracks in Jordan Street, Greenville, Tex., and leading thereto, in which the St. Louis Southwestern Railway Company of Texas and the Texas Midland Railroad each own a one-half undivided interest. The total length of these tracks is 5,760 feet.

Valuation section No. 6.—Commences at survey station 3,877+22.5, being the head block in the St. Louis Southwestern Railway Company of Texas main track, 777.5 feet southwest of the center of the St. Louis Southwestern Railway of Texas and the Texas Midland Railroad crossing at Commerce, Tex., and extending to survey station 5,864+05.0 of the main track, 227 feet north of the south face of the freight depot at Paris, being 37.629 miles in length.

Unit prices.—The unit prices applied to the schedules of reproduction on the Texas Midland are the representative prices of railway property constructed or purchased by the usual methods of railway construction. For that class of property which is generally constructed under contract, the unit prices are representative of unit costs. Where property is first purchased direct from the manufacturer, or material is purchased from the manufacturer and installed by day labor, the unit prices are representative of unit costs.

In all instances as specified by the classification of accounts of the Interstate Commerce Commission, the unit prices represent the total cost of the item of property in place, which is for all expense incident thereto, including such profits as representative unit costs may contain.

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STATEMENT BY ACCOUNTS GIVING ANALYSIS OF UNIT PRICES AND
PRINCIPLES AND METHODS FOLLOWED.

Account No. 1, engineering.—It was assumed that the cost of this account would be an amount equal to 2½ per cent of Accounts Nos. 3 to 47, inclusive.

Account No. 3, grading.—The quantities of clearing and grubbing are estimated according to the extent of timber contiguous to the right of way as of the date of valuation.

The unit prices shown in the schedules of cost of reproduction are representative contract prices for work of this kind in the vicinity of northern Texas.

The grading quantities shown are the actual quantities measured in the field, plus an amount for shrinkage which is added to the embankment quantities. This additional amount is shown separately in the schedules of reproduction.

Clearing and grubbing, excavation and embankment quantities in the roadbed were given a service condition of 100 per cent.

Account No. 6, bridges, trestles, and culverts.—A bill of material of all trestles is shown for each valuation section, accompanied by a statement of their aggregate length.

The service condition for each individual trestle was established for the deck and for the substructure separately. Subsequently the service condition per cents for all trestles on a valuation section were compiled and a weighted average obtained.

The unit prices for pipe and box culverts are for all labor of installation, including excavation for foundation.

Account No. 8, ties.—The percentages of first-class and second-class ties were determined from the carrier's tie records.

The unit prices applied to cattle-guard, bridge, and switch ties are stated in amounts per 1,000 feet board measure, unloaded in company's material yard.

The service condition of ties was determined from statistical studies of the carrier's records, and the conclusion reached that the renewals had been normal, thus giving the ties a service condition of 50 per cent.

Account No. 9, rails.—The unit prices applied to new rails are upon the basis of 5 per cent being second class and 95 per cent being first class.

A study of the rail of the Texas Midland Railroad led to the conclusion that any rail in main-line track could be expected to have a total life of 40 years as new rail before becoming relay; that new rail laid in side tracks could be expected to have a life of 100 years before

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becoming scrap; and that relay rail would have a life of 60 years before becoming scrap.

The service condition was established for each of these cycles according to the age of the rail in each particular cycle. In order to do this it was necessary to ascertain the value of relay and scrap rail. Investigation led to the conclusion that relay rail of the Texas Midland Railroad had a net value of \$23.50 per gross ton and scrap rail a net value of \$9 per gross ton. The total gross tons of rail of each class were determined by the calculation of theoretical weights, not taking into account any loss due to wear.

Account No. 10, other track material.—The unit prices applied to the various items of property classified under this account are representative of commercial prices f. o. b. common points on the Texas Midland Railroad to which are applied the cost of unloading and inspection.

The unit prices on various items of property are shown in detail on the schedules of cost of reproduction.

Angle bars were given the same service condition assigned to the cycle of rail with which they were associated.

Account No. 11, ballast.—The ballast was secured from several sources and the prices applied depend upon where the ballast was used.

The burned-clay ballast used between Kaufman and Greenville was secured at the Kaufman pit and burned-clay ballast used between Commerce and Paris was secured at the Enloe pit.

The cost f. o. b. cars for cinders and sand includes only the expense of loading. In determining the final prices applied to cinders, it was assumed that all cinders would have an average haul on the basis that they were secured at Terrell.

No mortality tables or statistical data were available from which the service condition of the various classes of ballast could be estimated, and this was determined solely by observation.

Account No. 12, tracklaying and surfacing.—The unit price applied as shown in the schedules of cost of reproduction is representative of contract prices for work of this class in the vicinity of northern Texas.

Account No. 13, right-of-way fences.—The unit price applied to the various items of this account include the expense of installation. The service condition was determined by using the principles adopted by the engineering board.

Account No. 15, crossings and signs.—The unit price applied to property embraced in this account includes cost of installation and all other expenses incident thereto.

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Account No. 16, station and office buildings.—The costs of reproduction new and of reproduction less depreciation of station and office buildings were determined by applying unit prices to the various parts of the building.

The unit prices used for concrete masonry, rubble masonry, and excavation for foundations are representative contract prices for work in the vicinity of northern Texas.

Furniture and fixtures were found to be different for each building, and a unit price for each individual piece of furniture was established. Typewriters, adding machines, and similar items were considered furniture.

In establishing the service condition of buildings each was divided into a number of elements, as roof, outside walls, inside finish of outside walls, ceiling, partitions, floorings, openings, and foundations. The age of the different buildings was ascertained, which in general is the age of each element. Each element was carefully inspected, and a service condition was established, based upon the age and expected life, modified by actual observations.

Account No. 17, roadway buildings.—The costs of reproduction new and of reproduction less depreciation of roadway buildings were established by the same methods as used in Account 16, station and office buildings.

Account No. 18, water stations.—In obtaining the costs of reproduction new and of reproduction less depreciation of buildings for water stations, the same methods were used as for Account 16, station and office buildings. The unit prices applied to wells of various sizes are based upon the representative prices of contract work in the vicinity of northern Texas.

Account No. 19, fuel stations.—There is only one structure, which is located at Paris, coming under this account. This structure, being very similar to frame trestles, the costs of reproduction new and of reproduction less depreciation were determined by the same methods as used for timber trestles in Account 6, bridges, trestles, and culverts.

Account No. 20, shops and engine houses.—The costs of reproduction new and of reproduction less depreciation of shops and engine houses were established by the same method as used in Account 16, station and office buildings.

Account No. 26, telegraph and telephone.—The only property which the Texas Midland owns under this account is a private telephone line from the general office to the machine shops at Terrell. A detailed bill of material is shown in the schedules of cost reproduction.

The unit prices applied are the average of commercial prices in the vicinity of northern Texas. The whole amount of the property

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being so small, the service condition was determined solely from observation, no attempt being made to apply mortality tables.

There are included in the cost of reproduction the expenditures the Texas Midland incurred building the Western Union Telegraph lines.

Account No. 27, signals and interlockers.—The price applied to interlockers was based upon representative contract prices for interlockers of similar character installed complete.

In determining the cost of reproduction new and the cost of reproduction less depreciation of buildings, coming under this account, the same methods were used as set forth in Account 16, station and office buildings.

Account No. 29, power-plant buildings.—In determining the cost of reproduction new and the cost of reproduction less depreciation of buildings, the same methods were used as set forth in Account 16, station and office buildings.

Account No. 32, power distribution system.—The items of property coming under this account are but small in value. The unit prices determining the cost of reproduction are commercial prices for property of these classes plus the cost of installation.

Account No. 35, miscellaneous structures.—Under this account have been classified ways for unloading telegraph poles and bridge timbers at Terrell, Tex., cost of reproduction new being \$84, and the cost of reproduction less depreciation, \$29.

Account No. 37, roadway machines.—The aggregate of property classified under this account is small, amounting to only \$2,306, the items of which with prices applied are shown in detail, in the schedules of cost of reproduction.

Account No. 38, roadway small tools.—The property under this account is made up of numerous items. The service condition was determined by observation, the conclusion being reached that the small roadway tools were in a service condition per cent slightly above the average, the amount applied being 55 per cent.

Account No. 39, assessments for public improvements.—The carrier's records showed that assessments aggregating \$9,826.78 had been made against it for public improvements, which have not been included in the schedules of reproduction or the summaries thereof.

Account No. 40, revenues and operating expenses during construction.—The construction program adopted did not contemplate that there would be any revenues which would be classified under this account.

Account No. 41, cost of road purchased.—The Texas Midland purchased that part of its line from Garrett, Tex., to Roberts, Tex., which transaction and the amounts have been fully set forth in

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Appendix 2. The physical property of this part of the road has been inventoried and classified under the proper accounts and shown in the schedules of cost of reproduction.

Account No. 42, reconstruction of road purchased.—The statement under Account 41, cost of road purchased, is applicable to reconstruction of road purchased.

Account No. 43, other expenditures, road.—To provide for the expense of freight, over the line of the road during construction, and similar miscellaneous items, an amount of \$50 per mile of main track was estimated as sufficient.

Account No. 44, shop machinery.—Each machine or piece of equipment of any consequence is listed separately with the unit price applied, which price includes the foundation and installation. Small hand tools, numerous but of small individual value, were individually priced, then grouped, and only the totals for groups are shown on the schedules of cost of reproduction. The service condition for machinery and equipment was determined by actual observation, having in mind the age and the expected service life. The service condition of small hand tools and other similar property was generally considered as 50 per cent.

Account No. 45, power-plant machinery.—The property under this account was treated in the same manner as Account No. 44, shop machinery and tools.

Account No. 51, steam locomotives.—Each locomotive was inspected for the purpose of identifying the property and making observations as to additions and betterments which have been applied since the locomotive was originally purchased. The unit prices applied are representative prices of locomotives of each class, and include the freight from the locomotive works, also the cost of tool equipment, setting up, and breaking in. The locomotives which were purchased secondhand were given a "cost of reproduction new" at the secondhand price, which was subsequently depreciated.

Account No. 53, freight-train cars.—All freight-train cars were inspected to establish their existence and service condition. Prior to the beginning of this inspection the carrier was asked to furnish a list of its freight equipment, which was used as a guide for the inspection. It was ultimately found that this list of equipment was in error 22½ per cent, which error was definitely established and acknowledged by the carrier. Among other things which brought about this error were: (a) A number of cars reported by the carrier did not exist; (b) cars were in existence of which the carrier had no record; and (c) two or more cars in existence carried the same number.

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The unit prices applied to freight-train cars are representative prices paid by carriers for equipment of the various classes in the vicinity of northern Texas, which include freight from the factory. Nothing is included for design, engineering, or inspection, excepting that which was incurred by the manufacturer and is included in the original price.

Account No. 54, passenger-train cars.—All passenger-train cars were inspected to determine their existence and their service condition.

The unit prices applied are representative of those paid by carriers in the vicinity of northern Texas, including the freight from the factory. Nothing is included for design, engineering, or inspection, excepting that incurred by the manufacturer and included in the original price.

Account No. 55, motor equipment of cars.—The Texas Midland owns two motor passenger cars, which are used in suburban service. The equipment was practically new and the service condition was determined by actual observation.

The equipment for these two cars coming under this account was included in the contract price paid for the cars as a whole and the unit price applied to this equipment was based upon those contracts. The reporting of all the expense for these cars under this account is not in exact conformity with the classification of accounts. That part of the equipment such as trucks and body of the car should be classified under Account 54, passenger-train cars, but because of the impracticability of separating the costs of the various parts of the cars, these costs are shown in their entirety under this account.

Account No. 57, work equipment.—The property under this account was inspected to establish the existence of the property. The unit prices applied are representative of the prices paid by the carrier for property of this class, including freight from the factory. Nothing has been included for design, engineering, or inspection, excepting that incurred by the manufacturer and included in the original price.

Account No. 71, organization expenses; Account No. 72, general officers and clerks; Account No. 73, law; Account No. 74, stationery and printing; Account No. 75, taxes; and Account No. 77, other expenditures, general.—It was assumed that these accounts would be an amount equal to $1\frac{1}{2}$ per cent of the road accounts, except Account 2, land for transportation purposes.

Account No. 76, interest during construction.—It has been assumed that this account would be an amount equal to 6 per cent per annum for 10 months or one-half the construction period, 7 months, plus 3 months upon the road and general expenditure accounts, ex-

cepting Accounts No. 2 and No. 76; plus 6 per cent for 3 months upon the equipment accounts.

Jointly owned property.—The Texas Midland Railroad owns jointly with other carriers the following property, of which schedules of reproduction have been prepared and are included as a part of the Texas Midland report. These jointly owned properties are as follows:

Val. Sec.	Joint owner.	Total for joint property.		
		Texas Midland's proportion ratio to total.	Cost of reproduction new.	Cost of reproduction less depreciation.
		<i>Per cent.</i>		
T. M., 2-T.....	Houston & Tex. Cent. R. R.....	50	\$2,182	\$1,698
T. M., 3-T.....	Texas & N. O. R. R.....	50	2,789	1,966
T. M., 4-T.....	Mo. Kans. & Texas R. R. & St. L. & S. W. Ry.....	33½	5,465	3,815
T. M., 5-T.....	St. L. & S. W. Ry.....	50	39,441	33,897

GENERAL SUMMARY.

The costs of reproduction new and of reproduction less depreciation of the property of the Texas Midland Railroad are shown in the following general summary:

	Cost of reproduction new.	Cost of reproduction less depreciation.
Wholly owned by Texas Midland R. R.....	\$3,437,327	\$2,577,389
T. M., 2-T: Jointly owned with Houston & Texas Central R. R.; Texas Midland's proportion 50 per cent.....	1,091	849
T. M., 3-T: Jointly owned with the Texas & New Orleans R. R.; Texas Midland's proportion 50 per cent.....	1,395	983
T. M., 4-T: Jointly owned with the Missouri, Kansas & Texas Ry. Co. of Tex., and the St. Louis Southwestern Ry. Co. of Tex.; Texas Midland's proportion 33½ per cent.....	1,822	1,272
T. M., 5-T: Jointly owned with St. Louis & Southwestern Ry. Co. of Tex.; Texas Midland's proportion 50 per cent.....	19,721	16,949
Texas Midland's proportion of jointly owned property.....	24,029	20,053
Grand total for Texas Midland R. R.....	3,461,356	2,597,442

Noncarrier property.—Near Roberts, Tex., about 900 feet east of survey station 228 on what was formerly the right of way of the line leading from Garrett to Roberts, is an old depot approximately 20 by 44 feet, which is still owned by the Texas Midland Railroad, but leased to a farmer as a barn. It was estimated that the cost of reproduction new of this building would be \$642, and of reproduction new less depreciation, \$64.

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At Commerce, Tex., near survey station 3880 is located a one-story frame cottage 16 by 28 feet, which was included in the purchase of right of way at the time the road was built. However, as far as information is available, this cottage has never been used for transportation purposes but has always been rented as a residence. It was estimated that the cost of reproduction new of this cottage would be \$1,063, and of reproduction less depreciation, \$638.

Neither of the above structures is shown in the schedules of reproduction or included in the summaries thereof.

SUMMARY.

A.—Wholly owned and used for the purposes of a common carrier.

Acct.	Classes.	Cost of reproduction of road and equipment.	
		New.	Less depreciation.
I. ROAD.			
1	Engineering.....	\$58,773	\$58,773
2	Grading.....	411,886	411,491
6	Bridges, trestles, and culverts.....	387,792	289,461
8	Ties.....	281,112	140,557
9	Rails.....	525,134	434,206
10	Other track material.....	103,295	66,944
11	Ballast.....	227,255	181,804
12	Track laying and surfacing.....	239,631	173,413
13	Right-of-way fences.....	48,443	33,911
15	Crossings and signs.....	29,566	23,217
16	Station and office buildings.....	109,319	79,966
17	Roadway buildings.....	27,004	17,491
18	Water stations.....	30,428	23,267
19	Fuel stations.....	7,675	5,383
20	Shops and engine houses.....	68,155	51,447
26	Telegraph and telephone lines.....	8,715	5,863
27	Signals and interlockers.....	9,834	7,619
29	Power-plant buildings.....	6,474	5,308
32	Power-distribution systems.....	1,867	1,253
35	Miscellaneous structures.....	84	29
37	Roadway machines.....	2,306	1,404
38	Roadway small tools.....	2,295	1,263
43	Other expenditures—road.....	5,528	4,091
44	Shop machinery.....	57,333	41,430
45	Power-plant machinery.....	21,009	15,134
Total, 1, and 3 to 45, inclusive.....		2,670,912	2,072,723
II. EQUIPMENT.			
51	Steam locomotives.....	187,928	107,643
53	Freight-train cars.....	190,432	120,423
54	Passenger-train cars.....	73,455	39,236
55	Motor equipment of cars.....	57,020	33,789
57	Work equipment.....	73,236	41,869
Total, 51 to 57, inclusive.....		582,071	362,940
III. GENERAL EXPENDITURES.			
71	Organization expenses.....	40,064	31,091
72	General officers and clerks.....		
73	Law.....		
74	Stationery and printing.....		
75	Taxes.....	144,280	110,635
76	Interest during construction.....		
Total, 71 to 76, inclusive.....		184,344	141,726
Grand total, 1, and 3 to 76, inclusive.....		3,437,327	2,577,389

B.—Jointly owned and used with Houston & Texas Central Railroad, one-half each; 0.212 mile, valuation section T. M., 2-T.

Acct.	Classes.	Cost of reproduction.	
		New.	Less depreciation.
1	Engineering.....	\$45	\$45
3	Grading.....	190	190
6	Bridges, trestles, and culverts.....	140	105
8	Ties.....	393	197
9	Rails.....	850	722
10	Other track material.....	107	86
12	Tracklaying and surfacing.....	193	143
15	Crossings and signs.....	129	106
	Total, 1 and 3 to 15, inclusive.....	2,047	1,594
71	Organization expenses.....		
72	General officers and clerks.....		
73	Law.....	31	24
74	Stationery and printing.....		
75	Taxes.....		
77	Other expenditures, general.....		
76	Interest during construction.....	104	80
	Total, 71 to 77, inclusive.....	135	104
	Grand total, 1, and 3 to 77, inclusive.....	2,182	1,698
	Texas Midland's portion.....	1,091	849

C.—Jointly owned and used with Texas & New Orleans Railroad, one-half each; 0.182 mile, valuation section T. M., 3-T.

Acct.	Classes.	Cost of reproduction.	
		New.	Less depreciation.
1	Engineering.....	\$58	\$58
3	Grading.....	312	312
6	Bridges, trestles, and culverts.....	617	388
8	Ties.....	441	221
9	Rails.....	521	452
10	Other track material.....	359	203
11	Ballast.....	37	30
12	Tracklaying and surfacing.....	272	182
	Total, 1 and 3 to 12, inclusive.....	2,617	1,846
71	Organization expenses.....		
72	General officers and clerks.....		
73	Law.....	39	27
74	Stationery and printing.....		
75	Taxes.....		
77	Other expenditures, general.....		
76	Interest during construction.....	133	93
	Total, 71 to 77, inclusive.....	172	120
	Grand total, 1 and 3 to 77, inclusive.....	2,789	1,966
	Texas Midland's portion.....	1,395	983

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D.—Jointly owned and used with the Missouri, Kansas & Texas Railway Co. of Texas and St. Louis Southwestern Railway Co. of Texas, one-third each; 0.496 mile, valuation section T. M., 4-T.

Acct.	Classes.	Cost of reproduction.	
		New.	Less depreciation.
1	Engineering	\$113	\$113
3	Grading	163	163
6	Bridges, trestles, and culverts	921	552
8	Ties	753	377
9	Rails	1,450	1,210
10	Other track material	872	401
11	Ballast	246	197
12	Tracklaying and surfacing	775	543
15	Crossings and signs	35	26
	Total, 1, and 3 to 15, inclusive	5,128	3,682
71	Organization expenses	77	53
72	General officers and clerks		
73	Law		
74	Stationery and printing		
75	Taxes		
77	Other expenditures, general	260	180
76	Interest during construction		
	Total, 71 to 77, inclusive	337	233
	Grand total, 1, and 3 to 77, inclusive	5,465	3,815
	Texas Midland's portion	1,822	1,272

E.—Jointly owned and used with St. Louis Southwestern Railway of Texas, one-half each; 1.091 miles, valuation section T. M., 5-T.

Acct.	Classes.	Cost of reproduction.	
		New.	Less depreciation.
1	Engineering	\$814	\$814
3	Grading	2,027	2,027
6	Bridges, trestles, and culverts	493	350
8	Ties	1,875	938
9	Rails	3,543	3,019
10	Other track material	1,072	713
11	Ballast	707	566
12	Tracklaying and surfacing	1,513	1,104
15	Crossings and signs	2,038	1,485
16	Station and office buildings	18,146	16,294
18	Water stations	4,790	4,603
	Total, 1 and 3 to 18, inclusive	37,006	31,813
71	Organization expenses	555	475
72	General officers and clerks		
73	Law		
74	Stationery and printing		
75	Taxes		
77	Other expenditures, general	1,878	1,609
76	Interest during construction		
	Total, 71 to 77, inclusive	2,433	2,084
	Grand total, 1 and 3 to 77, inclusive	39,441	33,897
	Texas Midland's portion	19,721	16,949

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APPENDIX 2.**INTRODUCTORY.**

Previous to 1891 the Texas Central Railway Company had constructed a line of railroad from Garrett to Roberts, both in the state of Texas. This line was 52.06 miles in length, was not connected with the main line of the Texas Central, and was commonly known as the Northeastern branch.

In 1891 the property of the Texas Central Railway Company, including this branch, was sold at foreclosure sale to a committee acting for the bondholders of that company. Mrs. Hetty R. Green, who owned a considerable number of these bonds, subsequently to the sale made an arrangement with the other bondholders by which her bonds were to be exchanged for the Northeastern branch. The Texas Midland Railroad was organized by her for the purpose of taking over, extending, and operating this 52 miles of railroad which she thus acquired.

The conveyance of this property was finally made by the bondholders' committee directly to the Texas Midland Railroad at the request of Mrs. Green. She furnished the money for the subsequent development of the property.

CORPORATE HISTORY.

Texas Midland Railroad, that being the full name, is a corporation of Texas with its principal office at Terrell in that state and was incorporated December 16, 1892. In February, 1893, it began the operation of its railroad, although the formal conveyance of the Northeastern branch does not seem to have been perfected until the following May. Since February, 1893, this corporation has continued to operate the Texas Midland Railroad. No other corporations are involved in the history of this property.

CONSTRUCTION.

The Texas Midland Railroad at once proceeded to improve and extend its railway, and in the course of these operations constructed three pieces of railroad.

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1. The southern terminus of the Northeastern branch had formerly been at Garrett, but Ennis was now made the southern terminus and a piece of railroad 4.619 miles in length was built from Ennis to Midland Junction, 1.93 miles north of Garrett. In 1896 the old line from Midland Junction to Garrett was abandoned.

2. From Roberts, originally the northern terminus of the Northeastern branch, the road was extended to Greenville, a distance of 18.766 miles.

3. A new line was constructed from Commerce to Paris, 37.629 miles in length.

The first two of these extensions were opened for business in 1894; the last about October 1, 1896. The distance from Greenville to Commerce is approximately 14 miles, and the Texas Midland Railroad uses between these points under a trackage arrangement the line of the St. Louis Southwestern Railway Company of Texas, thereby obtaining a through operating line from Paris upon the north to Ennis upon the south about 125 miles long.

CAPITALIZATION.

On January 27, 1893, the purchasing trustees executed a deed of the Northeastern branch to the Texas Midland Railroad, which was recorded on April 4, 1893, and was delivered to the Texas Midland Railroad on May 23, 1893, at the request of Mrs. Green. On the same date the Texas Midland Railroad voted to issue to Mrs. Green \$500,000 of its paid-up capital stock and \$750,000 of its 5 per cent bonds.

The company also issued to Mrs. Green \$150,000 of 5 per cent betterment bonds, which were secured by a first mortgage upon the property, and Mrs. Green upon her part paid to the company \$75,000 in cash. As a result of these transactions the capitalization of the company stood as follows:

May 23, 1893, 5,000 shares capital stock, par value.....	\$500,000
July 27, 1893, first mortgage 5 per cent betterment bonds, par value	150,000
July 27, 1893, second mortgage 5 per cent purchase money bonds, par value.....	750,000
Total	1,400,000

The laws of Texas then provided and still provide that a railway company shall not issue stocks and bonds in excess of the value of its property, as determined by the railway commission of that state. In 1895, the Texas commission valued the property of the Texas Midland Railroad then in existence, and in 1901 it valued the additions to that property which had been made subsequently to its first valuation.

tion, and at the same time readjusted the value of its equipment. The total value as thus established slightly exceeded \$2,112,000. Included in this sum is the value of 1.93 miles of road between Midland Junction and Garrett which was abandoned in 1896. The amount applicable to the abandoned line was shown of record to be \$19,277.54. Our accounting rules require that the ledger value of retired property be credited to the investment account upon its retirement, and if the ledger value of the retired property be not separately shown a proportionate share of the ledger value of the property of which it is a part should be credited.

In 1908, the capitalization of the Texas Midland Railroad was recast. Of the 5,000 shares of capital stock outstanding 3,880 were canceled, leaving 1,120 shares outstanding. All of the original \$900,000 of bonds were retired and new mortgage bonds, bearing interest first at the rate of $4\frac{1}{2}$ per cent, but subsequently at the rate of 4 per cent, were issued to the amount of \$2,000,000. This left the capitalization of that company as follows:

Capital stock, par value.....	\$112, 000
Mortgage indebtedness, 4 per cent, par value.....	2, 000, 000
Total	2, 112, 000

The foregoing has ever since continued to be and was the capitalization of the company at June 30, 1914.

It will be subsequently noted that the money for the development of this property was furnished by Mrs. Green, for the most part under the name of the Texas Midland Construction Company. At the time of the recasting of the capitalization as above, and apparently as a part of that transaction, the indebtedness of the Texas Midland Railroad to the Texas Midland Construction Company was canceled except for the amount of \$500,000, which is still outstanding and which constitutes a deferred liability in that amount and is really a part of the capitalization of the company.

AMOUNTS REALIZED FROM THE SALE OF SECURITIES.

The entire first issue of stocks and bonds as given above, aggregating \$1,400,000, was delivered to Mrs. Green, who in consideration therefor delivered the deed to the Northeastern branch to the Texas Midland Railroad and paid to it \$75,000 in cash.

The value of this 52 miles of railroad at the date of conveyance is not known. The amount expended in its construction, as shown by the records of the Texas Central Railway Company, aggregates \$550,987.15.

Mrs. Green was the owner of 750 bonds of the par value of \$1,000 each out of a total issue of 3,999 bonds against the Texas Central.

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Her pro rata share of the amount received from the foreclosure sale, less the expenses of said sale and certain necessary payments, was \$113,527.50. She surrendered her 750 bonds and paid the purchasing trustees for the bondholders \$75,000 in cash for the Northeastern branch.

As a part of this arrangement, Mrs. Green received a conveyance of certain lands not belonging to the Northeastern branch and assumed certain contingent liabilities. It can not be determined whether the net result of these collateral transactions was in favor of or against Mrs. Green, but they were insignificant in amount and may be disregarded.

There is nothing in the records of the Texas Midland Railroad to show what Mrs. Green paid for her 750 bonds nor when she paid it, nor what, if anything, she had previously received on account of said bonds.

If it be assumed that the price at which the property of the Texas Central Railroad Company sold under foreclosure was the real value of the property itself, and that the bargain between Mrs. Green and her fellow bondholders was a fair one, then Mrs. Green paid for her \$1,400,000 of securities \$188,527.50 in property and \$75,000 in cash. In fact, there seems to be no reason for assuming that the above amount did represent the actual value of the property transferred by Mrs. Green to the Texas Midland Railroad, and it can only be affirmed that she paid for these securities a rather poor railroad 52 miles long and \$75,000 in money.

As already stated, the Texas Midland Railroad improved that portion of its railroad which it received from Mrs. Green and also constructed three pieces of new line. The money with which these expenditures were made was furnished by Mrs. Green, mostly in the name of the Texas Midland Construction Company, but partly through the Chemical National Bank of New York City. The total advances made by her in the name of the construction company previous to August, 1898, were \$1,658,762.90, but of this \$116,481.81 had been returned in cash and materials, leaving a net advance through that company of \$1,542,281.09. The advances made through the Chemical National Bank were \$88,168.43.

When the capitalization was recast in 1908 the stock which was canceled and the old bonds which were retired were delivered by Mrs. Green to the company, which in turn delivered to her the \$2,000,000 of new 4 per cent bonds. No evidence exists of any agreement or arrangement between Mrs. Green and the company with respect to this transaction except the entries upon the books of the Texas Midland Railroad itself. From them it would appear that the \$2,000,000 in bonds was used to retire the \$388,000 of capital stock, the \$900,000

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of old bonds, to extinguish the debt of \$88,168.43 due Mrs. Green for advances through the Chemical National Bank, to pay upon the debt due the Texas Midland Construction Company \$264,061.38, and to adjust \$359,770.19 of interest due bondholders. This would leave due the Texas Midland Construction Company \$1,278,219.71, of which \$778,219.71 appears to have been canceled, leaving an indebtedness of \$500,000 to that company or Mrs. Green.

In this adjustment no interest whatever was reckoned upon the advances of the Texas Midland Construction Company or the Chemical National Bank.

In 1899 the Texas Midland Construction Company paid \$88,681.17 for 100 box cars which were delivered to the Texas Midland Railroad. It would appear therefore that the total cash payments into the treasury of this company in consideration of its stocks and bonds have been:

Account first mortgage bonds.....	\$75,000.00
Through the Texas Midland Construction Co.....	1,542,281.09
Through the Chemical National Bank.....	88,168.43
On account of box cars.....	88,681.17
Total.....	1,794,130.69

The company never has paid any dividends upon its capital stock, nor has any interest ever been paid upon the \$500,000 left due on account of advances by the construction company in the adjustment of 1908. It has paid interest upon its bonds aggregating in all \$334,596.26.

GROSS AND NET EARNINGS.

The Texas Midland Railroad opened its books and began to transact business on February 26, 1893. From that date to and including June 30, 1914, its gross earnings from operation and its operating expenses were:

Gross earnings (railway operating revenues).....	\$9,939,298.80
Operating expenses (railway operating expenses)...	8,539,431.88
Leaving net earnings (net revenue from railway operation).....	1,399,866.92
During the same period taxes assessed against the Texas Midland aggregated (railway tax accruals)...	274,367.20
Leaving a net income of (railway operating income).....	1,125,499.72
To this should be added income from nonoperating sources of (nonoperating income).....	1,504.22

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Making gross income for the period (gross income).....	\$1, 127, 003. 94
During this period the Texas Midland accrued for rents, hire of equipment, and interest on unfunded debt (chargeable to deductions from gross in- come).....	357, 094. 74

Leaving for the payment of interest and dividends during this period (also chargeable to deduc- tions from gross income).....	769, 909. 20
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The details from which the above statement is summarized appears in Exhibit C, which is subjoined to this appendix. An attempt was made to rewrite the books of the Texas Midland from their inception down to June 30, 1914, in accordance with our present accounting rules. The figures which appear in Exhibit C are those obtained by our accountants through this process of revision and are not the figures which stand upon the books of the carrier.

The Texas Midland Railroad received, as subsequently appears in more detail, certain donations of money and of operative lands which had been purchased on its account with money donated and which are treated as equivalent to the money paid for them, aggregating \$66,702.46.

The foregoing sums, viz, the amounts paid in by Mrs. Green, the donations, the net corporate income, and \$20,000 received on notes, are apparently all that this company had received from its inception down to June 30, 1914, with which to construct its property and to pay interest and dividends. It did pay in interest, as already noted, the sum of \$334,596.26, the balance being used in the construction and development of the property and for the acquisition of other assets. The maximum available for the construction of the property would therefore be \$2,973,528.12, made up as follows:

Cash from Mrs. Green.....	\$1, 794, 130. 69
Net income from operation.....	\$769, 909. 20
Add depreciation charges included in expenses	99, 303. 04
	869, 212. 24
Donations of land and cash.....	66, 702. 46
Net proceeds from sale of notes.....	20, 000. 00
Expenditures of the Texas Central Railway upon the Northeastern branch.....	550, 987. 15
Appraised value of equipment which came to the Midland with the Northeastern branch of the Texas Central Railway.....	21, 000. 00
	3, 322, 032. 54

Less:		
Interest paid.....	\$334,596.26	
Cash on hand June 30, 1914.....	13,908.16	
		348,504.42
Total.....		2,973,528.12

INVESTMENT IN ROAD AND EQUIPMENT.

The investment in road and equipment as stated in the records of the Texas Midland Railroad at June 30, 1914, amounted to \$2,748,171.46, but this sum includes \$1,250,000 in securities issued to Mrs. Green in consideration of the transfer of the Northeastern branch of the Texas Central Railway and the payment to the purchasing trustees of \$75,000 in cash.

It became evident that the investment account of this carrier had not been correctly kept and an attempt was made to restate that account in accordance with our accounting rules now in force. For this purpose the entire books of the Texas Midland Railroad were in effect rewritten, every voucher being examined and reassigned as far as possible.

While the work of rewriting the accounts of this carrier as above was enormous, the result was in no way satisfactory and can be accepted only as a maximum. It was frequently impossible to determine whether the expenditure covered by a particular voucher was devoted to operation or represented a betterment to the property. Again, while it was usually possible to identify charges covering additions to the property, it was not possible to determine to the same extent retirements nor to determine the amount to be deducted from the investment account on account of such retirements, except with respect to 1.93 miles of road between Midland Junction and Garrett, which was abandoned in 1896, which amount has been determined.

This carrier expended about \$2,200,000 in rehabilitating the 52 miles purchased, constructing about 60 miles of new extensions, including subsequent additions and betterments to its entire line, and for equipment. It is possible that some part of this amount which was expended in rehabilitating the purchased mileage should have been charged to operating expenses, but the records did not permit of the division being made.

In rewriting the accounts of the Texas Midland Railroad it was found that numerous items of expenditure were erroneously classified. Items were found in the investment account that have been excluded in making our adjustments, while other items have been added that have improperly been charged to other accounts. As a result of these

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adjustments the maximum of the investment account has been restated at \$2,892,360.94, which sum is represented by the following expenditures:

Expenditures by the Texas Central Railway-----	\$550,987.15
Appraised value of equipment transferred by the Texas Central Railway to the Texas Midland Railroad -----	21,000.00
Expenditures by the Texas Midland Railroad and Texas Midland Construction Co.-----	2,214,890.91
Expenditures by Mrs. Green and others-----	124,760.42
	2,911,638.48
Deduction for 1.93 miles abandoned-----	19,277.54
Total investment in road and equipment (maximum)-----	2,892,360.94

A summary of the items embraced in the adjustment of this account will be found in Exhibit A.

ORIGINAL COST TO DATE.

The original cost to date of each piece of property owned by the Texas Midland Railroad can not be ascertained from available records. In lieu of an exhibit of that kind, it was possible to compile data which show that the amount of money expended upon its property did not exceed \$2,892,360.94. This figure must not be accepted as representing the precise original cost of its existing property, as it may include the cost of other retired property which could not be identified in the accounts. It also includes some expenditures incurred in rehabilitating the 52 miles of the Texas Central Railway which should, properly speaking, have been charged to operating expenses as renewals. It is, therefore, stated as a maximum.

A division of the sum designated as maximum expenditures among the three general classes of expenditures is:

Road -----	\$2,368,828.00
Equipment -----	522,874.59
General expenditures -----	658.35
Maximum expenditures-----	2,892,360.94

A distribution of this sum between the Texas Central Railway, the Texas Midland Railroad, and donations, as well as by primary accounts, will be found in Exhibit B.

Equipment.—So far as determinable from the records of the company the original cost to date of the equipment of the Texas Midland Railroad now on hand is given below by classes:

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Class.	No. of units.	Cost.
Steam locomotives.....	17	\$180,547.84
Freight-train cars.....	246	165,771.55
Passenger-train cars, including motor equipment.....	18	116,595.45
Work equipment.....	55	59,959.75
Total.....	336	522,874.59

Box car No. 1894 (galvanized sides and roof), included in freight-train cars reproduction cost, is not included in original cost, as it could not be ascertained whether this car had been built at the company's shops and the cost thereof charged to operating expenses, or whether it had been donated; no record of the cost of the car could be found in the accounts.

It should be carefully noted that the above figures do not purport to be original cost to date, but simply the original purchase price plus such other items of cost incurred at that time as appeared upon the books of the carrier, together with such expenditures for improvements as could be allocated.

AIDS, GIFTS, GRANTS, AND DONATIONS.

The following is a summary of the cash, land, and other values donated to the Texas Midland Railroad:

Cash subsidies by citizens of five communities.....	\$19,981.46
Right-of-way lands donated.....	44,608.75
Nontransportation lands donated.....	3,165.00
Equipment donated by Texas Midland Construction Co.	88,681.17
Interest due bondholders canceled.....	121,249.96
Money advances by Texas Midland Construction Co., obligations to repay canceled.....	778,219.71
Donations by individuals and companies account spur tracks	1,130.30
Other donations	981.95

Total aids, gifts, grants, and donations..... 1,058,018.30

Cash subsidies.—Five communities along the line of the Texas Midland Railroad, as an inducement to the carrier to extend and construct its line to and through those communities, volunteered not only to secure the right of way for the carrier, but also to contribute certain sums in cash. The sums which it was agreed would be contributed were not in all cases received, the amounts actually contributed being as follows:

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Citizens of Ennis, Tex.....	\$5,963.25
Citizens of Greenville, Tex.....	3,000.00
Citizens of Paris, Tex.....	5,000.00
Citizens of Cooper, Tex.....	5,018.21
Citizens of Commerce, Tex.....	1,000.00
Total	19,981.46

Right-of-way lands.—In addition to the cash subsidies which the foregoing communities agreed to contribute to the carrier, they also obligated themselves to secure lands for right of way and other purposes for the carrier, through the counties in which those communities were located, free of all cost to the carrier. Deeds enumerating a cost of \$47,773.75 were found in evidence for which no record of payment could be located in the accounts of the carrier. This amount is apportioned as follows:

Right-of-way lands.....	\$44,608.75
Nontransportation lands.....	3,165.00
Total	47,773.75

Equipment.—One hundred box cars were purchased for the Texas Midland Railroad and paid for by the Texas Midland Construction Company. The cost of this equipment was \$86,500, less 1 per cent, and an additional sum of \$3,046.17 for air brakes, or a total of \$88,681.17 which is treated as a donation.

Interest due bondholders canceled.—Vouchers aggregating \$37,500, covering interest during 1904 and 1905, were receipted by the payee, Mrs. Green, and returned to the carrier; no money, however, was paid in this transaction. Interest coupons from July 1, 1908, to August 1, 1909, amounting to \$83,749.96, were surrendered and canceled without payment, the result being that the company had returned to it \$121,249.96 in interest, which is also treated herein as a donation.

Money advances by Texas Midland Construction Company.—This company advanced money to and for account of the railroad to the extent of \$1,658,762.90. Of the sums advanced \$500,000 is still due, \$116,481.81 was liquidated by cash and material payments, \$264,061.38 was paid by an equal amount of first-mortgage bonds in 1908, and the remainder, \$778,215, was canceled in August, 1908. It does not appear that these advances were evidenced by notes or other forms of certificates of indebtedness, and the cancellation of this amount is recorded only in the accounting adjustment of the item.

Donations account of spur tracks.—There was contributed by individuals and companies the sum of \$1,130.30 to reimburse the railroad for expenditures made by it in the construction of side and

spur tracks; the property so constructed, it is understood, is owned by the carrier.

Other donations.—Two checks, aggregating \$981.95, were issued by the Texas Midland Construction Company, one to cover \$250 personal expenses of E. H. R. Green in the purchase of rail, the other for \$731.95 for freight on slack coal for burning ballast.

LEASED RAILWAY PROPERTY.

As heretofore stated, the Texas Midland Railroad makes use of certain tracks and facilities of other companies, as follows:

Name of owning company.	Description and location of facility.	Amount payable for use for the fiscal year 1914.
St. Louis Southwestern Railway Co. of Texas.	13.97 miles of track, Greenville to Commerce, Tex.	\$32,133.33
Houston & Texas Central Railroad Co.....	1.21 miles of track and passenger station, Ennis, Tex.	1,800.00
Paris & Great Northern Railroad Co.....	0.39 of a mile of track and passenger station, Paris, Tex.	1,172.43
Total.....		35,105.76

During the same period the carrier received \$626.50 rent for use of facilities owned by it, \$182.50 of which was received from carriers and \$444 from other tenants.

MATERIALS AND SUPPLIES.

An inventory of the materials and supplies of the railroad company was taken by the accountants, jointly with the representatives of the carrier, as of June 30, 1914. The prices applied were obtained from invoices rendered the carrier in the purchase of its materials and supplies and from cost data compiled by the accountants in their analysis of the carrier's records; the representatives of the carrier also cooperated in this feature of the work. The result of the inventory was to show an increase in the material accounts of nearly \$14,000, and although the carrier was possessed of a copy of the inventory since July 17, 1915, no reconciliation was made by it of the material account, and the unadjusted book record has been used in the general balance sheet statement. A distribution of the book record and the inventory follows:

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Account.	Book record.	Inventory.
Fuel.....	\$1,383.94	\$1,869.59
General store.....	6,216.22	6,495.84
Crossties.....	15,033.70	13,073.92
Shop.....	39,496.18	58,284.52
Roadway.....	20,813.20	17,133.32
Total.....	82,943.24	96,857.19

In stating the value of materials and supplies on hand no deduction whatever has been made for depreciation. In all cases of new property the cost figure is applied. In cases of secondhand property an attempt was made to apply a fair secondhand price, but there was comparatively little of such property.

EXHIBITS.

Subjoined in this appendix are exhibits, as follows:

Exhibit A.—Adjustment of investment in road and equipment.

Exhibit B.—Classification of recorded expenditures for road and equipment.

Exhibit C.—Income account for the period, February 26, 1893, to June 30, 1914.

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EXHIBIT A.—Adjustment of investment in road and equipment.

Investment in road and equipment as recorded..... \$2,748,171.46

Add:

Property expenditures charged to operating expenses	\$184,505.55	
Property expenditures charged to income account	453,991.92	
Property expenditures charged to suspense account	22,245.99	
Appraised value of equipment acquired from Texas Central Railway	21,000.00	
Depreciation credited to this account in error	152,727.53	
Contribution of interest credited to this account in error	37,500.00	
Arbitrary credit to adjust this account to par value of securities issued, now reversed	32,230.05	
		904,251.04
		3,652,422.50

Deduct:

Expenditures now transferred to operating expenses	51,349.64	
Expenditures now transferred to profit and loss	32,069.36	
Discount on bonds	75,000.00	
Credited in error to revenue account	90.50	
Two dismantled locomotives now written out	6,000.00	
Abandonment of 1.93 miles of roadbed and track	19,277.54	
Sidetrack expenditures included as aids	1,130.30	
Noncarrier lands	891.79	
Securities issued in acquisition of property of Texas Central Railway	\$1,250,000.00	
Less recorded cost of construction	550,987.15	
		699,012.85
		846,266.90

Investment by Texas Midland Railroad and Texas Central Railway	2,767,600.52
Investment by others, classed as aids, donations, etc	124,760.42
	2,892,360.94
Total investment (maximum)	75 I. C. C.

EXHIBIT B.—Classification of recorded expenditures for road and equipment.

Account.	Expended by—		Total expend- itures.	Donated to Texas Midland Railroad.	Total.
	Texas Central Railway.	Texas Midland Railroad.			
ROAD.					
1. Engineering.....	\$17,603.42	\$29,612.38	\$47,215.80		\$47,215.80
2. Land for transportation purposes.....	8,389.80	13,573.89	21,943.69	\$44,608.75	66,557.44
3. Grading.....	106,269.58	249,531.23	355,800.81		355,800.81
6. Bridges, trestles, and culverts.....	72,881.20	199,448.72	272,329.92		272,329.92
8. Ties.....	85,035.31	130,455.50	215,490.81		215,490.81
9. Rails.....	164,521.95	334,387.74	498,909.69	250.00	499,159.69
10. Other track material.....		58,340.08	58,340.08		58,340.08
11. Ballast.....		169,300.23	169,300.23	731.95	170,032.18
12. Tracklaying and surfacing.....	57,398.21	194,174.93	251,573.14		251,573.14
13. Right-of-way fences.....		38,187.47	38,187.47		38,187.47
15. Crossings and signs.....	1,368.23	3,872.06	5,240.29		5,240.29
16. Station and office buildings.....		88,149.74	88,149.74		88,149.74
17. Roadway buildings.....	12,425.40	7,707.37	20,132.77		20,132.77
18. Water stations.....	710.85	33,947.03	34,657.88		34,657.88
19. Fuel stations.....		4,123.92	4,123.92		4,123.92
20. Shops and enginehouses.....	43.00	47,369.19	47,369.19		47,369.19
26. Telegraph and telephone lines.....		3,277.89	3,277.89		3,277.89
27. Signals and interlockers.....		10,205.55	10,205.55		10,205.55
29. Power plant buildings.....		5,154.46	5,154.46		5,154.46
36. Paving.....		647.58	647.58		647.58
37. Roadway machines.....		12,767.17	2,767.17		2,767.17
38. Roadway small tools.....	106.50	762.71	869.21		869.21
39. Assessments for public improve- ments.....		9,477.50	9,477.50		9,477.50
43. Other expenditures—Road.....	4,976.16	101,724.53	106,700.69		106,700.69
44. Shop machinery.....		47,591.53	47,591.53		47,591.53
46. Power plant machinery.....		9,070.45	9,070.45		9,070.45
Expenditures for industrial sid- ings (distributed above) for which the carrier was reim- bursed by parties benefited.....		1,130.30	1,130.30	1,130.30	
Total road.....	\$531,709.61	1,790,397.39	2,322,107.00	46,721.00	2,368,828.00
EQUIPMENT.					
51. Steam locomotives.....		180,547.84	180,547.84		180,547.84
53. Freight-train cars.....		87,732.13	87,732.13	* 78,039.42	165,771.55
54. Passenger-train cars.....		116,595.45	116,595.45		116,595.45
57. Work equipment.....		59,659.75	59,659.75		59,659.75
Total equipment.....		2 444,535.17	444,535.17	78,039.42	522,574.59
GENERAL EXPENDITURES.					
71. Organization expenses.....		374.00	374.00		374.00
72. General officers and clerks.....		212.85	212.85		212.85
73. Law.....		21.50	21.50		21.50
77. Other expenditures—General.....		50.00	50.00		50.00
Total general expenditures.....		658.35	658.35		658.35
Grand total.....	\$531,709.61	* 2,235,890.91	2,767,600.52	124,760.42	2,892,360.94

¹ Credit.² Includes \$21,000 appraised value of equipment acquired with the Northeastern branch of the Texas Central Railway.³ Cost of donated equipment in existence on June 30, 1914.⁴ Total expenditure shown for Texas Central Railway is that remaining after making deduction for 1.93 miles of road abandoned.

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EXHIBIT C.—Income account for the period February 26, 1898, to June 30, 1914.

Fiscal year ended June 30—	Freight revenue.	Passenger revenue.	Mail revenue.	Express revenue.	All other railway operating revenues.	Total railway operating revenues.	Maintenance of way and structures.	Maintenance of equipment.	Traffic expenses.	Transportation expenses.	General expenses.	Total railway operating expenses.
1893.....	\$7,164.27	\$3,097.90	\$3,096.95	\$508.93	\$75.25	\$10,847.25	\$573.41	\$941.97	.....	\$4,882.33	\$4,912.05	\$11,009.46
1894.....	45,690.91	10,866.97	2,375.87	1,500.00	226.70	60,651.63	20,548.02	9,033.15	.....	22,695.73	13,030.84	65,358.84
1895.....	163,422.53	22,060.41	2,823.86	2,654.03	64.16	193,577.10	59,760.69	20,324.18	.....	69,880.77	42,173.62	182,301.26
1896.....	108,612.77	27,202.20	2,032.86	8,120.01	117.69	141,876.53	57,125.34	23,954.09	.....	61,384.84	15,637.54	138,101.81
1897.....	238,118.50	48,209.72	5,037.43	5,234.96	282.80	296,678.33	60,123.99	43,422.55	.....	129,081.79	20,268.94	246,911.27
1898.....	356,818.41	71,027.12	4,573.15	6,234.96	591.01	433,268.76	94,512.44	45,822.01	.....	178,552.32	20,689.80	340,575.12
1899.....	370,018.49	78,210.87	10,554.17	6,905.27	591.16	473,288.76	120,546.01	50,252.00	.....	183,578.07	26,581.06	380,093.88
1900.....	327,345.20	80,691.04	10,555.09	10,505.01	1,324.71	435,371.05	145,998.97	42,377.40	.....	190,518.07	40,244.84	405,589.83
1901.....	484,382.90	121,121.06	10,555.09	13,416.66	2,197.28	631,672.99	142,247.03	82,377.40	.....	197,595.91	53,202.86	463,535.18
1902.....	374,308.97	132,519.61	10,555.09	16,185.56	2,245.38	535,814.60	135,523.32	67,330.26	.....	170,744.84	62,413.20	442,612.38
1903.....	356,331.86	119,004.47	9,876.48	12,511.26	4,284.15	492,024.33	135,697.61	60,973.58	.....	180,577.91	40,429.28	432,660.98
1904.....	306,852.07	122,901.54	9,876.48	11,772.47	24,354.34	469,718.72	127,383.83	59,937.51	.....	195,769.80	39,087.42	457,705.05
1905.....	274,405.53	108,513.74	9,876.48	12,845.47	17,846.25	423,389.69	94,901.11	56,658.26	.....	171,189.72	42,276.61	384,926.51
1906.....	355,244.51	113,483.25	10,744.54	12,023.30	31,245.20	521,816.89	94,066.16	75,393.88	.....	230,187.59	35,020.14	465,958.77
1907.....	296,463.92	105,389.77	10,735.50	12,023.30	11,964.53	406,597.02	98,319.70	112,393.88	\$15,083.22	197,141.83	35,721.82	430,215.13
1908.....	360,515.32	109,667.85	10,638.42	12,751.31	17,541.67	509,974.57	121,005.59	90,833.72	15,608.38	167,080.79	34,771.96	481,894.14
1909.....	397,136.38	119,602.66	10,734.22	14,688.47	17,815.66	559,977.39	116,583.71	91,943.05	16,814.12	203,854.62	34,300.81	550,497.74
1910.....	427,156.02	139,226.34	9,872.78	8,666.53	19,037.21	603,878.88	128,824.09	129,129.88	19,311.45	254,847.93	32,266.56	623,359.39
1911.....	480,676.84	141,719.20	9,872.52	10,383.44	21,814.67	673,466.76	143,006.19	134,573.81	20,172.83	307,609.88	38,382.71	692,376.08
1912.....	580,524.42	185,304.02	10,470.08	10,470.08	21,472.53	807,703.57	187,388.82	115,172.04	21,758.44	300,146.12	37,912.64	8,539,431.88
1913.....	468,310.34	214,893.33	10,293.34	11,900.94	21,705.30	727,200.85	137,388.82	95,172.04	.....	300,146.12	37,912.64	692,376.08
1914.....	7,132,056.86	2,187,621.00	180,179.39	209,340.46	280,201.09	9,939,298.80	2,326,597.73	1,444,608.92	128,284.77	3,856,547.41	783,413.05	8,539,431.88
Total.....	7,132,056.86	2,187,621.00	180,179.39	209,340.46	280,201.09	9,939,298.80	2,326,597.73	1,444,608.92	128,284.77	3,856,547.41	783,413.05	8,539,431.88

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Fiscal year ended June 30—	Operating ratio (per cent).	Net revenue or deficit.	Railway tax accruals.	Total oper- ating income or deficit.	Nonoper- ating income.	Gross in- come or loss.	Hire of equipment debit bal- ance.	Joint facility rents.	Interest on funded debt.	Interest on unfunded debt.	Total deduc- tions from gross income.	Net income or loss.
1893.....	101.50	\$1,512.21	\$2,245.23	\$1,512.21	.....	\$1,512.21	.....	.....	.....	.....	.....	\$1,512.21
1894.....	107.75	1,470.22	2,669.37	1,470.22	.....	1,470.22	.....	.....	.....	.....	.....	1,470.22
1895.....	97.79	4,275.84	4,870.60	1,095.89	.....	1,095.89	.....	.....	.....	.....	.....	1,095.89
1896.....	111.44	16,225.20	5,685.82	39,478.29	\$228.50	39,697.09	.....	.....	.....	.....	.....	1,658.97.09
1897.....	84.69	48,182.11	10,690.89	87,978.64	221.55	88,146.99	.....	.....	.....	.....	.....	1,530.21.16
1898.....	77.54	88,699.53	11,809.41	75,355.47	168.35	75,523.47	.....	.....	.....	.....	.....	43,146.99
1899.....	81.54	87,174.88	13,957.44	13,774.88	8.00	13,774.88	.....	.....	.....	.....	.....	30,373.47
1900.....	93.63	27,732.32	13,785.35	154,322.46	.....	154,322.46	.....	.....	.....	.....	.....	1,313,300.80
1901.....	73.39	168,107.81	14,467.26	72,537.07	.....	72,537.07	.....	.....	.....	.....	.....	109,185.68
1902.....	83.76	87,004.83	12,873.64	46,538.31	444.63	46,983.40	.....	.....	.....	.....	.....	27,981.70
1903.....	88.17	59,411.95	13,555.32	7,502.44	395.09	7,897.53	.....	.....	.....	.....	.....	1,934.00
1904.....	95.39	21,657.76	13,535.08	58,751.18	.....	58,751.18	.....	.....	.....	.....	.....	1,374,977.58
1905.....	86.31	72,885.26	13,535.08	49,963.18	.....	49,963.18	.....	.....	.....	.....	.....	13,751.18
1906.....	84.30	66,463.18	16,500.00	66,324.72	.....	66,324.72	.....	.....	.....	.....	.....	4,963.18
1907.....	84.76	79,524.72	13,200.00	64,530.07	.....	64,530.07	.....	.....	.....	.....	.....	21,324.72
1908.....	112.16	149,381.75	15,163.32	64,536.93	.....	64,536.93	.....	.....	.....	.....	.....	124,850.47
1909.....	84.37	79,690.44	15,162.51	62,252.94	.....	62,252.94	.....	.....	.....	.....	.....	1,41,719.52
1910.....	86.06	78,083.25	15,800.31	37,288.43	.....	37,288.43	.....	.....	.....	.....	.....	1,62,089.09
1911.....	91.16	53,381.14	16,092.71	108,669.76	.....	108,669.76	.....	.....	.....	.....	.....	1,98,755.45
1912.....	81.76	122,819.90	19,150.14	165,410.06	.....	165,410.06	.....	.....	.....	.....	.....	1,35,657.13
1913.....	77.17	184,344.18	23,883.78	110,941.01	28.62	110,949.59	.....	.....	.....	.....	.....	15,004.79
1914.....	81.46	134,834.79	23,883.78	110,941.01	8.58	110,949.59	.....	.....	.....	.....	.....	1,50,545.04
Total.....	85.92	1,399,866.92	274,367.20	1,125,499.73	1,504.22	1,127,003.94	237,823.11	116,113.84	1,148,949.71	3,157.79	1,506,044.45	379,040.51

1 Deficit or loss.

APPENDIX 3.

STATEMENT OF METHODS.

In making valuations of steam railroads the entire country was divided into five districts, each containing approximately 50,000 miles of railway. This division was generally a territorial one by state lines, but an entire railway system has been usually assigned to one district, even though it extended into the territory of another district. Thus, the Northern Pacific Railway was assigned to the Pacific district, although it ran through the states of three districts.

The work itself was divided, according to its character, into three sections or classes—engineering, land, and accounting. These titles sufficiently indicate the general nature of the work of the several sections.

The Commission created for the prosecution of this task a bureau of valuation, the overhead organization of which is as follows:

1. A director, having general charge of all branches.
2. An advisory board, whose duty it is to consider questions arising in the institution and prosecution of the work with a view to advising the director and the Commission.
3. A solicitor, having charge of the law matters peculiar to valuation under the chief counsel of the Commission; and, in each district, a valuation attorney, who also has general charge of land matters in the district.
4. An engineer, in charge of the engineering work in each district. These five engineers together make up what is known as the engineering board, which confers upon all engineering matters and recommends as a board to the director the methods and regulations which are to be followed as to engineering matters.
5. A supervisor of land appraisals, having general jurisdiction over all matters relating to lands.

Under him as to land in each district is the valuation attorney, having immediate charge of land matters in that district.

6. A supervisor of accounts, having general supervision of this subject.

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A district accountant, acting under the direction of the supervisor of accounts, is in immediate control of matters of accounting in each district.

Some further reference to the working organization will be made in developing the methods employed.

THE ENGINEERING SECTION.

The valuation act requires the Commission to show, among other things, the cost of reproduction new and the cost of reproduction less depreciation of the property owned or used for common-carrier purposes. The work of the engineering section covers these two items except as to lands.

The act also requires that the Commission shall prepare an inventory of the entire property of every common carrier subject to the provisions of the act. The property of a railroad company usually embraces, in addition to its property which is used for common-carrier purposes, other property not so used. All this property must be listed by the Commission in its general inventory, but only that portion of it which is used by the carrier for its operative purposes is dealt with by the engineering section. The inventory which is treated of here includes, therefore, only operative property.

THE ENGINEERING INVENTORY.

An inventory like that called for by the act may be produced in two ways:

1. The Commission may require the carrier to file an inventory of its property and may check that inventory when filed.
2. It may make the inventory itself, calling upon the carrier for such information and assistance as may be needed.

An examination of the valuation act makes it clear that Congress intended to provide for the investigation and marshaling of every fact which can bear upon the value of the property of the carriers. The basis of all that information is the inventory or list of the physical property of the carrier. The act provides that the Commission shall from time to time revise and correct the valuations which it makes. It has been felt, therefore, that such an inventory should be prepared as will put beyond cavil the physical property which the carrier possessed at the date of such inventory, and that this inventory should be kept current to a like degree so long as may be necessary. The inventory presented must have been so prepared that it will command the confidence of all parties. That kind of an inventory is of underlying and permanent value; no other inventory can be final.

An inventory of this character can only be prepared after an inspection of the property. Some representative of the Commission must either see the property which is included or must ascertain such facts as demonstrate the existence of that property to a reasonable certainty. If an inventory is filed by the carrier, it must be checked by the Commission to this degree of certainty, and this would mean that the work of filing the inventory would be duplicated by the work of subsequently checking the same inventory. It was felt that the total expense of preparing the inventory would be less if made by the Commission in the first instance with such assistance from the carrier as could properly be called for and granted. This method avoids the duplication of effort and secures an inventory which can be vouched for by the Commission and which also reflects the claims of the carrier itself, at the least total outlay by which a result of that character could be obtained.

ENGINEERING FIELD FORCES.

In following out the above method it has been found expedient to divide the engineering field force into different branches.

The road-and-track party measures and inventories the roadway and all structures connected therewith except bridges of over 12 feet in length, and buildings. This party measures the actual length of the road. The entire roadbed is cross sectioned for the purpose of determining and classifying the quantities of material which were moved in its construction. Ties in two 600-foot sections of each mile are counted and the kind observed. It is assumed that these sections fairly represent the entire mile and tests made by checking the result thus obtained against a precise count of every tie show that the plan produces a substantially accurate result.

The amount of ballast is determined by field measurement. Where subsidence occurs this also is measured, so far as possible, by borings, cross-section ditches, etc.

The records of the carrier are observed and availed of in so far as they seem to indicate in a reliable way actual quantities.

The bridge branch deals with bridges over 12-foot span.

The building branch takes all buildings and similar structures, like water and fuel stations.

The signal branch handles interlocking plants and signals of all kinds.

In case of a very simple property the roadway-and-track party inventories bridges and buildings along with the roadway, thus avoiding the necessity of sending an additional party over the line, but experience shows that where properties are at all complicated

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the work can be more expeditiously, more satisfactorily, and more cheaply done by the several branches acting independently.

The mechanical branch deals with equipment of all kinds and with shop tools and machinery. Generally electrical appliances are comparatively simple and are handled by the mechanical branch, but in the eastern district, where many electrical installations are extensive and complicated, a separate branch has been established.

COOPERATION.

The act requires carriers to furnish maps, profiles, plans, and other information of this sort as required by the Commission. It also enjoins upon carriers cooperation in the entire work. It has been the effort of the Commission to so prosecute its labors as to secure from the carrier a large measure of cooperation, and to this endeavor carriers as a rule have generously responded.

The Commission has required the carriers to prepare maps and profiles of their road in specified form. It was at first provided that these maps and profiles should be filed with the Commission either by depositing with it the original tracing or some mechanical reproduction of that tracing which would be equally distinct and durable. This was upon the theory that the Commission ought to have in its files such maps, but experience has shown that the interest of the public will be equally well served if the carrier prepares and preserves these maps in some secure manner, furnishing to the government blue-print copies whenever required. This relieves the carriers from what they have considered a burden without detriment to the undertaking of the Commission.

It has been believed that one of the results which will follow this valuation work is that the carriers will hereafter keep their engineering and other records in proper form. This has not been done by all carriers in the past, and the present seems to be a favorable opportunity for the prescribing of proper standards and the adoption of rules which will require the observance of those standards. The Commission has, however, been extremely solicitous not to require the carriers to furnish anything which would not be of permanent value unless absolutely essential.

In addition to the above maps and profiles, carriers have been required to furnish for the benefit of the engineering section whatever plans they might have of buildings, bridges, signal interlockers, etc. They have not been required up to the present time to construct new plans when there were none in existence. They have also been required to file schedules of their equipment and a list of their industry tracks.

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The Commission has also requested carriers to cooperate by furnishing certain engineers detailed to operate in the field with the engineers of the government, and as a rule these requests have been acceded to by the carriers. A representative of the carrier, ordinarily known as a pilot, accompanies each road-and-track party. This person is an engineer of experience and ability whose duty it is to point out the property to be inventoried and to see that it is properly measured, inventoried, and classified. Before beginning work he prepares himself by a careful examination of the records of the carrier, by going over the property in advance, and by conferring with others.

The bridge party consists of two engineers, one furnished by the Commission and in charge of the party, the other furnished by the carrier. The building party is of the same size and is made up in the same way. It sometimes happens that additional men are associated with these parties for the purpose of assisting in taking measurements, etc., and these are sometimes furnished by the Commission and sometimes by the carrier.

The mechanical party also consists of two engineers, one supplied by the Commission, the other by the carrier. In all cases the Commission engineer is in charge of the party, but the two men are usually of about the same grade and qualification and freely consult each other.

Carbon copies of all field notes are furnished to the representative of the carrier, who signs the same as evidence that they have been correctly taken, so far as his observation goes. If the representative of the carrier dissents upon any point, such dissent is minuted upon the notes themselves at the time.

It is generally agreed between the bureau and the carrier that such notes shall be taken as correct, unless altered by the Commission upon notice to the carrier or unless objection is filed by the carrier within a limited time.

It will be seen, therefore, that this inventory is really the joint product of the carrier and the bureau, or, at all events, that the Commission's valuation forces have fully considered everything which the carrier desires to point out or to say in the completion of the inventory. It is believed that under the plan adopted all unnecessary duplication of effort has been avoided and that a more accurate inventory is produced than would otherwise be obtained.

Thus far there has been almost no complaint of omission upon the part of the carrier and comparatively little dispute as to quantities. What dispute has arisen has been as to matters of principle rather than of observation or computation.

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FORM OF INVENTORY.

The valuation act requires an inventory in detail of each piece of property of the carrier. Since this requirement would be impossible of performance if construed narrowly, a practical solution must be sought. What is "each piece of property" within the meaning of the act, how shall that property be enumerated, and what units shall be employed?

Since, in estimating cost of reproduction new, it will be necessary to apply to these units when assembled a price, it seems to follow that those units should be employed which are current in the purchase and sale of the property under consideration or are commonly used in construction contracts and settlements.

Ties, for example, are bought and sold by the piece; therefore, the single tie is the unit. The price varies according to the kind and size of tie, therefore, within reasonable limits ties should be thrown into classes.

Rails are bought and sold by the gross ton. This is therefore taken as the unit.

Track fastenings are usually purchased by the net ton and this is the unit for that commodity.

With equipment the single car or engine is the unit, but these units when of the same series are thrown into groups exactly as are ties or tons of rail.

Bridges and buildings present a more doubtful case. It has been finally decided to report separately bridges of over 12-foot span. All under that are grouped. In reporting the individual bridge a brief description is given, and the superstructure and substructure are generally reported separately. When the substructure can be divided the masonry is treated as a separate item, other items being grouped.

Buildings of considerable cost are reported by individual structures, the different parts of the structure being specified. The cost of foundations, platforms, buildings, are each shown separately, and frequently the heating and lighting plants are also priced as a separate item.

It is believed that this detail is sufficient to enable the one who examines the report to form a fairly accurate judgment of the character and condition of the property, which might not be conveyed by a mere statement of reproduction cost or reproduction less depreciation.

The act requires that the physical property shall as nearly as practicable be classified in conformity with the classification of expendi-

tures for road and equipment as prescribed by the Commission. The classification of the Commission now names 62 primary investment accounts, and using the units as above indicated the property of the carrier is grouped into these different accounts. For example, all items of expenditure which would be charged under Account 3 if the road were to be constructed at the present time are grouped together as grading, and so on for the other accounts. This classification is observed in all the reproduction estimates of the Commission.

VALUATION SECTIONS.

The inventory is prepared and the foregoing facts are shown by what are denominated "valuation sections." A valuation section is a particular portion of the road designated by termini and treated as one piece of property; that is, all the grading, bridges, rails, etc., upon that valuation section are inventoried separately from the balance of the property of the carrier.

The reasons for the establishment of a particular valuation section are various.

(a) Ordinarily, property is inventoried to the owner. It may happen that in the building up of a railroad system some short line has been taken in by purchase, consolidation, or otherwise. The history of this line will be developed in our accounting work, and it is frequently desirable to know the original cost to date and the reproduction costs of this particular piece of road. For this reason it is treated as a valuation section.

(b) One carrier frequently gives to another carrier trackage rights over a portion of its line. When this part is considerable it is made a valuation section, so that it may be inventoried by itself.

(c) It frequently happens that the cost of construction varies upon different parts of a railroad, and this is almost always the case where that railroad is of considerable extent. One purpose of the valuation section is to put together those parts of the railroad where the construction cost is approximately the same and where the same unit price may therefore be applied.

(d) It is always desirable when possible to compare original cost with cost of reproduction. It frequently happens that the cost of constructing a particular section of a railroad is known, while the original cost of the portion upon either side may be unknown. In such case that portion of which the original cost could be identified would be made a valuation section.

(e) The act requires that the various costs and values shall be stated by states. This makes it necessary to observe under all circumstances state lines in the establishments of these valuation sections.

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(f) Some states have valued their railroads, and in so doing have created valuation sections of their own. It has been the policy of this Commission to observe those sections in so far as practicable.

The act requires the Commission to report its valuations separately by states, and valuation sections are finally summarized according to that requirement. The manner in which and the extent to which property has been allocated by states will be referred to later in this discussion.

SUBSTANCE OF THE INVENTORY.

The engineering inventory contains only property which is used by the carrier for its purposes as a common carrier. Noncarrier property in the nature of real estate appears in the report of the land section. Stocks, bonds, and other property of that character, together with noncarrier physical property other than land, appear in the accounting report. The engineering inventory enumerates all the operative physical property of the carrier which is now in existence, except land, and embraces nothing which is not in existence. If, for example, in improving the alignment of the roadway a portion of the original embankment has been abandoned, the abandoned part is not inventoried.

Present topographical conditions are assumed to exist, except as they have been altered by the construction of the railroad itself, and it is further assumed that the general condition of the country as to forest, tillage land, drainage, etc., is that of valuation date.

The estimate of reproduction cost arrived at in this manner does not correspond with the original cost of producing the property as it was in fact produced. The present railroads of this country are the product of a process of gradual development. The narrow-gauge road has passed into the standard gauge, the low class into the high class, the single track into the double track. Grades have been improved, curves eliminated. In the estimate of reproduction, all this is disregarded, and it is assumed that the existing property is reproduced by a single continuous impulse.

The railroad embankment is to an extent continually being dissipated. A portion of it is blown away, another portion is washed away. The parts dissipated are sometimes restored and more, and sometimes not. No account is made of the yards of grading which may have gone into the embankment unless they are found there upon the date of valuation.

Construction off the right of way, and perhaps upon land not owned by the carrier, is included, provided the structure is essential to the existence and operation of the railroad and would be to-day reproduced if the railroad itself were to be rebuilt. Thus a drainage

ditch might be included in the cost of reproduction if the character of the country is such that the maintenance of the ditch is necessary, but would not be embraced if it were no longer maintained as an essential part of the property.

It often happens that in the construction of a railroad the location of a public highway has been changed. Nothing is included in the reproduction estimate for the making of this change. Allowance is made for whatever structure has been provided by the carrier for the crossing of the highway, whether that structure is on or off the right of way, but it is assumed that the location of the highway would be as it now exists.

The foregoing paragraph applies in case of a highway crossing which has been constructed by the carrier. It frequently happens that highway crossings at grade are eliminated by providing an undergrade or overgrade highway. This may be by state statute or municipal ordinance, and it sometimes happens that the state or the municipality, or in some instances both, contribute to the cost of eliminating the crossing. In such case the carrier under the accounting rules of the Commission carries for the most part into Account 15, crossings and signs, the amount which it has in fact expended in the elimination of the grade crossing. In showing cost of reproduction it is assumed that the present undergrade or overgrade crossing would be reproduced as it was produced, and when those portions of the work which were involved in the elimination of the crossing can be clearly distinguished from the rest of the railroad, there is shown in our reproduction estimate under Account 15 the amount paid by the carrier.

It sometimes happens that quantities can not be identified so as properly to comply with the above rule, and in such cases the actual quantities which are found at the present time upon the carrier's right of way are placed and priced in the engineering inventory. If the carrier conceives that it is entitled as part of its reproduction cost to anything in addition to this, it can file its claim, which will be disposed of as justice seems to require in each individual instance.

In the construction of a new railroad it would probably be necessary to move buildings. No account is made of this in the engineering inventory.

It is said with truth that items of the two kinds last mentioned do almost invariably occur in the building of a railroad, and it is urged that if they be omitted from the estimate of reproduction cost that estimate does not fairly represent the cost of reproducing the property. The Commission is required to show the cost of reproduction new. This is not the cost of reproducing the property as it was produced, and no attempt is made to show that cost except as it appears

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in original cost. What expenses the carrier may have incurred for the moving of buildings and the changing of highways are always matters of more or less doubt. Assuming for the moment that these items should be added to reproduction cost for any purpose, it has seemed the better course to allow the carrier to present its claim for such items and to substantiate that claim by proper reference to its records or by such other evidence as may be available. Engineers in the field can not properly deal with such evidence; it is their function to observe and report upon what is now in existence.

It should also be noted that some items, particularly clearing and grubbing, will differ materially from the original units of the same kind. The forest has become tillage land since the road was originally built, and in some cases tillage land has become forest. The amount of clearing and grubbing in the reproduction estimate is determined by reference to the present character of adjoining lands and not to the conditions which prevailed at the time of original construction. If the road were to be constructed where it now is through the country as it now exists, the clearing and grubbing necessary would be what is shown in our reproduction estimate. The value of the lands is determined, not upon the basis of its original condition, but with reference to its present condition, and there seems to be no reason why it should be assumed for the purpose of fixing value that a field is in tillage and for the purpose of clearing and grubbing that it is covered with stumps which must be removed and which would render it untillable.

To the rule that cost of reproduction will always be shown in kind there are some apparent exceptions.

It may have been thought necessary in the original construction of the road to bring material for a considerable distance in order to secure a proper foundation for the track. Since the construction of the property sources of supply have been developed from which material of substantially the same kind, although not identical, might be obtained at a much less expense. In such case the engineering inventory would enumerate material of the general kind which is found in the track, but the price would contemplate the obtaining of that material from the less expensive source of supply and not from the original source.

It often happens that the track was at first supported upon a timber trestle which later was filled. The existing structure is an embankment, which contains upon the inside the original trestle. In the inventorying of the property this is measured, computed, and priced as though it was simply an embankment, no reference whatever being made to the trestle. In applying the price the engineer inquires whether approved construction would require the erection of a tem-

porary trestle from which the embankment would be built, or whether the embankment should be constructed without the expense of such trestle, or so much of it as has not decayed. If good construction would require a temporary trestle, then proper allowance is made for the same; otherwise the price is determined as though no trestle had ever existed.

The same rule would apply where, owing to climatic or other changes, a watercourse which existed when the road was constructed had dried up and disappeared. Originally that stream was crossed by a trestle or possibly a bridge, but when the necessity for this no longer existed the bridge or trestle was filled, presenting to-day a continuous embankment. In this case present topographical conditions are assumed, and nothing is included for the bridge necessary in the first building of the road.

It may sometimes happen that an abutment was originally constructed of stone which was brought from a long distance. To-day concrete would be provided at a very much less price than stone. Ordinarily the reproduction is in kind, and the cost of stone is used even though concrete might to-day be somewhat more economical, but this rule would not necessarily be followed in extreme cases.

SHRINK AND SWELL.

When earth is taken from a cut and deposited in an embankment the number of cubic yards in the embankment at first exceeds those in the cut. The amount of this excess will depend upon the weather during the progress of the work and upon the manner in which the work itself was done. If the earth has been moved with teams and scrapers or carts, the embankment is more compacted than when filled from a trestle. As time goes on this embankment shrinks and compacts, especially under the influence of operation, so that the number of cubic yards in the embankment is less than of those in the excavation which produced the embankment.

Rock, although shrinking somewhat after initial placement, will show a net swell. Solid rock blasted and placed in an embankment swells from 35 per cent to 70 per cent. Even loose rock produces an embankment considerably in excess of the excavation. Subsequently to being placed in the fill, rock shrinks, and this is taken into account in determining the net swell.

It is assumed that shrinkage will be complete at the end of five years. The amount of shrinkage in an earth embankment of that age varies with the character of the soil, but is found to be upon the average about 10 per cent, and approximately that allowance is made. The net swell of rock will vary from 15 per cent to 60 per cent, de-

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pending upon conditions, and no general rule can be laid down. If the embankment is less than 5 years old the engineer considers this in applying shrink and swell.

PAY QUANTITIES.

This does not, however, necessarily mean that the pay quantities stated in the inventory are 10 per cent in addition to what those quantities would be if the actual measurements were used. The effect which this shrink or swell may produce upon the pay quantities depends upon the method which is adopted in the stating and pricing of grading. Two methods are used, known, respectively, as the two-way method and the one-way method. Different unit prices are applied to the grading quantities reported, dependent upon whether the one-way or two-way method is used as the basis for determining the quantities stated. Which method is used in a particular case depends upon the character of the grading and the circumstances under which it is assumed to be reproduced, and is deemed to reflect sound practice.

Two-way method.—Under the two-way method quantities of both excavation and embankment are paid for. The cut and the embankment are each separately measured, and the number of yards as they actually exist in cut or embankment are extended upon the assembly sheet as the number of units to be priced. Under this method the quantity as actually measured in the excavation would be shown; the embankment as actually measured in the field would be increased 10 per cent on account of shrink. This is upon the supposition that these quantities existed when the contractor had completed his work and the embankment was ready for track. It is assumed that those quantities would be measured and paid for, that the present embankment is 10 per cent less in size owing to shrinkage, and that therefore, in order to translate present measured quantities into pay quantities under our reproduction estimate, this allowance for shrinkage should be made. No addition is made for either shrink or swell under this method in case of rock embankment.

In saying as above that the excavation is measured and actual quantities are shown, it must be understood that this is upon the assumption that the cut as it exists to-day fairly represents the cut which in good construction would have been produced in the building of a new railroad of this type or kind. It frequently happens that subsequent to the original construction cuts have been widened by the removal of earth for maintenance purposes. This earth takes the place of what has been dissipated by the operation of the road, the replacement of which is a proper maintenance charge and which

ought not to be included in reproduction quantities since it is no longer in existence.

It should further be noted that the fresh cut from the first begins to run down into the ditches, which must be kept open by removing this earth. This process also results in the gradual widening of the cut and also perhaps of the embankment, since the earth taken from the ditches is put upon the embankment.

The tendency of all this is to produce a quantity of excavation and sometimes of embankment which ought not properly to be paid for in a reproduction estimate. Ordinarily no account is made of all this, the cut and embankment being measured as they exist, but it sometimes happens that the borrow has been so extensive that our engineers do not measure the cut as it exists today, but rather the cut as it would exist in producing a new road of this type.

One-way method.—Under the one-way method only quantities of excavation are measured and paid for. The theory is that the contractor must place the earth taken from the excavation at whatever point the engineer of the carrier directs. If, therefore, the quantity of cut exactly equaled that of embankment the total pay quantities would be ascertained by measuring the cut, and would be just one-half the quantities stated under the two-way method.

In point of fact, however, the fill frequently exceeds the cut, so that it is necessary to obtain the additional amount of material required by borrowing. When the road is under actual construction and the borrow pit is new, it is usually possible to measure the amount borrowed, and in that event the cut (unless wasted) plus the borrow would equal the pay quantities.

With an old road it is impossible as a rule to measure with accuracy the borrow pit, which for various reasons and in various ways has been substantially obliterated, or, if not obliterated, so changed since the period of original construction that any measurement of the quantities then borrowed is impossible.

In order, therefore, to obtain the amount of borrow, it is necessary to measure both the cut and the embankment. By subtracting the cubic yards in the cut from the cubic yards in the embankment the quantity of borrow is ascertained. It is evident that in making this computation for the purpose of ascertaining the quantities required to reproduce the property, the present compacted embankment must be increased by the amount of shrinkage and decreased by amount of swell.

It is furthermore evident that while the quantity of excavation might be sufficient to construct the embankment, nevertheless the location would be such as to render the haul of the material from the excavation to the point at which it is needed for embankment an

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unduly expensive one. It is frequently cheaper to throw away or "waste" what comes from the excavation and borrow material from nearer sources. Contracts for grading usually provide that the contractor shall place the excavated material as required up to a certain limit, and that if he is required to haul it beyond that limit he shall be paid for this service. This free-haul limit runs all the way from 100 feet to 1,500 feet in actual contracts. The most usual free haul is 500 feet.

It will be clearly apparent, therefore, that the pay quantities determined in this way do not exceed actual quantities as measured in the fill by 10 per cent or by any other per cent and perhaps not at all. Shrinkage is allowed for and swell is also allowed for, but the actual pay quantities may not be affected by either shrink or swell.

INDUSTRY TRACKS.

Industry tracks are those connecting the line of the carrier with an industry and which are exclusively used for the purpose of the industry or in which the industry has a preferential use. The carriers claim that all such tracks over which their locomotives pass in receiving and delivering traffic to and from the industry should be embraced in the inventory as property used by them for transportation purposes. The Commission has not accepted this view, but believes that the circumstances under which the track was constructed and is now held and used should determine.

It often happens that a carrier constructs at its own expense a track connecting its line with an industry for the sole purpose of handling the traffic of that industry. Such track is clearly a part of the operative property of the carrier and is inventoried to it as such.

An industry frequently constructs entirely at its own expense a track from its industry to the line of the carrier. Section 1 of the act to regulate commerce requires the carrier to make and operate a switch connection with such a track and to furnish cars for it when the connection is made. Such a track is in no sense a part of the property of the carrier. The carrier neither built nor contributed to its construction. It has nothing to do with its maintenance. The mere fact that its locomotives may pass over the track in receiving and delivering traffic from and to the industry does not make it a piece of property used by the carrier for its purposes as a common carrier. No part of such a track would be inventoried to the carrier.

The great majority of industry tracks lie midway between these two extremes. They are constructed and maintained under a variety of contracts and with varying conditions. As a rule the carrier owns the rail, track fastenings, ties, and, generally speaking, the removable part of the track. The industry owns the land, which

reverts to it upon the termination of the use. Sometimes the carrier contributes to the expense of building the track, but usually the industry is required to pay for those portions of the track which finally become the property of the carrier. Such a track is provided primarily for the benefit of the industry. It is generally used exclusively for the purpose of the industry. It is in fact a plant facility, its purpose being to enable the industry to receive from and deliver to the carrier its traffic without the expense of drayage from or to some sidetrack or depot. It occasionally happens that the carrier uses this incidentally for its own purposes when not required by the industry, but while such provisions in the contract are frequent the actual use under those provisions is infrequent.

The rule adopted in the inventorying of such tracks is to give to the carrier whatever property of a removable character it could take up and carry away if the use of the track were to be discontinued, provided under the terms of the contract the carrier owns this property, even though it were originally paid for by the industry.

Where the title to the land reverts to the industry upon the cessation of the use, the reproduction estimate shows the grading and other permanent structures connected with the land, provided the carrier bore the expense of the same; otherwise not.

This rule gives to the carrier all or more than it can claim under the literal interpretation of the act. If cost of reproduction new or cost of reproduction less depreciation should be made the basis of value, the carrier would under this method of procedure add to its value large sums which it has received from the public, not as a voluntary donation but by a virtual assessment *in invitum*, since in most instances in the past the industry could obtain the sidetrack only by complying with the carriers' terms.

TO WHOM CARRIER PROPERTY IS INVENTORIED.

Ordinarily carrier property is inventoried in the name of the owner; that is, the details are shown in the inventory of the owner and not elsewhere. In case of jointly owned property the details would appear in the inventory of each owner.

Where property is owned by one carrier and exclusively used by another carrier the details would appear in the inventory of the owner, but the total amount would be shown in the inventory of the user as property used by that carrier. To illustrate: The Boston & Lowell leases its property to the Boston & Maine. The details of that portion of the Boston & Maine system which is leased from the Boston & Lowell would appear in the Boston & Lowell inventory, but in the inventory of the Boston & Maine the cost of reproducing this property would appear in the used column. The Boston

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& Lowell inventory would ordinarily be bound up with and treated as a part of the inventory of the Boston & Maine system. All other properties making up that system would receive the same treatment.

It may sometimes happen that the details of a property will be given in the inventory of the user only, the amount being stated in the inventory of the owner, but such an instance, if it occurs, will be especially noted in the inventory itself.

It often happens that a carrier which owns and uses its property gives to some other carrier a qualified use in that property in common with itself. Such use is generally denominated a trackage right, and is the right to use the tracks of the owner for a compensation usually varying with the extent of the use. Where such an arrangement exists as to property which is of sufficient value to be of significance, the portion in which trackage or similar rights are granted is inventoried by itself and the fact and nature of the use described in the inventories both of the owner and the user.

This will be made clearer by an illustration. The trains of the Texas Midland Railroad run from Paris upon the north to Ennis upon the south. Beginning at Paris the first 37 miles of line are owned by the Texas Midland; the next 14 miles between Commerce and Greenville are owned by the St. Louis Southwestern Railway Company of Texas, commonly known as the Cotton Belt; the remaining 74 miles are the property of the Texas Midland. It will be seen, therefore, that the use of this portion of the line between Greenville and Commerce makes up a part of the through line of the Texas Midland from Paris to Ennis.

The portion between Greenville and Commerce is made a valuation section upon the Cotton Belt and the various costs are determined with respect to that valuation section and reported in detail in the inventory of the Cotton Belt. The inventory of the Texas Midland shows the fact of this use and the valuation report upon the Texas Midland gives the terms and conditions of that use. The cost of reproducing this valuation section is not, however, carried into the used column of the Texas Midland.

The reason for this is obvious. If this reproduction cost appears in the used column of the Cotton Belt and again in the used column of the Texas Midland, the cost has been duplicated. It has been the desire of the Commission to appraise all the carrier property operated by carriers subject to its jurisdiction, but to report that property but once. When the used column of all carriers covered by this appraisal is totaled, it should give the total reproduction costs of all common-carrier property in the United States without duplication. This can not be done if the claim of the carriers that all prop-

erty over which a particular carrier operates shall be included as used both by the owner and by the user.

It is believed that the method adopted fully complies with the statute. For example, the portion of the Cotton Belt, above referred to, is inventoried. The fact of its use is referred to both in the inventory of the Cotton Belt and in the inventory of the Texas Midland. The conditions under which the use exists are set forth in detail both in the report upon the Cotton Belt and in that upon the Texas Midland. When in the valuation of these properties it becomes essential to know the cost of reproduction new or of reproduction less depreciation, the facts can be ascertained by reference to these reports; and the same of original cost if that can be shown. The physical property is not changed by this dual use. It can exist but once. If a part of the cost of that property is to be credited to the Texas Midland by virtue of the fact that it operates its trains over it, a corresponding portion should be deducted from the cost of the Cotton Belt. This property is used but once for the benefit of the public and ought not to be reported as twice used.

While the foregoing is true as to all pieces of property which are significant in character, there are many instances of small and comparatively insignificant items of railroad property which are used under lease with the owner which are not separately inventoried to the owner, and which could not be distinguished in the same manner as could these 14 miles. For example, the Texas Midland uses the passenger station of the St. Louis & San Francisco at Paris. That station is carried as a separate item in the inventory of the St. Louis & San Francisco and could be identified if desired. In reaching the station the tracks of the St. Louis & San Francisco are used by the Texas Midland to a limited extent. These tracks are not embraced in the inventory of the station, and the portion of the track which is used by the Texas Midland in entering the station is not inventoried separately from the other tracks of the St. Louis & San Francisco at that point. This had not been done, because it would involve an immense amount of labor without any corresponding beneficial result.

A carrier may lease for its city ticket office a room in a building belonging to some private party and used mostly for private purposes. That room, however, is used by the carrier for its purposes as a common carrier. It can scarcely be claimed that it is the duty of the Commission to attempt to segregate that room from the balance of the building and show with respect to it the various costs. And this would be true if the building were entirely owned by some other common carrier which used the balance of it for common-carrier purposes, in which event the entire building would be inven-

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toried to the owner. This act must receive a sensible and practical interpretation.

These trackage rights, while often of great importance, run into most minute uses. A few feet are frequently involved. Sometimes the use will be occasional, but once a week, or even once a year. To say that the Commission must seek out every instance of that kind, make each of these pieces of track a valuation section, distinguish between those pieces which are used by one carrier in common with the owner, or by several carriers in common with the owner, would be to impose a most intolerable burden and to confuse beyond reason the reports themselves without practical benefit.

DEPRECIATION.

As treated by the Commission, depreciation may be defined as the lessening in cost value due to the smaller number of service units in the property as found, than in the same property new. An article when new contains, so to speak, a certain number of units of service; as those units are exhausted the article depreciates. When they are all used up the service life ends.

It is assumed that the loss of these units of service is evenly distributed throughout the entire life of the article. In point of fact this is not exactly true. Some articles may depreciate more rapidly in the early years of service and others in the last years, but the practical way is to assume that the loss is uniform, and it is believed that this as applied generally will produce a fair result.

The extent of depreciation is expressed in condition per cent stated as a fraction, of which the denominator expresses the total service units while the numerator gives those remaining. Thus, 80/100 means that of 100 units of service 20 have been exhausted, while 80 remain. Ordinarily this fraction would be obtained by using total life for the denominator and remaining life for the numerator, but in some cases the fraction only expresses the relation between service units new and the service units at the date of valuation.

It sometimes happens that an article may be used for certain purposes so long as it is fit for those purposes and afterwards put to some other use. In such case the article is depreciated with reference to the purpose for which it is being used. For example, rail is divided into two general classes, new and relay. It is bought and sold under these terms. New rail is generally laid in the main line where the use is most exacting. When in process of time it becomes unsuited to the more exacting conditions of that place, it is removed and put into a sidetrack or branch line, or perhaps into the main line of a logging road or some other railroad for which it may suffice. In ascertaining the depreciation of rail new, rail is depreciated down to

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relay; that is, we inquire how long before this rail which was laid as new must be taken up and put elsewhere as relay, and this period is treated as the total life of the new rail. If the relay rail is placed in the sidetrack the inquiry is how long it will last in that place. If the sidetrack had been in fact laid with new rail, the inquiry would still be the same; namely, What is the life of new rail in a sidetrack? The life of the new rail in the sidetrack would, of course, be longer than that of the relay rail. In applying this fraction, which states condition per cent for the purpose of obtaining in dollars the cost of reproduction less depreciation, account is made of salvage or scrap. By salvage is meant the value of the article for some use other than that to which it has been devoted, while scrap designates the junk value; that is, its value if broken up. In making the computation salvage or scrap is first deducted, the remainder is depreciated, and the salvage or scrap then added to the depreciated cost. Thus, if an article when new costs \$100 and the scrap is worth \$10 and condition per cent 50/100, \$10 would be subtracted from \$100, \$90 depreciated, and the \$10 added to the depreciated cost, giving as cost less depreciation \$55.

In applying the above principles it is necessary to determine total life and future life. The date of installation or of the beginning of the use is usually known, and if total life can also be fixed, future life may be obtained by subtracting the one from the other.

Ordinarily, therefore, the problem is to determine total life. This may be done by reference to the experience of the past. Where sufficient time has elapsed so that articles of the kind under investigation have in fact been worn out and displaced, the period for which they have been in service is known and life tables can be prepared. In determining total life, observation is of value. The amount of wear which has taken place in a given number of years can be noted and from this the total life can be calculated. The opinion of those who are qualified by their training and experience to form such opinion is also of service. From all sources an estimate of total life must be formed, and a great amount of study has been devoted to this, mainly in the way of collecting statistics from the experience of the past.

There are two kinds of depreciation, physical and functional. Physical depreciation is due to deterioration through age or wear. A piece of property will sometimes deteriorate as rapidly when standing idle as when in active service, while in other instances the deterioration is very slight unless in use. The real question always is what part of the physical life of this piece of property has gone, whether from the mere fact of age or from service.

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Functional depreciation results from the want of adaptation to function. While in working condition, a machine for some reason can no longer perform the work required of it, and, therefore, although still physically fit, must go out of service. This may be because the machine is too small, or because some better process has been invented, or for various reasons which render its further use impossible or undesirable.

Functional depreciation has played a very important part in the past development of railroad property. The station has been replaced because it was too small and not because it had worn out. The steel bridge has been removed because it could no longer carry the heavier rolling stock which modern methods of operation have rendered imperative. Cars and engines have been discarded, not for the reason that further repairs could not be made, but rather because the type had become obsolete.

It will be seen, therefore, that if a mortality table be constructed entirely or mainly from the experience of the past, functional depreciation will perhaps exercise a more dominating influence than physical depreciation. But it is by no means certain that what has occurred in the past will be true of the future. It generally happens that in the earlier and formative stages of any industry changes take place rapidly, whereas when time has indicated the best methods and types greater permanency occurs. It is hardly probable that functional depreciation will play the same part with the same articles in the future as in the past. The railroad builder of to-day will be more likely to supply in original construction or in reconstruction a bridge of sufficient capacity; the size of the locomotive will not so much increase, thereby rendering everything else too small, and even the type is likely to be more permanent. Upon the other hand, functional depreciation may be even more pronounced in some other direction. Electricity may supplant steam as a motive power, or some discovery may do away with both steam and electricity.

The Commission has found this matter of functional depreciation difficult to deal with for the foregoing reasons. The following course has in a general way been pursued:

As to the present, the engineers are instructed to consider functional depreciation which has already accrued. If the bridge is too light for the equipment being used and should be removed as soon as possible, that fact must be taken into account. If the station is too small to accommodate the traffic now flowing through it, that must be a controlling item in its depreciation. So of all other pieces of property. The depreciation has already taken place; the thing is no longer fit for its use and must be discarded.

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This being so, it makes no difference whether the cause be physical or functional.

As for the future, the instruction is that functional depreciation shall only be considered when it is imminent. This word admits of no exact definition. If in the near future such depreciation is certain to occur, or reasonably certain to occur, it must be considered by the engineer. If, for example, the railroad has already begun to remove bridges of a similar type because they are too light, this fact must be considered. If, while the station may do for a few years to come, plans are already being considered for its replacement, the architect must not close his eyes to this circumstance and look only to the physical condition of the property. Generally speaking, in so far as functional depreciation can be accurately forecast, it must be considered, but speculation must not be resorted to.

In constructing a life table—that is, in determining the probable total life of a given class of articles—the experience of the past will be scrutinized in the same way. Of this the steel bridge furnishes a good illustration. It has been said that the average life of steel bridges in this country has not exceeded 30 years. This may be true; our studies would indicate that some comparatively short period would represent the active service life of that structure; but it is also perfectly evident that this has been due, not to the actual wearing out of the bridge, but to its inadequacy. It is further not apparent that the same cause will be operative to the same extent in the future.

Thirty years is not, therefore, used as the total life by which steel bridges are to be depreciated. There is no way in which a satisfactory total life can be fixed for a structure of this character, but the engineers have decided that, taking all things into account, 70 years will probably fairly represent that period; certainly it is sufficiently long for an average life, and this figure for total life is used in the depreciation of steel bridges.

It must not be understood, however, that this life is used in case of all bridges irrespective of what an inspection may show, but simply that it is taken as such life unless inspection demonstrates that some other period should be used.

The engineer examines a bridge which has been in service for five years. He finds it to have been well maintained and to be entirely adequate to the traffic. So far as observation reveals, this structure is as good as it ever was, and if the engineer were required to point out the particular in which the bridge has depreciated he would be unable to do so. Nevertheless, it is certain that those causes which will finally put an end to the useful life of this structure have been at work, and it is considered that they have reduced the life 5 of the

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70 years of its probable existence. The condition of this structure would therefore be 65/70. In reaching this conclusion the only part played by the inspection is to establish that observation of the property indicates nothing as to the extent of depreciation. In other words, the condition of the property is normal.

Let it now be assumed that the same kind of a structure which has been in place for 30 years is under inspection. Observation shows that this structure, either through lack of proper maintenance or due to its location or from some accident of its use, is badly corroded and otherwise worn. If the same rate of depreciation continues for another 10 years the structure must be replaced. In this case the engineer would reduce the probable life from 70 years to 40 years; the bridge would be three-fourths worn out and its condition per cent would be 25/100.

Upon the other hand, an observation of this structure might show that it had been perfectly maintained and at the end of 30 years was apparently as good as at the beginning. The engineer might feel that this bridge was likely to continue in service for more than another 40 years, and in that event he might increase the total life as a result of his inspection from 70 to 80 years. The condition in this event would be not 40/70 but 50/80.

This increase in the total service life would generally be made in the latter half of the period and not ordinarily in the first half, since with a structure like a steel bridge or a masonry pier evidence of depreciation would not be likely to occur in the early years of its service if that depreciation were merely normal.

With respect to certain kinds of property there is a further embarrassment in determining total life, arising out of the fact that certain kinds of property may be almost indefinitely continued in service by the making of proper repairs. Given a car of a satisfactory type and size, the different parts may be replaced as they wear out and the car itself thus perpetuated. Such a car goes out of service not because it is worn out beyond repair but rather because as a matter of policy it is not considered economical to continue it in use. The controlling depreciation here is functional rather than physical. While, however, the car itself may continue, the different parts wear out, and to them a definite life can be assigned. The trucks have one life, the underframe another, the superstructure still another. In depreciating the car, therefore, each one of these parts is considered separately and given a condition per cent depending upon its age and condition. The whole is then combined into a weighted average and the condition per cent of the whole car stated.

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This method of procedure is rather too favorable to the carrier, since it assumes that the life of the car goes on forever, whereas in point of fact this will not be true. When the car finally goes out of service there will still be remaining units of service in some of the parts. To offset this, the engineer is instructed to consider whether, in view of the type of car, the use to which it is being put, etc., the car ought reasonably to be continued in service indefinitely. If it ought to go out of service, that fact is considered. This is really the application of functional depreciation which has already occurred.

The same principle is applied to the depreciation of a building which may be renewed and improved even by the making of repairs. The architect ascertains not only the age of the building but what repairs have been made upon it and when made. These facts he combines with the knowledge obtained by an inspection of the structure.

From the foregoing it will be seen that the effort of the Commission is to state with respect to each piece of property the number of service units which that property now has for the purpose for which it is being used as compared with new. In determining that fact an inspection of the property is made and the experience of the past, both as developed by the records of the carrier under valuation and from that of other carriers as well, is considered in the light of present knowledge and conditions.

By each piece of property is not necessarily meant each unit, since several units of the same class may sometimes be combined and considered as one piece. Thus the ties or the rails of a given class upon one valuation section might be treated as a single piece of property in stating depreciation.

The depreciation of overhead charges will be considered in connection with the discussion of such charges themselves.

Attached as a note to this appendix is a memorandum from the engineering board stating briefly the principles and methods to be applied in depreciation and giving with respect to the several primary accounts the normal service life and other details peculiar to each account.

APPRECIATION.

As already noted in the discussion of depreciation, most items entering into the construction and operation of a railroad begin to depreciate or lose in value and capacity for service almost from the first. To this the item of grading forms a notable exception. From the outset nearly everything embraced in this primary account begins to improve, and if properly maintained the improvement may continue for a considerable time. This is sometimes known as solidifi-

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cation and adaptation; in this discussion all forms of physical appreciation in the property are included under the comprehensive term "Appreciation."

Upon the threshold of any discussion of this subject a clear conception must be formed of what appreciation is and how accomplished. This will be best understood by noting what happens when a new railroad is put into operation.

The sides of the fresh cut under the action of rain and snow, freezing and thawing, work down into the ditches, which must be cleaned out. As time goes on the sides of the cut gradually assume what is sometimes known as a natural slope. They also become covered with various kinds of vegetable life which tend to hold the earth in place. All this lessens the filling up of the ditches.

Substantially the same thing occurs with the embankment. The sides of the new dump are especially susceptible to the action of the elements. The shoulders slough off and gullies open in the sides. Fresh earth must be brought in to repair the damage thus done.

Soft spots develop in the embankment, and in order to maintain the alignment of the track additional ballast and sometimes earth must be applied.

It will be observed that the carrier in doing all this adds nothing to the form or substance of the property. It simply maintains the structure in the same shape that it was. The cut may sometimes change in form and the embankment, especially near the cut, may be somewhat widened. The slope of the embankment itself may be somewhat changed, but the purpose is to simply keep the property in its original state; in other words, to make good the change or depreciation which has taken place.

It often happens that under operation there will develop defects which must be remedied by additional construction. A tile drain is put in at this point, a ditch is opened at some other point, a retaining wall may be required. All these things, however, are betterments to the property, the cost of which may be properly included in the investment account. They are all in existence to-day and will be inventoried and included in the cost of reproduction.

Disregarding betterments for which the carrier receives account elsewhere, it should be carefully noted that nothing has been added to this property in the course of maintenance. The effect of maintenance is simply to keep up the structure. The appreciation which has occurred, the improvement in the property, is entirely a natural process. The earth has settled together under its own weight and by the pounding of the trains passing over it. It would have been possible to compact this embankment artificially, but that never was done; the compacting which has taken place and the improve-

ment in texture which has occurred is due to a natural process incident upon the passing of time. This must be kept clearly in view in all discussions of appreciation.

It should be noted, in the second place, that this appreciation under the accounting rules of the Commission is part of the operating expense and is chargeable as such. No part of that outgo can be included in the investment account of the carrier. The carrier is entitled to pay out of its gross revenues operating expenses. It must charge as a part of those operating expenses a proper sum for depreciation of equipment, and it may charge some proper amount for depreciation of its road. What remains after the payment of operating expenses, depreciation, taxes, and similar items, belongs to the carrier. These expenses are just as much a part of maintenance as the renewal of the tie or the rail, only they are greater at first and less afterwards, while it is otherwise with the tie or the rail.

It may be still further noted in this connection that in estimating cost of reproduction work which was really done as a part of maintenance, and therefore paid for out of operating expenses, is almost certain to be included. As the sides of the cut run down into the ditches the cut itself grows wider; as this dirt is carried out onto the embankment, that also, especially in the vicinity of the cut, becomes wider. In determining the quantities for the purpose of a reproduction estimate, the cut is measured as it exists to-day, not as it did exist before operation began; that is, the portion which has been paid for out of operation is ordinarily included in the quantities to which a reproduction price is applied. To this extent the carrier gets the benefit of construction which was paid for not out of capital contributed by the owners of the property but out of operation.

The valuation act does not refer to appreciation. While the Commission is required to report cost of reproduction less depreciation, it is not required in terms to estimate appreciation. But the Supreme Court in the *Minnesota Rate Cases* has said that in showing value by the reproduction method appreciation, if it exists, should appear. It was the manifest purpose of Congress in passing the valuation act to marshal all those facts which might have a bearing upon the value of the property. Appreciation is such a fact, and the Commission would feel bound to report this added value if it could be ascertained upon any definite basis.

Engineers and commissions have often approved an allowance on account of solidification and adaptation. These allowances are not for the most part supported by reasons indicating how the result was reached. They were apparently off-hand estimates. They are not, of course, conclusive upon us. In other appraisals, nothing whatever was included on this account.

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It seems to be generally conceded that the total cost of maintaining a railroad increases as time goes on, for a number of years at least. This is because certain items of expense do not occur in the first years of operation, which must be taken care of later. For example, the renewal of ties is a very large item of operating expense in case of most railroads, but only a few ties require renewal at first. It is several years, often many years, before rails must be replaced. Ballast will wear a considerable time without renewal.

Upon the other hand, there are certain items having mainly to do with the care of the embankment and cuts which the carriers assert are greater in the first years than afterwards. These items would refer mainly to the keeping in order of the structure upon which the track is laid and would embrace the cleaning out of ditches, the restoration of deletions from the sides of the embankment, the keeping up of the alignment of the track, etc.

For the purpose of determining just how much the cost of these items in the early years exceeds their cost in later periods, the labor items entering into the expense of maintenance are separated. Certain costs, like the placing of ties, of rails, and of ballast, are subtracted from the total labor cost of maintenance. The balance is supposed to represent those labor items which are greater at the outset.

These items upon a new railroad for a series of years are compared with the same items upon an old railroad for the same years. Sometimes it is claimed that the period of appreciation extends over 5 years, sometimes over 10 years, and sometimes that it never ends. If the cost of these items for the aggregate period upon the new road is greater than the cost upon the old road, it is contended by the carriers that this demonstrates the greater cost of maintaining the new road.

This method of the carriers is open to serious objection. It involves necessarily the comparison of one road with another, and unless the two roads are in all essential particulars identical the comparison is of little value. Differences in climate, in traffic, and in operating conditions may be such as to render the comparison of little or no value. That was true in the instance presented by the carriers with the greatest elaboration and detail.

Again, the assignment of these labor items is necessarily an estimate. It may cost more to place a tie in one section than in another, or to place one kind of tie than some other kind. The expense of placing rail depends upon a variety of conditions, especially those relating to the operation of the railroad which interferes materially with all kinds of maintenance.

If the difference between early years and later years were pronounced, errors and differences like those above indicated would not

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be of great significance, and the result might still be entitled to credit. But here the difference is not great. In a case cited by the carriers, the difference deduced was only \$71.79 per mile per year, and this difference, if those roads which could not be regarded as fairly comparable were omitted, would be materially reduced. It is evident that a difference of this amount would be sensibly affected and might be entirely obliterated by the correction of some comparatively slight error in any of the above particulars.

For the purpose of testing the value of the figures given by the carriers, a comparison was instituted between these items of expenditure in the first years as compared with later years upon the same property. It is agreed that this process of solidification and adaptation takes place mainly within the first 5 years after operation begins. In the instance above referred to the figures were available in only one case for the entire period of 10 years. Comparing these items of expense for the first 5 years upon this line while the process of solidification was proceeding with the same items for the last 5 years when that process had become substantially, if not entirely complete, it turns out that the average per mile for the first period is \$322.08 and for the last period \$355.08.

The figures produced by the carriers would, but for the very nature of the thing itself, tend to demonstrate that these items of expense in the first years of operation were less than later.

The Commission's engineers have given careful attention to this matter and have expressed the opinion that no attempt should be made to state in dollars this item of appreciation, for the principal reason that no substantial basis can be found for any calculation of this sort.

The benefits of appreciation would seem to be twofold. The cost of maintaining the seasoned roadbed is in some respects less than for the unseasoned. Traffic can be handled with less hazard and with greater economy after the roadbed has become compacted and adapted to its use. If it were possible to determine the amount by which the expense of maintenance or of operation is reduced as the roadway grows older, this might or might not afford a basis for estimating the enhanced value, but it has already been seen that it is not feasible to determine this fact with respect to cost of maintenance, and it is even more difficult to obtain definite and reliable figures upon the cost of operation.

Upon the whole, the conclusion is compelled that no value can at this time be placed upon this item of appreciation. It is a fact which must be considered when a final or ultimate value for the property is stated, but it is one of those qualities which while influencing value is not susceptible of exact enumeration and appraise-

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ment in detail. What effect should be given to this item in the fixing of an ultimate value will perhaps depend upon the purpose for which that value is fixed and upon the past financial history of the property.

PRICES.

When the engineering inventory is complete it contains an enumeration of the units of all the property owned or used by the carrier for common-carrier purposes, except land. In order to show cost of reproduction it is necessary to apply prices to these units.

Manifestly such prices must cover the entire cost of the unit in place, but the unit price as stated in the schedule does not always include the cost of installation.

The Commission has established certain so-called primary accounts, into which all expenses incurred in the construction of a railroad are to be thrown. Thus under Account 1 are included all expenses of engineering; under Account 2, all expenditures for land. Account 8 embraces ties; Account 9, rails, etc. According to the rules of the Commission, the cost of the tie, up to the time when it is taken by the track-laying gang, would be included in Account 8, and the cost of the rail up to the same point in Account 9. The expense of obtaining and delivering ballast upon the roadbed ready for placing is embraced in Account 11. The cost of installing the tie, laying the rail, and placing the ballast is at the present time all included under Account 12, tracklaying and surfacing. It will be seen, therefore, that the unit cost applied in the inventory is that part of the total cost which under the rules of the Commission would be included in that primary account, which is sometimes the total cost of the unit in place and sometimes only a part of that cost. The rules of the Commission in this respect are followed unless the contrary is stated. It has been thought necessary in the work to create one new account, namely, Account 48, other physical property, to include certain expenses of reproduction which did not seem to be provided for under the accounts already prescribed.

Ordinarily the cost of a unit divides itself into three parts:

- (a) The cost f. o. b. some point, usually the point of origin.
- (b) The cost of transporting, handling, storing, etc., up to the time it is put in place, or in some instances taken out of the material yard for the purpose of being placed in position.
- (c) The cost of installation proper.

Preliminary to any discussion of prices lies the fundamental question, How are they to be determined; by what test is the reasonableness of the price to be examined? The carriers contend that the only proper evidence of these prices is the opinion of an expert. If the price of engineering be in question, then an engineer must be

called and his opinion taken. If the inquiry is upon the fair cost of grading, then a contractor must be produced, who should give his opinion upon this point.

The unreliability of mere opinion evidence is well understood by all those who have ever had experience with it. An opinion is personal to the man who gives it. It depends upon his education, his mental habit, his present mental state. It is influenced by his environment and often controlled by the objective point which he desires to reach. The same man may hold different opinions upon the same subject at different times.

Perhaps the most serious infirmity of opinion evidence is that the witness may be selected at the will of the one producing him. A fact must be established by those who have knowledge of it, who were present and saw it, for example, but an expert can be brought from the ends of the earth, and a dozen may be rejected until the right one is found. Given time and the money, almost any opinion can be had within certain limits.

After careful consideration it was felt by the Commission that it would be unwise and unsafe to depend chiefly upon the opinion of experts; that the only certain foundation upon which to rest was the experience of the past. Unit prices, for example, are being applied as of June 30, 1914. The attempt is not to determine the exact price of a particular article on that date, for that price may have been abnormally high or low, but rather to ascertain what may be termed a normal price. For this purpose it was thought that the range of prices over a period of 5 years previous, and in some cases 10 years, should be consulted. The Commission therefore passed an order, known as Order No. 14, requiring carriers to state the prices paid by them for materials and supplies of all kinds entering into the construction and operation of a railroad for 5 years previous to June 30, 1914, and in some instances for 10 years, also the cost of certain kinds of labor. The prices called for were ordinarily those paid for four different purchases each year which were indicated by the order itself and not left to the selection of the carrier. The carrier was required to state the money payment which had been made. No estimate was permitted, or, if any estimate must be made of any part of the cost, the fact that it was an estimate must be stated. This return was prepared by the carrier from its records and sworn to.

This return was sometimes verified by the accountants of the Commission and sometimes accepted without such verification. A compilation was made showing in general the average price paid by carriers for the various articles embraced. That result was usually stated in terms f. o. b. the point of shipment, and in this way was

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obtained the average price paid by the principal carriers of the entire country for a given article at a given point.

This average furnishes the basis of the price applied by the Commission. It is not necessarily the exact price. In addition to prices obtained from the carriers, manufacturers have been consulted and statements have been furnished by them showing the prices at which standard goods had been sold to railroads during the same period. Members of the staff of the Commission often personally interview such manufacturers and dealers with a view to ascertaining pertinent facts.

All this information is passed in review by our engineers, who finally fix the price to be applied. That price, however, as already suggested, is determined by what carriers have in reality paid, modified in some cases as may seem just. The Commission, after having worked out prices by this method and listened to the criticism the carriers made upon the same, has no doubt of their substantial accuracy. While individual carriers have paid and would have paid, had they been constructing their properties during the five years preceding June 30, 1914, prices somewhat varying from those applied to our inventories, considered as a whole the prices employed are believed to be fair. In some cases those prices have been the result of agreement between the bureau and the carriers.

The ascertainment of the cost of installation presents a more difficult problem, but one of the same kind. All labor costs involve elements of uncertainty and variability which make the ascertainment of such costs less easy, but here again it is felt that while the differences may be greater in individual cases, the general average furnishes a basis upon which the Commission may rest with confidence. The best measure of the cost of doing a piece of work on June 30, 1914, is what that work did in fact cost during the years immediately preceding that date.

The carriers were disposed to concede this, and offered to supply the Commission with a great number of completion reports giving in detail the cost of various projects. It was felt, however, that it would be impossible as a practical matter to compile and analyze all cases of this kind which would be furnished under an omnibus requisition, and that if the carrier was allowed to select there might be some possibility that the Commission would be furnished with jobs not fairly illustrative. Carriers were therefore requested to file with the bureau of valuation a list of all such projects which could be supplied, from which the bureau selected certain, chosen sometimes at random and sometimes because of the nature of the work embraced. Reports on these selected projects were made by the carriers in duplicate, one copy being sent to the engineer having

jurisdiction over the district where the work was done and the other retained in the general office. A great number of reports of this character have been received.

Carriers also furnish to the engineer in the district, without reference to the general office, certain completion reports. These are supplied sometimes at the request of the engineer and sometimes upon the initiative of the carrier. They are in all cases prepared by the carrier and are supposed to be an exact reproduction of its records.

In each district one or more accountants are delegated for the collection of cost data under the direction of the engineer of the district. These accountants examine the records of the carrier either for the purpose of verifying the information which has been furnished in the form previously explained or of obtaining new information. Whatever is taken is from the record of the carrier itself.

The reports returned to the general office as above are there compiled and digested, frequently in collaboration with representatives of the carrier. For example, many reports have been received from all parts of the country giving the cost of erecting steel bridges. These different costs are put together and averaged, usually by localities, so that the actual cost of erecting a steel bridge of a given type in recent years for any part of the whole country is accurately known. When these compilations are completed at the general office the result is sent into all the districts.

Each district maintains a cost organization of its own, which compiles in the same manner cost data collected by that district and not returned to the general office. The result of this compilation in the district is usually transmitted both to the general office and to the engineers of the other districts.

It will be seen, therefore, that when the engineers of a particular district are called upon to price an installation they have before them the record of what it has cost to do similar work in numbers of cases. They are themselves men of experience and of judgment who have built, bought, and installed the kind of material or apparatus under consideration. They are practical men who bring to the question before them judgment ripened by experience. They are actuated by the sole desire of applying a proper price.

The price so applied is mainly dependent upon past experience, but it is not a mere mechanical average. Both the engineers who supervise the compilation and those who apply the price are familiar with the subject and property under consideration. While the price depends upon the cost data and can be relied upon in proportion as it is supported by such cost data, it must be such as commends itself to the judgment of one qualified to judge.

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Costs arrived at in this manner will not exactly coincide with the original prices paid; some will be higher and some lower than those which obtained on original construction. A stroke of hard luck may inflate the price; there are wet seasons and dry seasons; organization and coordination profoundly influence cost. Labor conditions may be entirely different. All this may affect individual prices, but it is believed that the general price arrived at by the foregoing method can be used with confidence in reaching a reproduction estimate for railroads as a whole. This method is better than mere expert opinion, for the opinion of the expert is valuable in proportion as his experience has been broad and universal, while here we have the experience not of one but of hundreds of experts.

As already noted, the cost of the material handled is ordinarily at the point of purchase. To this must be added the cost of transportation to the point of installation. Ordinarily the commercial freight rate is applied up to some point upon the line under construction, but to this rule occasional exceptions occur. It is sometimes found that no commodity rate applicable to the transportation of rail is in effect over a portion of the line, the only published rate being the class rate. In such case what is believed to be a reasonable commodity rate is used. If the transportation over the line under construction is by rail a haulage-charge estimate at the rate of 5 mills per ton-mile is usually made. For wagon haul the charge is varied with the conditions of service.

In estimating cost of reproduction the existence of all present lines of transportation except the railroad under reproduction is assumed. When the Northern Pacific was constructed no other line of railroad operated in its vicinity over most of the distance; to-day for a considerable part of the way that line is paralleled by the Chicago, Milwaukee & St. Paul. It will be recognized that freight for the construction of the Northern Pacific can be handled over this line.

It was necessary in the building of the Central Pacific to construct expensive wagon roads for the purpose of hauling the necessary materials. To-day those are highways maintained at the public expense and are available. Whenever it would be necessary to build a road not in existence, that expense is included in the price.

Our inventories are taken as of different dates, but all prices are applied as of June 30, 1914. The first thought was to apply prices as of the date of the inventory in each case, but subsequent reflection led to the conclusion that this course could not properly be pursued.

The railroads of this country are competitive. If the costs which are being produced by the application of these prices are to be influential in the fixing of rates, they ought to be upon some common basis. Without attempting to indicate how far changes in prices

should affect changes in value, it is manifest that all carriers ought to be, if possible, measured by the same standard.

The fluctuations in price which have occurred since June 30, 1914, illustrate and confirm this view. Many prices, especially of equipment, are to-day double those of 1914. It would, in our view, be manifestly absurd to apply to the Pennsylvania lines between Washington and Philadelphia, of which the date of valuation is 1914, prices as of that date, while applying to the Baltimore & Ohio, a parallel line constructed at substantially the same time and developed under the same conditions, the prices of June 30, 1918, which happens to be the date of its valuation. If a uniform price be applied that price can be varied by appropriate factors or otherwise as justice may require.

Under that provision of the act which requires the Commission to keep informed as to changes in the operative property of carriers, the Commission has passed an order requiring every carrier to keep an account in detail by jobs of all additions to the property and of all retirements. These accounts are to be kept by valuation sections. It will therefore be possible for the Commission to know what additions to the property have been made and the price in fact paid for those additions since 1914. The order in its present form did not become effective until July 1, 1917, so that there may be a brief interval in the case of some carriers since June 30, 1914, as to which additions and betterments can not be given in detail; but this is of slight importance, since there was no material variation in price during most of that period.

While the Commission is not as well informed to-day as it hopes to be before the end of its work, we are prepared to state with considerable confidence that the cost of producing and equipping a railroad in most parts of this country on June 30, 1914, was a fair average for at least the 20 years preceding. There had been many changes during that period. Some prices had advanced while others had declined. The cost of labor had somewhat increased, but improved methods tended to offset this increase. On the whole, the 1914 cost was just about an average for those previous years during which the great bulk of the railroad property then in use had come into existence.

The inventories are taken as of June 30. A few are as of 1914 and there will be a few as of 1919, but most are for 1915 to 1918, inclusive. When these inventories are completed and when the returns to Order No. 3, which calls for additions and betterments, have been made, it will be possible to show what items have been added since the present inflation of prices began and the amounts actually expended.

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OVERHEAD CHARGES.

When an inventory has been prepared, including every item of physical property which enters into the construction of a railroad, and when a proper price has been applied to every item in that inventory covering both the expense of acquiring the property and of putting it in place as a part of the railroad, the result does not express the entire cost of the physical railroad itself for the reason that certain expenses connected with the production of this property have not been taken into account.

Before the building of the railroad or even the preliminary steps looking toward its building can be undertaken, a corporation is organized. There must be some entity to hire men and disburse money. The creation of this corporation entails the procuring of legal services and generally the payment of certain fees and other expenses. Engineers must be employed to locate the line, prepare contracts, supervise the construction, etc. There must be a general organization with the necessary employees for the purpose of conducting the work and making record of the details. Money must be provided for the payment of expenses as the work progresses and the interest on this money is in addition to the capital invested. It is evident that these items and others of a similar character call for the outlay of money, and that they are not represented in the inventory which has been prepared and priced. These items are ordinarily denominated "overhead charges" for the reason that they attach, not to any particular structure or part of the work, but to the work as a whole or at least to a certain class of that work.

It must be conceded that a railroad could not be built without expenditure for some or all of these items, and that if the cost of reproduction is to be indicative of the cost of production at present some inclusion must be made on this account. Such overhead expenses have universally appeared in the past in all reproduction estimates, but while the propriety of the allowance has been universally admitted, the amount has varied greatly and opinions are not uniform as to the items themselves for which it should be made. The aggregate of these overhead charges has run in well-considered reproduction estimates from 10 per cent to 30 per cent of the total of the inventory. If it be assumed that the inventories of the physical property of the railroads of the United States would aggregate \$15,000,000,000, 20 per cent, the difference between the extremes above stated would amount to \$3,000,000,000. It will be seen, therefore, that from a money point of view it is of great importance that these charges should be intelligently considered. Seemingly in the past the amount of these charges has depended rather upon

the impression of the engineer who applied them than upon any well ascertained basis of fact. It has been the attempt of the Commission to reach a conclusion grounded, not upon impression or inclination, but upon a substantial foundation. The attempt has been made to bring these charges under the same test which has been applied in the development of prices, namely, the actual experience of the past. The conclusion reached and the reasons for that conclusion will be given under the different items which are here classed as overheads.

CONTINGENCIES.

In many estimates of the cost of reproduction in the past some sum has been included in the nature of an overhead charge for contingencies. This has generally been computed as a percentage and has varied from 2 per cent to 10 per cent. Sometimes the same percentage has been computed upon both road and equipment accounts while in other cases a larger percentage has been used for road accounts than for equipment.

Carriers have continuously insisted that an allowance of this kind is proper and necessary and that it should be not less than 5 per cent nor more than 10 per cent. They unite in giving one reason for this opinion. It was said by them that in estimating the cost of constructing a new railroad there should be added this percentage for contingencies, and that the same addition must be made in estimating the cost of a hypothetical reconstruction. The accuracy of this conclusion may be tested in the light of undisputed facts.

When the building of a railroad is in contemplation the engineer locates his railroad, ascertains what facts he can as to physical and commercial conditions under which that railroad is to be built, makes his surveys, draws his plans, and from these surveys and plans determines the quantities which will enter into the construction of the road. He then applies to those quantities what he believes to be a proper price, and thereby shows the total expense of building the railroad. The accuracy of this estimate will depend upon the character of the man who makes it and the care with which it is made; but even though the engineer be competent and the work done with care it is still found necessary by experience to add to the estimate from 5 to 10 per cent for contingencies to cover matters which have not been foreseen. No question can be made that the prudent engineer and the prudent investor will do this, and that experience demonstrates the practical necessity for such an addition. But what are the reasons for this allowance, and do those reasons apply in case of a reproduction estimate?

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There are perhaps two general classes of items which justify the estimate for contingencies in case of the road to be constructed. It is almost inevitable that some things will be forgotten which are finally necessary to the completion of the property. If a complete detail of the construction expense as actually incurred be compared with the detailed estimate, it will be found that certain items in the former do not appear in the latter. These omitted items make up a considerable part of the estimated cost of contingencies.

In the building of the railroad unexpected difficulties are encountered. The character of the excavation is not what was anticipated. Rock is found where earth might have been expected. Quicksand may develop, which will add largely to the cost of the work. Bridge piers must be given a greater depth of penetration than was indicated by the borings and soundings. These and numerous other unforeseen conditions add to the total cost of the work.

Neither of these two classes of items which make up the greater part of the sum total of contingencies in new construction is present in the estimate of reproduction. The road has been constructed. Every item which enters into the property is present and can be inventoried. Those things which are omitted in the estimate of original construction are all here in case of the completed property. The first class of items, which renders an estimate for contingencies imperative in case of new construction, disappears in case of reproduction.

It may be said, although that claim has not been very clearly urged by the carriers, that it is impossible to enumerate all the items of property which enter into the construction of a railroad, and that some sum must be included to take care of inevitable omissions. While this might be so in case of an inventory hastily taken, it is not true of the inventories made by the Commission pursuant to the valuation act. To an extent the Commission's inventory is made in the first instance by the carrier and checked by the Commission. This is true of equipment. The carrier furnishes a list of its rolling stock of all kinds, and that list is verified by the representatives of the Commission. It is significant as bearing upon the accuracy of the work that up to the present time in no case has there been any dispute between the carriers and the Commission as to the units of equipment which the carrier owns. Further investigation by the Commission's engineers has shown that many such units which appeared upon the records of the carrier as in existence were no longer in service, and in some instances equipment has been identified which did not appear upon the records of the carrier; but in the end there has been a complete agreement between the carrier, the engineer, and the accountant, all approaching this subject from different points of view.

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The carrier is also required to make an inventory of its larger machines. It is allowed to estimate, if it chooses to do so, its small tools. If such an estimate is made, as it should be and usually is in some form, it is evident that it will not be absolutely accurate, but the variation from the fact is just as likely to be in favor of the carrier as against it. In other words, the element of doubt which exists in that part of the inventory ought not to be corrected by an addition for contingencies.

The inventory of other portions of the property, particularly the roadway, is conducted upon a different basis and is in some sense the joint product of the bureau and the carrier. The carrier makes careful preparation in advance of the taking of the inventory. The pilot of the carrier, armed with this advance information, accompanies our parties for the purpose of pointing out the property to be inventoried. Carbon copies of the field notes are in all cases furnished the carrier if desired, and to the record which those notes contain objection can be made by the carrier and the matter subsequently investigated.

There are certain quantities which are hidden and can not be observed. In the inventorying of those quantities the representative of the Commission must rely largely upon the statement of the carrier, supplemented by such records as it possesses. In ascertaining the thickness of a retaining wall, the depth and size of foundations, the original ground line in case of excavation, pipes and drains underground, etc., the statements of the carrier are necessarily accepted unless they are manifestly wrong.

In the making of an inventory in this way the liability to error is rather in favor of the carrier than against it, since as to matters which can not be observed and known the statement of the carrier is necessarily accepted. It would be utterly wrong to make an addition for contingencies for the purpose of correcting an omission in an inventory made up as this inventory is, for while it is not absolutely accurate, there is no manner by which it can be determined in whose favor the error is.

What is true of omissions in the estimate of original cost is equally true of those unforeseen happenings and conditions which in preliminary estimates must be taken care of by an allowance for contingencies. The engineer in the making of his original estimate may overlook many of the difficulties to be encountered; the engineer in estimating cost of reproduction has before him every one of those difficulties. If the sounding rod struck what appeared to be solid rock but was in fact a boulder, and if for that reason the pier must be sunk 20 feet deeper, this is known to-day.

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An instance was brought to attention where in the addition of a second track quicksand developed which required a large amount of expensive excavation, the replacing of solid earth where the quicksand had been, and the construction of an expensive mattress to be used in that connection. It was said that this was a contingency. So it was in the original construction of the property; but to-day the thing done is there and the cost of doing it will all be estimated in reproduction. No second allowance should be made by way of contingencies.

Plainly, the reasons for a contingency allowance in case of new construction do not obtain in case of reproduction, and since the reason upon which the opinion of all these witnesses was based fails, the opinion itself must go for naught.

It should be further noted that certain matters which might be termed contingencies are taken care of in the price. This is illustrated by the building accounts. In determining the reproduction cost of a building a bill of materials is prepared and prices are applied. To this an addition is made on account of contingencies or contractor's profit or both. This is to cover that element of uncertainty which exists in every estimate. The result is the figure for which the building could be built by the carrier or for which it could be contracted to a responsible contractor if that method were preferred. Certainly nothing further should be added to the cost thus determined on account of contingencies.

An important account in the construction of a railroad is grading. Our reproduction inventory shows the cubic yards of the various kinds of material which must be moved, common excavation, as solid rock, loose rock, etc. A price per yard is applied which is based upon known contracts; that is, upon the price which railroads have in the past paid for the moving of similar material under similar circumstances.

The contract leaves the embankment ready for the track, but it appears that in practice certain things are generally done by the grading contractor, some of which doubtless should be embraced in the grading account but are not embraced in the contract price. For example, it may be necessary to erect a temporary bridge for the purpose of carrying a highway over a cut which the contractor is opening. This is sometimes included in the contract price by the terms of the contract, but frequently, and perhaps generally, work of that kind is an extra. The same would be true of the change of a highway, the construction of a ditch off the right of way, etc.

It also sometimes happens that the embankment or the cut, after being completed by the contractor and accepted by the railroad, is

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damaged. The repairing of this damage is an additional cost which should be included in the grading account but is not covered in the contract price.

Careful studies have been made for the purpose of determining the amount of these items which are termed excess cost of grading or miscellaneous items, and it is found that this sum varies, depending upon the character of the property, the locality, and various other conditions, from practically nothing up to 3 or 4 cents per cubic yard. An attempt is made in every case to include a proper amount on this account in the price of the grading itself. Where the grading account has been made up in this manner certainly nothing should be added for contingencies.

In some of the primary accounts there is no contingency. This would be so of rail. It would be true of ties if properly handled and cared for. Wherever there is a liability to loss that fact is taken into account. In the laying of rail, for instance, a certain number of spikes will be lost. The carrier to produce a mile of track must purchase more spikes than will be found in the completed track, therefore the quantity of spikes actually found is increased sufficiently to cover the quantity which must as a practical matter be purchased. The same sort of an allowance is made in other cases where necessary.

The chief insistence of the carriers in favor of this inclusion is that inasmuch as it has been commonly allowed in the past it should be made here. But this would by no means follow. Such an addition might perhaps be made in case of a superficial inventory, where omissions and oversights would be expected, but not in one made with greater care. Much would depend upon the method by which prices were determined. Nor can it be said that the methods and practices involved in the valuation of railroad properties in the past have yet reached that state of permanence which entitles them to the rank of authority.

It is truly said that in the building of a railroad all sorts of unforeseen contingencies occur. There will be accidents which could not be forecast. Floods may come. Strikes may occur. Many things may happen which will increase the cost over what it would have been under perfectly normal and favorable conditions. It must be remembered, however, that our prices have been determined with respect to the actual experience of the past, and this experience includes every item of the sort referred to. Accidents, washouts, labor disturbances, everything of that kind have occurred in years gone by and have been paid for by the carrier in the production of the property.

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Our price is often based upon the contract price under which work has been done, and it is said that the contractor has frequently lost money. One contractor may lose money and another contractor may make an undue amount, but on the whole the contract price is that price which experience has shown to be a fair one and which contractors of judgment are willing to accept. No contractor would name a price which did not include all the elements of chance above named and many others. There would be no propriety in allowing a second time for contingencies of that class which have been once compensated for in the price applied.

The question is not what has been done in the past, but rather what ought to be done now. After careful consideration the Commission has felt that much more reliable results would be obtained by giving due weight to this element of doubt at the specific points where it occurs rather than by making some general addition applicable to the entire inventory. No general allowance has therefore been made for contingencies under that name.

ENGINEERING.

The engineer plays a prominent part in the building of a railroad. His services antedate the work of actual construction and continue throughout construction and into operation. Expenditures for engineering have always been assigned to a separate primary investment account.

In determining cost of reproduction it has been the general practice in the past to include a gross sum for engineering in the nature of an overhead expense. Some of the state commissions have claimed that this is not correct; that while perhaps a certain part of engineering cost may be treated as an overhead, the bulk of it should be assigned to particular structures.

A certain portion of the engineering expense incurred in the building of a railroad, and which must be incurred in the reproduction of that railroad, could not be allocated to particular items of property. This is manifestly true of that preliminary engineering outlay which precedes the beginning of construction and which is very considerable in amount.

During the progress of construction the chief engineer and his immediate organization are engaged in general supervision of the engineering work upon all parts of the property, and manifestly that engineering expense could not be allocated.

To an extent the cost of engineering peculiar to certain structures might be known. An engineer may be assigned to the building of a bridge or a tunnel. This, however, is unusual, since in actual practice the same engineer will supervise all the work upon a particular

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section of the road or the work of a particular kind upon a given section. It would be difficult to assign to a given structure the amount of his salary and expenses which actually belongs there. In point of fact the accounts of carriers in the past have seldom been so kept that it would be possible to make such an allocation of engineering cost to any considerable extent.

The conclusion was reached after the most careful consideration with the engineers of the Commission that to attempt to allocate the cost of engineering to particular pieces of property would be a refinement not practiced in the past, not called for in the present work, and which for lack of supporting data would introduce an element of greater uncertainty rather than greater certainty. It was therefore determined to adopt the almost universal practice of the past and to treat engineering as an overhead charge which could be properly stated in a single gross amount.

For the determination of this amount two methods are open, the synthetical and the historical.

Under the synthetical method an attempt is made to determine the amount of engineering service which will be required and its cost. A construction program is mapped out; the number of engineers required is determined; their grade and salaries are fixed; the length of their service is stated; and in this way the total amount of the expenditure is arrived at.

This method was employed by the bureau of valuation in case of all properties first valued, with unsatisfactory and inconclusive results. The objection is that no supporting data can be found. Reliance must be placed entirely upon the judgment of the man who makes the estimate. It is not possible to bring that judgment to the test of experience as disclosed by the records of the carriers.

The historical method inquires what this expense has been in the past and seeks to determine in this manner what it would be to-day. For years engineering has stood as primary Account No. 1. It is one of the few accounts which have never been changed. It has been easy to distinguish those items which should go into this account. The cost of engineering is therefore known with substantial accuracy as to many railroad properties.

In estimating the cost of new work it is customary to add a percentage of the total cost for engineering. In estimating the cost of reproduction in the past the same practice has been followed. While carriers have made some objections to the use of the percentage method, no substantial reason has been given for that objection.

Assuming that engineering is to be computed as a percentage, upon what base should it be reckoned? Should the entire cost of the prop-

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erty be taken or should the percentage be applied to certain items of cost?

The investment accounts of a railroad are divided into three general classes—road, equipment, and general expenditures. It is evident that there is no connection and therefore no necessary relation between engineering and general expenditures. This class of accounts should therefore be omitted in computing engineering.

In some cases engineering accrues as an expense in connection with equipment and in others it does not. With smaller roads and with many of the larger roads equipment engineering is furnished by the builder and becomes a part of the price paid for the completed article. It often happens, however, that equipment is furnished according to specifications prepared by the carrier, and this involves an item of engineering expense. Considered as a whole, the proportion of engineering cost assignable to equipment is almost negligible.

The relation between the cost of equipment and the cost of the roadway varies greatly with different properties. There is no definite relation between the cost of engineering and the cost of equipment, and therefore equipment should be disregarded in seeking a satisfactory base for the computing of engineering as a percentage.

This would leave the road accounts only, and from these engineering itself should be excluded. The same is also true of land in connection with which there is little or no engineering proper.

It would seem, therefore, that the road accounts, exclusive of land and engineering, afford the most reliable base for the computation of engineering as a percentage.

Having determined that engineering is to be stated as a percentage upon the road accounts, exclusive of Nos. 1 and 2, how shall the amount of that percentage be determined? If possible, the same method should be followed here as in the determination of prices. If the cost of engineering in the past can be ascertained, that should be used as a guide in the making of this reproduction estimate.

It is possibly true that this item in the investment account of an old railroad which has attained its present stage through a process of development extending over several years may not represent what it would cost for engineering if that road were to be constructed *de novo*. The accounting rules of the Commission do not permit a carrier to include in the cost of a betterment or addition to its property anything on account of engineering service rendered by the operating engineers of the carrier. It usually happens that railroad systems of considerable size employ engineers of ability as a part of their regular operating force, and these engineers exercise a certain amount of supervision over additions and betterments to the property. To an extent, therefore, engineering is not included in the cost

of these subsequent improvements and does not appear in the total of Account No. 1. But with pieces of new construction, especially if that construction is by independent companies, the cost of engineering is generally authentic and reliable.

For the purpose of determining what was fairly indicated by the experience of the past the Commission took a great number of pieces of construction which had been completed within the last 10 or 15 years and deduced the percentage ratio borne by engineering to the road accounts exclusive of Nos. 1 and 2. The result was reasonably satisfactory. There were a few cases where the per cent fell below 2 and a few others where it rose above 5. An examination of these cases showed that there was something either in the character of the project or the manner in which the work had been done which excepted them from the normal. In the great majority of instances the percentages ranged between 2 and 5. When plotted upon a chart it was found that the bulk clustered around 3.5 per cent and the average of all was 3.6 per cent.

The carriers collected a great amount of similar evidence. The average result shown by the instances which they compiled was something over 4 per cent, but the number of carriers embraced in their exhibit was much less than those considered by the Commission, and it was felt that the exhibit was not equally representative and that the average was not a fair one.

Upon the strength of this investigation the engineers were instructed to compute engineering as a percentage of the road accounts, excluding Nos. 1 and 2, and that the percentage so included should not be less than 2 nor more than 5 per cent. If an abnormal case arises in which the engineer believes a greater or less sum should be estimated, he will list that case for special discussion and determination.

It may be inquired how the engineer will determine where to fix his percentage between these limits, and the answer is obvious. He must consider the nature of the property with which he is dealing. If the railroad runs through a comparatively level country, crossing few streams, and therefore with few bridges, slight cuts, and no tunnels, the percentage of engineering would be comparatively low even though the cost were also small, but as the difficulties increase the percentage would rise. It must be noted, however, that the percentage may be comparatively low, although the engineering difficulties are many, for the reason that the total cost of the work is large and the percentage of engineering therefore small, although the gross amount of engineering is itself large.

In fixing this percentage the engineer also frequently derives great assistance from what he can ascertain as to the original cost. This

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is by no means conclusive, but it is always instructive and when ascertainable is carefully considered.

Engineering has not been depreciated. It is a labor charge and ordinarily labor depreciates along with the article into the cost of which it enters, but for the reasons named below this rule has not been applied to engineering.

Of the remaining expense the most considerable part is assignable to the providing of the structure upon which the ties and rails are installed. Of this structure the greater part appreciates rather than depreciates. The bridge and the culvert deteriorate but under proper maintenance the embankment does not.

In view of the difficulty of distinguishing between that engineering which was assignable to the location and laying out of the property and the allocation of the remainder to that part of the property which did not depreciate, it was deemed best to treat the entire item as nondepreciable, and this course has been followed.

GENERAL EXPENDITURES.

Under general expenditures are included those items of expense which can not be assigned to any particular article of property, like the expense of organizing the corporation, legal expenses, etc. These expenditures are from their definition overheads and are always allowed as such. Interest during construction is properly a general expenditure and is usually treated as such, but in our work interest is considered by itself and all other items of general expenditure are thrown into a single item for the reasons stated below.

The accounts embraced under general expenditures according to the present classification are as follows:

- No. 71. Organization expenses.
- No. 72. General officers and clerks.
- No. 73. Law.
- No. 74. Stationery and printing.
- No. 75. Taxes.
- No. 76. Interest during construction.
- No. 77. Other expenditures—general.

This classification has been in effect since July 1, 1914.

The corresponding accounts in the previous classification were as follows:

- No. 43. Law expenses.
- No. 44. Stationery and printing.
- No. 45. Insurance.
- No. 46. Taxes.
- No. 47. Interest and commissions.
- No. 48. Other expenditures.

It will be seen that the present classification does not include commissions with interest. Since commissions frequently amount to very considerable sums and since they were exceedingly variable it is evident that that account, as stated in the old classification, is of no value whatever in showing the actual expenditures for interest during construction. This, however, is unimportant, since interest is dealt with in an entirely different way in showing reproduction cost and may be entirely disregarded in the present discussion of general expenditures.

Eliminating interest, it is evident that while some of the accounts are identical, most of them are not. Those which are the same are comparatively small in amount. Under the new classification the largest account is usually No. 72, general officers and clerks. This item, as well as organization expenses, was formerly included in Account 48. Organization expenses seem sometimes to have been reckoned with law expenses under the old classification. While, however, it is impossible to find any supporting data for an allowance of general expenditures according to the present classification in the accounts of the carriers as previously kept, the general expenditures accounts as a whole include the same items to-day which were included in the corresponding accounts as a whole under the previous classification, excepting interest and commission. In view of the comparatively small amount of the expenditure in case of most of these accounts, the satisfactory way seemed to be to exclude interest and consider the balance as a whole or as one item and to inquire of the past what the amount of this item ought to be.

If general expenditures, exclusive of interest during construction, are to be treated as a percentage, upon what basis should that percentage be computed? Equipment involves a very inconsiderable part of these general expenditures which are mainly associated with the construction of the road. It has been determined therefore to put this percentage upon the road accounts exclusive of No. 2, land, which is considered as an independent item.

To determine the amount of this percentage resort was had to the same method by which engineering had been ascertained, the same projects being used. The result was not satisfactory. When the completion reports were distributed among the different engineering districts it was found that a material difference in the percentage existed. The reason for this difference could be understood upon an analysis of the figures, but every analysis indicated that in two of the districts the figures were inherently unreliable. Recourse was had to individual cases which were believed to be fairly typical of what might be expected under normal conditions, and while the percentage was not altogether uniform there was in these instances a substantial agreement.

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This item is not large in amount but it is from the very nature of things impossible of any exact estimate. Upon a view of all the facts before the Commission it is believed that 1.5 per cent of the road accounts, excluding land, would be a fair amount to estimate for all general expenditures as now classified by the Commission with the exception of interest during construction. In some states a large charter fee is required, depending upon the amount of capital stock and bonds named in the articles of incorporation, and our engineers are instructed in such cases to ascertain the amount of this fee and add it to the 1.5 per cent where it is more than nominal. In states where no taxes are levied upon railroad property during construction, that fact is considered.

General expenditures are depreciated with the accounts used as the basis for computing the percentage. As already noted, these expenditures accrue almost entirely in connection with the road accounts. While organization, and perhaps a part of legal expenses, would not properly depreciate, these are ordinarily an inconsequential part of the whole which would depreciate along with the items of property in the production of which they are incurred.

COST OF OBTAINING MONEY.

The cost of obtaining the money with which to finance the construction of a railroad has been frequently and perhaps usually treated as an overhead. After mature consideration, it has been thought best in reporting cost of reproduction new to show nothing on this account as such but to include any necessary charge of that character in the interest rate.

Ordinarily a railroad corporation finally obtains the money with which to defray the expense of constructing its property by the sale of stocks and bonds, but the date at which such sale is effected depends upon a variety of circumstances. The necessary money may be borrowed on short-term paper and the bonds issued and sold at the end of the construction period. The bonds may be issued before the beginning of construction and turned out as collateral for short-term notes during construction, or the bonds may be sold in advance of the beginning of construction. An examination of the financial history of our railroads indicates that the last method has been seldom used.

Whatever method is adopted would involve a certain amount of expense. If the money were borrowed on short-term notes there would be some small charge, not exceeding 1 per cent and usually not exceeding one-half of 1 per cent, for brokerage. If the bond was sold, there would usually be a discount which would include the

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brokerage charge proper and which would depend upon the rate of interest, the length of the term, and the credit of the company.

The most important factor in determining the cost of obtaining the money and the rate to be paid for the same would be the credit of the borrower. The United States government could probably borrow the money in normal times for from 3 to $3\frac{1}{2}$ per cent. A strong railroad with the best of credit could obtain it for approximately $4\frac{1}{2}$ per cent. A weak railroad might not be able to obtain the necessary funds at any rate without financial support, for which it must pay in some form.

It was felt at the outset that it might be necessary to determine in each case the cost of obtaining this money; that is, that inquiry must be made into the credit of the company and the circumstances which would surround its financing. Further reflection, however, showed that this would be an almost impossible task, and that the result would be misleading rather than informing. On the whole it seemed best to assume that the credit available when the property was being reproduced was in all cases good and the same; that money would be obtained at the same rate and supplies purchased on equally advantageous terms. Upon no other theory would the cost of reproducing the different properties be fairly comparable.

This being settled the next question is as to the rate of interest to be adopted. Six per cent is the legal rate of interest in a large section of this country where no other rate is specified. An examination of the sale of bonds of various kinds for the five years preceding June 30, 1914, led to the belief that this rate would be ample to cover not only the interest on the money but any brokerage which would usually be charged for the obtaining of the money. It has been assumed, therefore, that at 6 per cent whatever money is needed can be obtained, and that this rate of interest will cover the entire cost of obtaining the money.

It should be noted that under the accounting rules of the Commission now in effect if bonds are sold at a discount that discount is carried into a suspense account to be amortized from year to year out of earnings or otherwise during the life of the bond. This discount, therefore, while in one sense an asset which is to be paid for by the public in subsequent years, is no part of the expense of construction or at least only to the extent of the discount which has already been amortized at the beginning of operation.

It should be further borne in mind that engineering reports do not attempt to place a final value upon properties. There may be facts in the financial history of a corporation which would make it just to consider the cost to that road of obtaining money in the determination of its final value. The financial history of every

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corporation is fully dealt with in the accounting report. The engineering report deals merely with the physical property of the carrier, and in estimating the cost of reproducing that property new it is assumed that the money can be had for 6 per cent without additional cost and without inquiring how it is to be obtained.

INTEREST DURING CONSTRUCTION.

A considerable time is required to construct and put into operation a railroad. The expense of building and equipping that railroad must be met as the work proceeds. For the use of the money required for this purpose from the time it is obtained by the company up to the period when operation begins interest must be paid, and it is universally conceded that this interest is an item of expense in the construction of the property which should be included in a reproduction estimate. Such an item is provided for by the accounting rules of the Commission. The debatable questions are as to the rate and length of period for which interest is to be computed.

It has already been stated in the previous discussion upon the cost of obtaining money that 6 per cent is the rate to be applied and that this rate is taken as including all other costs in connection with procuring necessary funds for construction.

In the valuation of railroads, it has been customary in the past to allow interest upon the entire reproduction cost of the railroad for one-half the construction period. This is apparently done upon the theory that expenditures would run over the entire period of construction at about the same rate.

The equipment of a railroad very often makes up a considerable part of its entire cost. This is not usually purchased until the road is practically completed, and but little, if any, interest is paid on expenditures on this account up to the time that operation begins. For this reason it did not seem proper to treat payments for equipment the same as payments for other items of construction, and it was finally decided to allow in most cases interest upon equipment for three months.

Disregarding, then, the item of equipment, we come to inquire for how long a time should interest be computed upon the balance of the expenditures and upon what accounts?

Land is not included in the engineering report nor do we attempt to show the cost of reproducing the operative lands of a carrier. Interest should not therefore in this connection be computed on Account No. 2. It should apparently be reckoned upon all the road accounts except this and upon general expenditures except interest during construction.

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The length of time for which this interest should be reckoned is one of the most difficult questions connected with this whole reproduction estimate. Carriers have usually insisted upon a long period, and in the very nature of things there is no exact standard by which the issue can be determined. With a view to obtaining such information as is available a careful study has been made of the records of the carriers for the purpose of ascertaining what time has been actually required in the past. From these studies it clearly appears that there are two construction periods. There is, first, a preliminary period during which the feasibility of the enterprise is frequently under consideration and which covers preliminary and location surveys. This period is extremely variable, being in some instances only a few months, while in case of other properties of the same extent several years have been spent. The expenditures during this period are insignificant as compared with the whole and the better plan has seemed to be to entirely disregard this preliminary work, both in stating the construction period and in the computation of interest, and to treat the relatively small amount of interest which may be considered as accruing during the preliminary period in connection with and as covered by the estimate for the construction period.

After the preliminary period comes the period of actual construction, which in our work has been treated as the construction period. With respect to the length of this period the following two observations may be made:

(1) An examination of the construction history of many railroads shows that construction has seldom proceeded as rapidly as it might economically have done. Delays have been due to a great variety of causes, but oftenest to financial difficulties. For this reason the period of construction as it in fact existed in case of particular properties is not necessarily a fair measure of what the construction period for those properties should be, nor is the average construction period a fair test.

The construction period as determined by our engineers is not supposed to represent the shortest time in which the railroad could be constructed, but rather that period within which the work might be economically done. The usual delays which occur on the average in normal times due to labor and market conditions are assumed to exist, but unusual delays due to financial troubles and to other causes peculiar to individual properties are eliminated.

(2) All existing means of transportation aside from the property itself which is under reproduction are assumed to exist. A given railroad is usually crossed by several different roads, which makes possible the bringing in of men and materials at these junction points. This enables the engineer to proceed with his hypothetical

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reconstruction at several different places at the same time. Assuming that conditions are the same along the entire line, a road 300 miles in extent might be reproduced in nearly the same time as a road 100 miles long.

This assumption often very much reduces the period allowed for reconstruction below that historically required for the building of the property. The Northern Pacific has been already referred to in this connection. When that road was built it ran through miles of territory where no other railroad existed. Materials and supplies must be carried into that country over its own line. The first 100 miles must be constructed before the second 100 miles could be fairly begun. To-day the Northern Pacific is paralleled for many miles by the Chicago, Milwaukee & St. Paul, so that men, supplies, and materials of all kinds can be delivered at many points along the entire line. This renders it possible to prosecute the work simultaneously at many points and very much reduces the total construction period.

An examination of the history of the construction of many pieces of railroad shows that when construction has been begun and prosecuted continuously the monthly expenditures are distributed with comparative uniformity over the entire period. As already suggested, construction is frequently delayed and interrupted from various causes, and there are certain sections of the country in which, owing to climatic conditions, construction is necessarily for the most part suspended during a portion of the year, but considering the country as a whole it may be said that expenditures are about evenly distributed throughout the period of active construction.

If, therefore, it were to be assumed that interest should be reckoned upon every expenditure from the day when it was made to the day when the road is opened for operation, it would be correct, disregarding interest on interest, to compute interest upon the full amount for one-half the construction period.

It has been felt, however, that it ought to be postulated that the carrier as it enters upon and proceeds with the construction of its property should have on hand a certain amount with which to meet its expenditures in advance of the exact day when they mature, and it has seemed reasonable to assume that at the beginning of each six months the carrier has available sufficient funds to cover the expenses of that period. This would mean that funds would be furnished the carrier three months upon the average in advance of their expenditure and that interest should be computed for one-half the construction period plus three months.

It is felt that this will include interest on expenditures made during the preliminary period the amount of which, as already suggested, is insignificant in comparison with the total outlay..

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There is also an item of interest on interest which increases as the length of the construction period lengthens, but it is believed that the interest which the carrier should obtain upon its cash balances in bank ought to be sufficient on the whole to offset this item. Interest is therefore computed upon the road accounts, except land, and upon general expenditures, except interest during construction for one-half the period of actual construction plus three months, and upon equipment in ordinary cases for three months.

The construction program adopted does not contemplate any commercial operation of the railroad during the assumed reproduction period, and therefore no sum is to be estimated either as a debit or credit balance for Account No. 40, revenues and operating expenses during construction.

DISTRIBUTION OF PROPERTY BETWEEN STATES.

The valuation amendment requires the Commission to "show the value of the property of every common carrier as a whole, and separately, the value of its property in each of the several states and territories and the District of Columbia, classified and in detail." The engineering report does not deal with value proper and the above requirement is construed to refer to the cost and other facts with respect to the property with which that report does deal.

A large part of the physical property of a railroad is fixed. This is true of its roadbed and its buildings of all kinds. As to the location of all this property no doubt can exist.

Certain other property is movable and might be carried from state to state, but in fact its use is ordinarily confined to one place. Of this, roadway small tools and shop tools furnish illustrations. While they might be and sometimes are used interchangeably in different states to a very limited extent, their use is ordinarily confined to a single locality. Property of this sort is clearly located in the state where it is used.

All property of the above classes is included in the road Accounts Nos. 1-47 and no property embraced in those accounts can be fairly regarded as having a situs in more than one state, except Account No. 37, roadway machines. These machines, usually mounted on wheels, can be readily transported from point to point over the line, but here again in actual practice their use is generally confined to the limits of a particular state when the length of line in that state is considerable. On the whole, it has seemed well enough to treat all property embraced in these road accounts as having a definite situs in that state where it is ordinarily used.

It will be remembered that the inventory is made by valuation sections. No valuation section is ever allowed to extend across a

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state line. If, therefore, all valuation sections in a given state are summarized, the summary exhibits the total fixed property found in that state and the various inventories exhibit the details of that property. Overheads reckoned in percentages, as previously described, are applied by states and are embraced in the summary so that the total cost of reproduction new and reproduction less depreciation is given by states as to the property embraced in the road accounts and also as to general expenditures.

The equipment of a railroad is readily interchangeable between different parts of its line and it is habitually so interchanged. Its engines are usually confined to its own line, but freight cars habitually, and passenger cars frequently, pass onto the lines of other carriers. This equipment has, therefore, no situs dependent upon its use.

To the above rule there are some exceptions. A switch engine, for example, is ordinarily employed, for a considerable period at least, in the same yard. The type of an engine may designate it for a particular use which as a practical matter confines that machine to one state, but on the whole it seems necessary to treat equipment as a thing without location.

Instances will frequently arise where the use of floating equipment, Account No. 56, and possibly of motor equipment, Account No. 55, may fix the situs of the property, but, broadly speaking, nothing included in these equipment accounts has a location in any particular state and can only be assigned on some arbitrary basis.

The language of the act is "property in each of the several states, etc." Literally interpreted, the Commission is by this required to show the property located in a particular state. If the property has no location it does not fall within the requirement; that is, the Commission is not required to create, nor would it be justified in attempting to create by any arbitrary rule, a location which does not in fact exist. It has been determined, therefore, not to attempt to allocate by states property embraced in the equipment accounts, but to report that in one item as nonassignable.

The correctness of this conclusion is confirmed by the reflection that any distribution of equipment must be made by some standard varying from year to year and not ascertained or ascertainable by the observation of our own engineers. Such distribution must depend upon use; that is, upon engine-miles, car-miles, ton-miles or some other statement of movement either with or without the loading. A distribution on this basis would not be permanent, and the information itself must be derived from an examination of a class of records which are not the subject of investigation in any branch of the present undertaking.

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Much more troublesome is the suggestion that the value of certain important structures ought to be distributed to portions of the property in states other than that in which the structure itself is located. The passenger terminal of the Pennsylvania Railroad in New York City well illustrates this. Here was an expenditure on Manhattan Island of more than \$100,000,000, although but a comparatively few miles of the Pennsylvania system are located in the state of New York. That station really benefits the entire Pennsylvania system. It was built for the purpose of enabling that system to take a more commanding position in the handling of passenger traffic between the east and the west. If a passenger takes the Pennsylvania lines from New York to St. Louis because of the existence of this station when otherwise he would have gone by some different route, the Vandalia benefits from that fact as much as do other parts of the through line in proportion to its earnings. When, however, any basis for such distribution is sought, the impossible nature of the problem of distribution appears, and above all the express language of the act seems to forbid. This station is in the state of New York and should be so reported.

Carriers frequently own small amounts of property located off the line in states through which the railroad itself does not run. Furniture in an off-line office would afford an illustration. This property is collected in one item and reported as nonassignable. A schedule of such property showing its location appears in connection with the engineering report, but no attempt is made in the report to distribute the items among the different states.

While a literal interpretation of the language of the act might call for an assignment of this property to the state in which it is in fact located, it has been thought that a practical and sensible interpretation of the act would not so require. If it is desired to know exactly where this property is, the detailed schedule can be consulted.

THE LAND SECTION.

The property of a railroad company may consist and usually does consist both of that which is used for transportation purposes and that which is not devoted to the public service but is strictly private property. The valuation act requires the Commission to report the entire property, both that which is used for transportation purposes and that which is not. The former is usually denominated carrier, the latter noncarrier.

The property of the carrier may again be divided into physical and nonphysical, the latter consisting of stocks, bonds, cash, etc. The engineering section, as already stated, deals with the physical property which is devoted to transportation purposes with the ex-

ception of land. The land section deals with lands and, in case of noncarrier property, with all structures upon or connected with the land, including noncarrier structures upon carrier land.

The Commission is required to report the original cost and present value of noncarrier lands. In doing this the land and the structure are treated together. In no other way could a correct value be determined, for it often happens that the value of the land represents the entire value of land and structure, the structure not being of a character suited to that place, and, upon the contrary, it may sometimes happen that land and structure together are not worth what the structure alone cost or what it would cost to reproduce the same. The land section may call upon the architects of the engineering section for assistance in valuing the structure, but the total value is not ascertained by adding together the reproduction cost less depreciation of the structure and the value of the land. What is reported is the market value of land and structure as they stand.

It will be seen, therefore, that the first step in the land appraisal is to determine what lands are used for transportation purposes and what are not, and this frequently involves questions of much difficulty. The act requires that lands "owned or used for the purposes of a common carrier" shall be classified as carrier. Does this word "owned" refer only to lands which are owned by a carrier and used by it or some other carrier for transportation purposes or may a carrier own for transportation purposes lands which are not actually used for such purposes; in other words, can lands which have not been in fact devoted to common-carrier use be classified as carrier lands?

One of the most serious difficulties with the present railroad situation is lack of proper terminal facilities. Railroad managers have not foreseen and properly provided for that great development of business which has not only rendered existing terminals inadequate, but which frequently renders it necessary to entirely discard such facilities and provide new ones in different locations. Owing to the great increase in the price of city lands it is usually extremely expensive to procure the land rights needed for this development.

Any rule which would discourage railroads from exercising proper foresight in the purchase of lands which will be needed for terminal facilities in the future development of their properties would be most unfortunate, for it would not only tend to prevent the providing of the requisite facilities when necessary but would much increase the expense of those terminals when provided. At the same time to give to a carrier the unlimited right to purchase and hold at the expense of the public lands in the vicinity of growing towns upon the belief that possibly at some time and in some way such

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lands will be needed for railroad purposes opens a door to much extravagance and holds out an inducement to unfortunate investment. This appears from instances which have come under the observation of the Commission in the prosecution of its valuation work. While a liberal rule should be adopted, there must be some limit to the right of a carrier to hold or own land for transportation purposes at the expense of the public.

The rule adopted has been that lands not devoted to the public service in fact may be classified as common carrier, but this shall be done only in those cases where the public use is either actual or imminent. By "imminent" is meant that the possible use must at least be capable of definition. It is not necessary that the lands be put to this use in any definite time after their purchase, but the carrier must be able to point out with reasonable clearness the probable future use which is to be made of them. If the carrier asserts that the lands were purchased in good faith, believing that they would be required for carrier purposes, the presumption will be in favor of the carrier, but nevertheless the carrier must be prepared to state the reason upon which its belief is founded and if the reason is found untenable the land is classified as noncarrier.

It sometimes happens that the amount of land which is devoted by the carrier to a particular use appears to be excessive. For example, several acres may be used for station grounds when a much less quantity would suffice. The judgment of the carrier is usually accepted. If the land is presently used for carrier purposes the reasonableness of the extent is not questioned. Only in very plain cases would the limits fixed by the carrier be changed.

Carriers frequently permit the erection upon portions of the right of way of structures which are of a quasi-transportation character. Instances are milk sheds, grain elevators, coal chutes, etc. While these structures are owned by private parties, they perform a function of the carrier itself in that they provide a means for the receiving, storing, and handling of freight. A rental is sometimes paid for the use of this land, but this is seldom so, and often when money is paid the amount is nominal. In such cases the Commission has classified the land as carrier. Where the dominant use of the structure is private, as in case of a flour mill or a wholesale grocery store, the rule is otherwise.

Carriers sometimes provide dwellings for employees. Where the situation is such that the employee can not be properly housed without the providing of living accommodations these are treated as a part of the operative property and so classified, but where the employee could readily obtain accommodations without the assistance

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of the carrier dwelling houses and structures of this sort are classified as noncarrier.

It is evident that while certain general rules may be laid down for the classification of lands between carrier and noncarrier use, much depends upon the circumstances of each individual case. The carrier is permitted and requested to state its position in every case and the presumption, as already stated, is always in favor of the judgment of the carrier when that appears to have been exercised in good faith. The rule with us in classifying carrier lands has been much the same as is the rule of the courts in permitting the condemnation of lands for carrier purposes.

CARRIER LANDS.

Paragraph "First" of the valuation act requires the Commission to report original cost to date, cost of reproduction new, and cost of reproduction less depreciation of each piece of property owned or used by a common carrier for its purposes as a common carrier. If this paragraph stood alone it would clearly impose upon the Commission the duty of reporting the cost of reproducing the operative lands of the carrier.

Paragraph "Second" enumerates in detail the things which are to be reported as to the operative lands of the carrier. It is a maxim of statutory construction that a general provision may be modified by a particular provision in the same statute and when these two paragraphs are considered together it seems evident that all the facts as to which Congress required a report touching the right of way of the carrier are enumerated in paragraph "Second." If this is so, the Commission is not required to report in terms the cost to the carrier of acquiring at the present day its common-carrier lands.

This, however, is not of much practical importance, for paragraph "Second" requires the Commission to report, if not the cost of reproduction, at least what amounts to the same thing. That paragraph, which may for convenience be repeated here, is as follows:

Second. Such investigation and report shall state in detail and separately from improvements the original cost of all lands, rights of way, and terminals owned or used for the purposes of a common carrier, and ascertained as of the time of dedication to public use, and the present value of the same, and separately the original and present cost of condemnation and damages or of purchase in excess of such original cost or present value.

The meaning of the first part of this paragraph is plain. The Commission is required to state the original cost and the present value of all carrier lands. The meaning of the last provision is obscure.

It has been suggested that the purpose was to obtain a statement of the expense to the carrier of acquiring these lands aside from what

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was paid the landowner; that is, the cost of legal fees, of salaries of real estate agents, of recording deeds, etc. But these facts, when ascertained, would not be of much significance, and such an interpretation entirely ignores the word "damages," which must also be reported. It is hardly supposable that this alone was what Congress intended.

The right of way of a carrier is frequently donated, but in so far as the carrier must acquire this by purchase or condemnation the cost generally exceeds the acreage value of the lands taken. This is partly due to the peculiar shape of the piece acquired and partly to other causes. This excess cost to the carrier is a thing of importance in the actual production of its railroad, and the carrier claims that it ought to be given weight in the estimate of reproduction. Evidently this was the fact for which Congress intended to inquire. What did it cost and what would it now cost the carrier to procure its right of way and other operative lands in excess of the market value of such lands by the acre?

If this construction is correct, the Commission is required to report as to the operative lands of a carrier the following facts:

1. Original cost.
2. Present value.
3. Cost of procuring right of way in excess of acreage value at the time of dedication to public use.
4. Cost of procuring right of way at the present time in excess of present acreage value.

Other portions of the act require certain other facts as to donations, land grants, etc., but these may be disregarded for the present.

With respect to the above items, the Commission is now reporting as follows:

1. *Original cost.*—Every effort is being made by the carrier and by the Commission to ascertain and report the original cost of lands. The carrier is required to make return showing such cost in detail and this return when received is carefully examined and verified by the accountants of the Commission. The records of the carrier, county and municipal records, court records, and any and every source of information which tends to show what the carrier did actually pay for its right of way are consulted. If it is impossible to show from the records of the carrier or from any other source what the carrier did actually pay for these lands at the time they were originally acquired, no attempt is made to estimate such original cost. In some of the earlier valuations such an attempt was made, but the result was clearly valueless and a moment's thought will show that this must inevitably be true. It is difficult to determine after a lapse of from 10 to 50 years the acreage value of the right of way at the time it

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was acquired. The sources of information which are available upon this point are manifestly of doubtful accuracy. This, however, is not the most serious objection. The lands of a carrier were sometimes donated, sometimes purchased, sometimes condemned. In the absence of records there is nothing to show the proportion in which lands were acquired by these different methods. Even if it were known that a particular parcel was purchased it would be impossible to determine the purchase price even though it be assumed that the market value of adjacent lands is correctly known, for it abundantly appears from observation and from testimony produced by the carriers that the price actually paid is not determined by the market acreage value, being usually more but sometimes less. So of condemnation; without a record of the facts it is impossible to say what damages may have been paid.

Plainly, an attempt to estimate original cost would in many cases involve, not the exercise of good judgment but rather of pure speculation. The Commission has not felt justified in expending time and money in an attempt to make these estimates when they would be not only valueless but absolutely misleading when made. ✓

Several perplexing questions have arisen in attempting to show original cost as above, some of which may be briefly referred to.

Carriers frequently purchase an entire tract, use that portion which is required for carrier purposes and either dispose of or retain as noncarrier land the balance. What shall be reported as the original cost of the carrier portion?

The first thought was to divide the cost of the total parcel upon the basis of relative areas; that is, to inquire what was the area of the carrier portion and what the area of the noncarrier portion, and to distribute the cost of the whole in proportion to these relative areas. An attempted application of this rule showed an entirely inaccurate and misleading result, for the reason that in some instances the portion used for carrier purposes was very valuable while the balance was of little value, while in other cases exactly the reverse was true.

The second suggestion was to determine the relative value of the two parcels at the time of the purchase and to divide the original cost of the whole accordingly. This involved the practical difficulty of going back to the time of acquisition and determining the value of the two parcels and this difficulty in actual experience seemed almost insurmountable. But beyond this was the further objection that when determined the result was wrong, for the reason that it entirely ignored the element of severance damages. If the carrier had purchased the portion used for right-of-way purposes by itself it would have paid more than the acreage value; indeed, it is for the

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purpose of escaping the payment of an unreasonable excess of this kind that the entire tract is purchased. To treat, therefore, as the original cost of the right-of-way portion its market value would not accurately represent such cost.

The following rule was finally adopted:

In case the noncarrier portion had been sold previous to the date of our inventory the original cost of the carrier portion was determined by adding to the original cost of the entire parcel interest, taxes, and any other expenditures shown to have been made and subtracting therefrom whatever the carrier had received for the portion sold. This result is not accurate, and in some cases the increase in value of the noncarrier portion between the date of acquisition and of sale has been such that the original cost of the carrier part is nothing, but the figure so reached does represent the money cost to the carrier as the result of the entire transaction.

Where the noncarrier part is still retained by the carrier, the accountant does not ordinarily attempt to distribute the original cost but reports the cost of both carrier and noncarrier treated as one parcel; that is, he divides all lands into three classes—

(1) Carrier lands; that is, those where the entire parcel is used for carrier purposes.

(2) Noncarrier lands, where the entire parcel is noncarrier.

(3) Parcels of which a portion is carrier and a portion noncarrier.

The original cost of each class is shown. Ordinarily the third class is not large, but is sometimes considerable. This method has the advantage of reporting the exact fact, so that the figures given are exactly what they purport to be.

The consideration in the deed does not always represent the amount paid for the land. It frequently happens that a nominal consideration is recited while an actual consideration is paid, and sometimes, although seldom, the consideration named exceeds the actual amount. The rule adopted is to disregard the consideration named in the deed and report the actual consideration when this can be ascertained either from the books of the carrier or from any other source. If there is nothing to show that the actual consideration differs from the recital, then the amount named in the deed is accepted as the actual consideration.

The Commission's accountants in their reports distinguish, however, between those cases in which the actual consideration is known and those in which it is presumed from the recital of the deed. The tentative valuation shows as donations all lands conveyed for a nominal consideration as above, but by looking into the report of the accountants it can be determined just what portion of the donations were so conveyed. It has been felt that it was highly important in

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all matters of original cost to report facts and not presumptions or estimates. Where it has been necessary to include a presumption in the final summary, it has been the endeavor to show at some previous stage to what extent the presumption has been made.

It sometimes happens that the carrier obtains its right of way upon some other consideration than the mere payment of money. It may, for example, contract with a farmer to provide a cattle pass or an overhead crossing, or a municipality may accord the right of use in its streets upon condition that the carrier shall construct viaducts. In all these cases the cost to the carrier is treated as part of the cost of its right of way where the expense would have been carried into Account No. 2 in the construction of the road, and is not so included in those instances where such expense would have been distributed among the other accounts.

2. *Present value.*—Present value as reported by the Commission is nearly synonymous with market value. What is done is to ascertain the number of acres of carrier land, to determine the market value of similar land adjoining or in the immediate vicinity per acre, and to apply that price to the number of acres. If the land has any special value for railroad purposes that is also taken into account.

For the purpose of determining this present value the Commission sends into the field its land appraisers, who make a personal inspection of the property and ascertain certain facts which bear upon the value. The right of way is first divided into zones, and each zone contains lands of substantially similar character and value. Every zone is continuous from one end to the other. The appraiser having laid out his zone next proceeds to determine the market value of adjoining and adjacent lands. For this purpose he collects all recent sales which he can find of similar lands in the immediate vicinity. He also ascertains the assessed value of such lands and finally takes the opinion of different classes of well-informed persons as to such value. From a consideration of all these sources of information he determines the unit or market value.

The work of the land appraiser involves an inspection of the land to be valued. In some instances where desert lands are under appraisement which have either little or no value, and where one mile is like every other mile, an inspection has been made from a moving train, but in nearly all instances the appraiser walks over the land to be valued and spends a considerable amount of time in inspecting similar lands, in identifying those lands for which he can obtain sales and assessments, and generally in forming an opinion of the value. Where the land under appraisal is city land

and of considerable value, a great amount of time is often expended, particularly in the obtaining of sales and assessments.

Chartered municipalities having a population of over 2,500 are treated as cities, and all lands within such limits are reported as urban. All other lands are reported as rural.

3. *Excess of original cost over market value at time of acquisition.*—No attempt is made to show this excess, for the reason that the Commission has felt it to be practically impossible to do so. The report of the accountant indicates those parcels which have been donated and those which have been purchased. Frequently several lots are embraced in a single deed for a single consideration. With respect to such parcels it is possible to give accurately the original cost of the whole but not of the individual parcel.

There are many instances where the amount paid the land owner for the parcel is known, but there are certain general costs considerable in amount incident upon procuring the right of way which can not be allocated to individual parcels. It is difficult, therefore, to give the exact original cost of any one parcel, although such cost of the entire right of way can be stated with accuracy.

To show excess of original cost over market value it would therefore be necessary to take each individual parcel and show with respect to it the fair market value of the land, combining the results into an aggregate and comparing this with original cost as shown by the records. This was actually attempted in one or two instances and it was made evident from that experience that the result could not be relied upon. To do that with respect to every parcel would involve an enormous amount of work without any beneficial result so far as we could see. The Commission has therefore felt justified in treating as practically impossible a compliance with this requirement of the statute.

4. *The cost of acquiring at the present time the right-of-way lands of a carrier in excess of the acreage value.*—This sum is not reported for the reason that in the opinion of the Commission an attempt to report it would be practically impossible.

As interpreted by the carriers, the Commission is required to take every individual parcel which the carrier must acquire if its road were obliterated and the right of way were to be repurchased, and to determine the cost of acquiring the right of way across that parcel in addition to the base or acreage value of the land used. This would be equivalent to what is done by a railroad in originally procuring its right of way and would involve a consideration of all those elements which determine the amount of the damages. The use of the parcel, the extent to which that use would be interfered with, its value before and after that railroad has been constructed,

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and the almost numberless considerations which enter into the determination of that question must be considered. An inspection and a study of each individual parcel must be made which of necessity would be more minute and exhaustive than the study which is made in determining the acreage value.

In answer to the objection that this kind of an appraisal would be in the matter of time and expense prohibitive, the presidents' conference committee, representing all the principal carriers in the United States, attempted to show the Commission how it should be done. The road selected was the Texas Midland, about 112 miles in length. Two men were selected who had no special knowledge of lands along this railroad, who were stationed upon the rear end of a passenger coach and provided with a map showing the parcels as they were originally acquired. The train proceeded at its ordinary rate over the length of the line. From this inspection these gentlemen undertook to state parcel by parcel the excess cost of acquisition and the damages. A computation showed that less than one minute could have been devoted by them to the inspection and determination of these excess costs and damages as to each parcel. The proposition that the Commission could make a report under any such method as this is too fantastic for serious discussion.

If the Commission is to report this fact and if its report is to be of any value when made, it must ascertain the fact by a detailed analysis of the damages in case of each parcel. The present force of the Commission is not qualified without further instruction, to do that work in a satisfactory way. Estimates have been made of the additional cost, but they are not reliable. It can only be said that the expense of our land work would be very largely increased.

It should be noted among other things that these values are to be reported as of the present time. The location and extent of the parcels must be considered, therefore, not as they existed when the railroad was built, but as they exist to-day. In case of older roads there have been very important changes in the size and frequently in the use of these parcels, so that the first requisite would be a resurvey of the road and an accurate determination of the parcels to be condemned. This of itself would involve a large outlay on the part of either the railroad or the government.

The real infirmity, however, of any report of this character lies in the fact that it would not express the fact but would of necessity be utterly misleading. The real question is as to the cost to a particular railroad of procuring its right of way at the present time if it were obliterated and were obliged to reacquire its operative lands. The answer to this question depends upon considerations and elements which the Commission can by no possibility determine with accuracy, and for this reason the question itself can not be answered.

When the railroads of this country were constructed, considerable portions of their right of way were donated. If a railroad were to be built to-day, a considerable portion of that right of way would be again donated. The amount of such donations would depend entirely upon the location of the railroad and the general attitude of the section through which it was to be located toward the project. The communities to be served might so desire the construction of the road as to be willing, by way of inducement, to donate the entire right of way. Upon the other hand, it has been found, in cases of new construction, that in some instances the building of the road has been opposed by landowners who have insisted upon the last penny. To determine, therefore, what amounts would be donated and what must be acquired by purchase or condemnation is utterly impossible.

But, assuming that all lands must be purchased or condemned, an entirely unwarranted assumption, very much still depends upon the attitude of the community, upon the character of the real estate agent who negotiates for the property, and upon many other things which can not be known or estimated. It is altogether impossible to say, even after the most careful consideration, what it would cost to reacquire this right of way. Of course a figure could be named, but that figure, for all practical purposes of valuation, would be meaningless.

It can not be denied that frequently the cost to a railroad of acquiring its right of way with respect to parcels which must be purchased materially exceeds the acreage value of the land taken. Previously to the decision of the Supreme Court in the *Minnesota Rate Cases* it seems to have been understood by many commissions and valuers that the proper method of determining the present value of the operative lands of a carrier was to inquire what it would cost to acquire those lands upon the basis of present prices. For the purpose of determining the excess of such cost over acreage value many studies were made of pieces of construction where the known cost could be compared with the acreage value, and from these investigations were deduced percentages which varied for rural right of way from 150 to 300 per cent, being less in case of city lands.

It would be possible for the Commission to investigate along these same lines and to report something in the nature of an average percentage, but such a figure would be of little or no significance as applied to individual railroads, and would be tantamount only to a general statement that there is such additional element of cost which usually falls within certain limits. The Commission has not felt that this would satisfy the requirement of the statute, and has be-

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lieved, as already stated, that it was practically impossible to report the fact called for.

Since the enactment of the valuation act the Supreme Court of the United States has decided the *Minnesota Rate Cases*, and that decision apparently would render immaterial the finding asked for even if it could be made.

Two views were earnestly contended for before the court in those cases. It was urged by the state that the proper measure of the value of the right of way of a railroad was original cost. It was insisted that these lands had been taken by leave of the government under the power of eminent domain, and that if the carrier was allowed all it had originally paid but nothing for the unearned increment, that was strictly just. This view was rejected by the court, which held that the carrier was entitled to the value of these operative lands at the time.

The carriers contended that the proper measure of the value of their carrier lands was what it would cost to acquire those lands at the present time under present prices. This contention was also explicitly rejected by the court, which declared that while cost of reproduction as applied in a reasonable way to certain parts of the plant of a railroad might be helpful in determining its value, it was utterly out of place as applied to lands.

An examination of the opinion of the court indicates that a real objection to the use of the reproduction method in determining the value of lands lay in the fact that by that method the carrier was given the benefit not only of the increase in the value of these lands but in addition a multiple of that increase. A simple statement illustrates this fact. Assume that Road A was constructed 10 years ago and that the cost of acquiring its right of way was twice the acreage value. Let it be further assumed that the acreage value of its lands at the time of dedication to public use was \$25 per acre, and that to-day this has increased to \$50 per acre. Plainly, the original cost to this carrier was \$50 per acre and the cost of acquisition to-day would be \$100 per acre. The landowner adjacent to the right of way benefits by \$25 per acre, while the carrier benefits by \$50 per acre.

It can not be questioned that the rule of the court would deny up to a certain point to the carrier any benefit from increase in the value of its lands. That would be so in the illustration above cited. Not until the increase in acreage value had come to equal the original cost to the carrier would the carrier get the advantage of the unearned increment. To give the carrier the exact benefit of any increase in the value of its lands it would be necessary to know the difference between the original cost and the acreage value at time

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of acquisition and to add that sum to the present acreage value; but this fact in the majority of cases can not be ascertained.

It should be still further noted that in some cases the increase in acreage value has not been sufficient, so that the present value equals the original cost, and it is urged that in such case under the rule of the Commission the carrier would be required to accept as the value of its lands a sum less than it had actually expended in acquiring them.

The Commission reports in all cases the present acreage value of the lands; those lands which have been donated; the original cost of those lands which were purchased. In cases where the original cost is greater than the present value the Commission will inquire whether there has been a decline in the value of lands and whether there is anything to indicate an unnecessary or unwarranted expenditure of money in the acquisition of the right of way. It is believed that these facts are all that can be required to determine the fair value of the operative lands of the carrier at the date of valuation.

STREETS AND HIGHWAYS.

Several questions are presented in case of the occupation of streets and highways by carriers for carrier purposes.

1. It frequently happens that a railroad is in exclusive possession of what was at one time a street or alley. This usually results from some arrangement between the municipality and the carrier under which the municipality passes an ordinance vacating the street or alley; that is, discontinuing the public use of the same and giving to the carrier the sole and exclusive use. The carrier upon its part usually does something in consideration for this grant, like the opening of a new street, the building of a viaduct, etc.

Ordinarily the municipality has no title to the land over which a street or alley is located. Upon the abandonment of the use of the street or alley the land reverts to the original owner. In such case the municipality has no title which it could convey to the railroad, since its only right is one of use which terminates when the use ceases. Still, cases are found upon almost every railroad where the carrier can exhibit no other title to this land than the ordinance of the municipality. In some instances it has acquired title to the adjoining lands and has therefore become the owner to which the land occupied as a street reverts, but this is by no means an invariable condition. The Commission has felt that in all cases where the carrier is in the actual and exclusive possession of property formerly occupied as a street, and is using the same as a part of its operative property, it should be credited with the same as though owned by it, unless it affirmatively appears that the carrier is not the owner.

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2. Most questions as to streets and highways arise where there is a joint occupation by the public and the carrier. The longitudinal occupation of the street, while not perhaps in essence different from the crossing proper, presents a somewhat different question and may be first considered.

A municipality by ordinance often permits a railroad company to lay and maintain its tracks along a public street. These tracks are sometimes carried over the street, but are usually placed upon it at grade. The public uses the entire street, including that portion occupied by the tracks of the railroad. Under these circumstances the carrier insists that that portion of the street which is actually occupied by its tracks—that is, the portion between the rails and for a distance on either side of each rail—is land owned or used by it; that the area of this land should be computed and its value determined. The Commission has not accepted this view. It has assumed that if the road were to be reproduced to-day the same arrangement would be made with the municipality which was in fact made. If under that arrangement the carrier pays anything for the privilege, it is allowed that amount; if it pays nothing, nothing is allowed.

The carrier contends that it uses certain defined land, but in fact the grant carries with it no land or the right to use any specific land. The municipality has no land in which it could grant any such interest. The privilege is strictly analogous to the franchise right of telephone, electric light, and gas companies to maintain poles, wires, gas mains, etc., along the public street.

Whether such franchise rights are an element of value upon which the carrier is entitled to earn a return has been the subject of much controversy before the courts. The present trend of authority seems to be decidedly in favor of the proposition that such a privilege can not be made the basis for earnings beyond the amount which has been paid for the same. If the government takes away the privilege it must compensate the carrier for its damages resulting from the loss, but so long as the privilege is continued it can not be made an element of value upon which the carrier is entitled to a return. When the public grants to the carrier the right to maintain its tracks along a public street it in essence assists the carrier to that extent in the discharge of its public duty. Certainly the public ought not to be taxed by reason of and in proportion to the assistance extended.

It may be further noted that if the privilege were to be taken away from the carrier by the government the value of the land occupied by the tracks of the carrier would in no sense be the measure of its damages.

In some states, and perhaps in most states, the laying of a railroad track under municipal authority imposes additional servitude upon

the property occupied by the highway for which damages may be demanded by abutting landowners. To the extent that such damages have been in fact paid they are added to the amount paid the municipality.

3. The crossing of streets and highways by railroads differs from the longitudinal occupation in that the carrier sometimes owns the fee of the land occupied in common. This is not generally so in case of city crossings. The lot is usually bounded by the street. The number of square feet in the lot embraces no part of the street. If the railroad buys such lot in securing its right of way it does not thereby acquire any interest in the street upon which it abuts. The right to cross must be granted by municipal ordinance and this ordinance does not purport to convey land or an interest in land.

It might happen that the carrier owned the land before it was plotted, in which event the title would still rest in the carrier provided it had a title in fee, which it sometimes has and sometimes has not. But the laying out of a street through a parcel of land usually enhances the value of the remaining land by more than the acreage of the street; that is, the lots will sell for more after the street is established than the whole parcel would have sold for before. Since the present value of railroad lands is determined by the value of adjacent and adjoining lands, it follows that the enhanced value of these abutting lots when applied to the lands of the railroad which are not included in the street is more than the value of the entire land before the street was laid out.

The question presented by the country highway crossing is not equally clear. In many states the title of the land only goes to the center of the highway. If the railroad buys a right of way through a parcel and takes title in fee, it owns that part of the land underlying the highway which is used by it and the public in common. It may also happen that the highway has been laid out over the railroad in which event the railroad would own either the use or the fee in the parcel of land used in common.

Ordinarily a railroad can not take under the right of eminent domain a fee to the land; it secures merely the right of use, and when the use terminates the land reverts to the original owner. In some states a railroad corporation can not take by deed a right more extensive than it could acquire by eminent domain, but in most states it may acquire by deed title in fee. The right of way of the carrier sometimes consists partly of lands held in fee but usually of lands in which the carrier has merely the right of use. In our work no distinction is attempted between title in fee and right of use, all operative lands being treated as though owned in fee.

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If a railroad purchases the right of way across a parcel of land, it does not necessarily thereby obtain the right to cross a public highway which has been laid out through that land even though it may in theory take title to the land which underlies the highway. It can only obtain the right to use the public highway by some sort of statutory authority.

It is also true that the laying out of the highway adds to the value of adjacent and adjoining lands, although not perhaps in the same direct and invariable manner as does the laying out of a street. To the extent that adjacent lands were benefited, the carrier has that benefit in the valuation of its lands.

As a practical matter it is impossible to consider every street crossing and country-highway crossing by itself. Some general rule must be adopted. If the carrier is treated as the owner in fee of all of its operative lands, and if it is credited with the full value of exclusively occupied land included in vacated streets except when it affirmatively appears that it is not the owner, is credited with land jointly used with the public in highways outside of municipalities unless the carrier's lack of ownership affirmatively appears, and if no part of streets in municipalities used jointly with the public is included unless the carrier's ownership is made to appear affirmatively, practical justice will be done. Such is the rule which the Commission has approved.

RIGHTS IN LANDS.

Carriers frequently enjoy for operative purposes rights in land of which they have neither the ownership nor the exclusive use. Examples are the right to take water from a spring, to maintain pipes through which the water is conducted to the right of way of the carrier, the right to maintain a tunnel underneath lands the surface of which is used by the owner. These rights divide themselves into two general classes, those in the public domain and those in private lands.

1. *Rights in the public domain.*—By public domain is meant not lands which are owned by the public, but rather those lands which can not be reduced to private ownership. Of this the best and most frequent illustration is afforded by navigable waters and riparian rights in the same. Such waters belong to the public and can not be granted to private individuals, although the privilege of using the same may be accorded to private parties. Riparian rights sometimes can and sometimes can not be reduced to private ownership.

Rights of this kind are treated like the right to use streets jointly with the public; that is, the report shows what has been paid for the privilege and nothing more. The reasons which have led

to the adoption of this rule are substantially the same as those already stated with respect to the joint occupation of a public highway. The privilege of use accorded by the superior authority is analagous to a franchise and should be treated in the same manner.

2. *Rights in private lands.*—By private lands are meant all those lands, including waters, which can be reduced to private ownership. Lands owned by a state or a municipality which could be sold and conveyed would be regarded as private lands. Such rights are appraised at their present value irrespective of the cost to the carrier.

THE ACCOUNTING SECTION.

The Commission's accountants deal with the records of the carrier, and the report of that section embraces everything called for by the act which is derived from an examination of the books of account and other records and documents. Among the subjects handled one of the most important is original cost to date.

ORIGINAL COST TO DATE.

The paragraph of the valuation act entitled "First" provides that the Commission "shall ascertain and report in detail as to each piece of property owned or used by such common carrier for its purposes as a common carrier, the original cost to date, * * *."

As the act is interpreted by the Commission original cost is a fact, to be determined from the best evidence available in each case. The cost of reproduction new is of necessity an estimate, for the property never will be reproduced in fact and the exact expense of reproducing it can not, therefore, be known. Depreciation is necessarily an estimate, for there is no way in which the exact amount of deterioration can be known. But these properties have been actually produced in the past and their production has cost a given amount of money. Original cost can, where the records suffice therefor, be exactly known, and it is in that sense that these words are understood by the Commission.

Investigation shows that original cost is frequently, indeed almost invariably, more or less than a fair average cost. Many causes contribute to this result. Poor judgment may have been used in the planning and the executing of the project; accidents may have intervened; an unusually wet season may very much increase the cost of certain construction work; there may have been extravagance or even dishonesty; and all this would increase the expense above normal. Upon the other hand, all conditions may have been extremely favorable, and in consequence the work may have cost less than a fair

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average. The Commission in its report does not inquire what the work ought to have cost.

This fact is ordinarily ascertained from an examination of the books and records of the carriers, but other sources of information may be resorted to provided they indicate the fact. For example, the available records of contractors that built the property are examined; records of reorganization committees and syndicates are studied; reports of state and federal bodies and the records of court proceedings are reviewed. In some instances valuable information has been ascertained from authentic publications dealing with the early history of the property. This course is pursued only in cases where the records of the carrier are missing or deficient with respect to the expenditures for property. The search is for the best evidence of cost. If the fact can not be determined within reasonable limits of accuracy, from evidence which carries with it a fair degree of certitude, the Commission so reports.

It sometimes happens, usually in case of equipment or of lands, that the major part of the cost is known, but that some betterment in case of equipment or some additional expense in case of land can not be located. In the case of equipment it is possible to ascertain the cost as a rule. In some cases the cost of betterments can not be ascertained. In the case of lands more difficulties are encountered. The records of land costs are frequently incomplete and it is necessary to resort to the deeds of conveyance to ascertain the record of such costs. In cases of this kind the Commission reports the cost as far as it can be ascertained, indicating as far as practicable what the original cost as reported covers and what is lacking.

The valuation act requires that original cost shall be reported in detail as to each piece of property. This requirement applies also to cost of reproduction new, and in our discussion of the work of the engineering section the meaning given to this phrase was stated. The detail employed in showing cost of reproduction new is usually the commercial unit. The number of yards of grading, the number of pounds of steel in a bridge are given for each valuation section. It has not been found possible to observe the same detail in showing original cost for the reason that the accounts of the carriers have been so kept that while they may show the total cost, they do not distribute it by units of this kind. It also frequently happens that the original cost itself per unit is not at all uniform. For example, the grading upon a particular valuation section may have been done under different contracts, each one of which would name a different price. Ordinarily the Commission states one price for one kind of grading upon an entire valuation section.

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After considerable investigation the primary account has been selected as the unit by which original cost should be shown, and it is believed that ordinarily this is sufficient for every practical purpose. When, therefore, original cost to that degree of detail can be ascertained from the books and records of the carrier or from any other source, it is stated by primary accounts. When this can be done the information is given by valuation sections and our valuation sections are established with a view to showing original cost when that is possible. If it cannot be shown by valuation sections but can be shown in some more comprehensive manner, as, for example, in the summary of the whole, that is done. In some cases the original cost which is shown by primary accounts is further distributed to the structural unit. When that can be done those facts are so reported.

It sometimes happens that original cost can be shown in this detail for some valuation sections but not for the entire line, and whenever this is possible it is done. Of this the San Pedro, Los Angeles & Salt Lake Railroad furnishes a good illustration. The two terminals of this road, one at Salt Lake City and the other at Los Angeles, were made up of old properties with respect to which original cost could not be shown, but the line connecting the two was of comparatively recent construction, the records of which were in fairly good condition. Here the valuation sections were distributed with particular reference to original cost and the Commission was able to show the primary accounts for all this portion of the road.

When it is not possible to state the original cost by valuation sections, and the Commission can only state it divided between land, equipment, and other costs, it is so reported.

The report of the accountants contains many details of original cost, especially as applied to individual structures, while buildings and bridges of considerable importance which are not referred to in the tentative report nor in the tentative valuation are often shown in detail. Whoever, therefore, is particularly interested in this subject must look into the report of the accounting section just as he who would know the detail of cost of reproduction and of depreciation must consult the report of the engineers.

It should be noted that the original cost to date reported by the Commission is not always the actual cost of the unit now in existence. The accounting rules of the Commission with respect to certain primary accounts in case of replacement take no account of differences in cost between the thing when replaced and the thing which is replaced. Consider the tie as an illustration. Let it be assumed that the tie now in place is exactly similar in every respect to the tie which was originally installed 25 years ago. That tie cost 50 cents; the present tie cost \$1; nevertheless, the original cost of the present

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tie as carried upon the books of the carrier and in its investment account is 50 cents, which is reported as the original cost. The cost of placing the tie is carried in Account 12, tracklaying and surfacing, which is entirely a labor account. Evidently if the cost of labor has increased the expense of placing the present tie exceeds the expense of placing the original tie, but this difference in expense is not reflected in Account 12, and it does not therefore appear in our report of original cost. Other of the primary accounts are affected in the same way to a greater or less extent. If the purpose is to show what the existing article has cost the stockholders of the company, then the method observed is correct, since the difference between the price originally paid and the present price has been charged to operating expenses.

The act, as already noted, calls for original cost of each piece of property in detail. In response to this requirement, the unit of property is first identified and the attempt is made to locate the cost of that unit. It was finally determined, as already stated, to disregard the individual units and report by primary accounts, thus treating all property of that class as one unit. Under this procedure the accountant begins with the property and allocates the cost when possible. Owing to the manner in which the accounts of railroads were kept down to about 1907, it is difficult to make this distribution of expenditures even by primary accounts.

What can be done and is done in case of lands appears in the discussion of the work of the land section.

For equipment, original cost per unit—that is, per car or per engine—can usually be shown where the age of the unit is not too great. Each article of equipment can usually be dissociated from everything else and treated by itself, and therefore where the additions and changes have not been extensive the original cost as a rule can be shown with exactness.

With respect to the road accounts there have been continual changes involving additions and retirements, but maintaining in many cases the same general structure, which renders the showing of original cost extremely difficult.

It is possible to approach this problem from a different angle. Instead of inquiring what particular pieces of property cost, the Commission may state what has been the total investment in the property now in being. The Commission's accountants have usually approached the problem from this angle in case of older properties, with more satisfactory results. In showing this kind of original cost the accountant endeavors to determine the source from which the money is derived. It may have been paid in for the issue of securities or upon some other consideration; it may have come from the earn-

ings of the property by appropriating income which might otherwise have been divided as dividends; additions and betterments have often been paid for out of revenues. Whenever the records of the carrier clearly show that a given amount has actually gone into the purchase of property and the source from which this was derived, our report indicates both the amount and the source.

Generally it is possible to know with reasonable accuracy the total amount which has been invested in the development of the enterprise. This, however, may have been expended for property which is not now in existence and does not, therefore, represent the original cost of the property in being. To obtain this result proper deduction must be made on account of retirements. Whenever the fact of the retirement can be located from the records of the carrier and the cost can be determined it is deducted, but in many cases this can not be done. It will be seen, therefore, that this figure will represent before retirements have been written out the total investment in the enterprise; that is, the amount of money which has gone in and no part of which has been taken out as money. When the proper retirements have been made the result is the original cost of the property in existence, assuming those retirements to have been all identified and the original cost properly determined. It is believed that this figure is of great value, but it must not be understood that it precisely represents original cost, for it does not.

AIDS, GIFTS, GRANTS, AND DONATIONS.

Large contributions have been made both by public authority and from private sources in aid of the construction of our railroads. The act requires an investigation and report upon this subject, which is mainly handled by the accounting section.

Each carrier is required to file a return of its lands showing among other things, with respect to each parcel, the consideration paid. This return is verified by the accountant who examines the books and records of the carrier, not only for the purpose of ascertaining whether the facts stated in the return are supported, but also what other facts may be disclosed. With respect to most carriers donations of land are in this way known with substantial accuracy, although in case of the older roads, especially in the south, where the records were destroyed during the Civil War, it is frequently impossible to obtain the information.

Carriers are also required to file a return showing all aids other than land. The books and records of the carrier are examined by the accountant in the light of this return and whatever they disclose is developed and reported.

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State commissions have been requested to cooperate in this behalf and several of them have rendered valuable assistance. By these various means many, perhaps most, of the donations by public authority and private individuals are ascertained and reported, but considerable still remains. To discover this would involve investigation of outside sources of information attended by much expense if made at all exhaustive and it has been felt that this would not be justified.

Land grants are treated as a separate proposition, the report covering the total grant, the amount received from lands already sold, and the value of those remaining unsold. This last value is necessarily an estimate.

CORPORATE HISTORY.

In the development of the railroad systems of this country there have been numerous consolidations, reorganizations, leases, etc. The Boston & Maine system, for example, which comprises less than 2,500 miles, involves 167 corporations. The act requires an investigation and report as to this corporate history.

This subject is dealt with by the accounting section. The date of organization of each corporation, what property was constructed by it, what became of that property, and of the corporation itself is recited. The report of the accountant gives a complete picture of the corporate growth of the system from the beginning down to the date of valuation.

In the same connection a full statement is made of all issues of stocks and bonds by each corporation, together with an account of the consideration either in money or in property which was paid for the same. The means resorted to by the carrier for the providing of its funds, the amounts paid in the way of discounts, and, indeed, everything connected with the financial history is fully shown.

It will be seen that the accountant develops whatever facts are contained in the records of the carrier and it is believed that the facts thus developed are of great significance in exhibiting what may be termed the financial equities of each case.

REASONS FOR THE DIFFERENCES BETWEEN VALUES.

By the act the Commission is required to report not only an analysis of the methods by which the several cost values are obtained but also the reasons for their differences, if any. From what has been stated in this analysis of methods, it must be clear that the reasons for the differences in amount between the various cost values

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reported, i. e., the original cost to date, the cost of reproduction new, and the cost of reproduction less depreciation, are to be found in the essential differences in the nature of the inquiries which must be made in order to ascertain each of those cost values, respectively, based as they are and must be on varying assumptions, attended by varying conditions in which the actual and the hypothetical are contrasted, and affected by fluctuations and trends in the prices of labor and materials.

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NOTE TO APPENDIX 3.

ENGINEERING BOARD MEMORANDUM NO. 226 (AS REVISED NOVEMBER
6, 1915).

SUBJECT: *Depreciation of road and equipment property.*

The board is of the opinion that the principles contained in the following definitions should govern in determining the depreciation of physical property used for common-carrier purposes:

- (1) Depreciation is the lessening in worth of physical property due to use or other causes.
- (2) Labor depreciates with the items of property of which it is a part.
- (3) Service-condition per cent is the ratio between remaining capacity for service and total capacity for service in each cycle of use.
- (4) Depreciation shall be determined by a consideration of observations of actual conditions of the property and mortality statistics of similar property in like use applied where practicable on the straight-line basis.
- (5) Salvage is the net value which an article possesses for carrier purposes other than that for which the article was originally used.
- (6) Scrap is the net market value which an article possesses after its service for carrier purposes has been exhausted.
- (7) Normal life shall be the estimated average total service life under ordinary conditions.

When depreciating property under the several accounts, the following general rules shall apply:

- (a) Ordinarily, service-condition per cent shall be the ratio between the remaining service life and the total service life. When the depreciation of an item of property is based upon the weighted average of the parts, the service condition of each part shall be determined by this ratio.
- (b) When a normal life for a particular item of property has been prescribed for use in determining depreciation, that life must not be departed from unless an investigation of the records of the carrier or actual inspection in the field, or the two combined, warrant such departure. In no case shall a remaining service life of an item of property be taken at more than the prescribed normal life.
- (c) When no normal life is prescribed, the total service life and remaining service life shall be determined from observation of actual conditions and the examination of records and data from reliable sources.
- (d) Salvage and scrap will be allowed in cases where such values actually exist. Whether allowance shall be made in a given case for salvage or scrap shall be left to the discretion of the member of the engineering board. If an allowance is made, this fact shall in all cases be stated upon the pricing sheet, even though at the time the amount of the allowance can not be given.
- (e) The service-condition per cent as stated in the field record by the field man shall be subject to revision and final fixing by the member of the engineering board or his staff subordinates. The service-condition per cent fixed in the field is assumed to be simply the statement of a fact.

ACCOUNT 1, ENGINEERING.

A small portion of the expenditure for engineering is connected with property which depreciates. In view of the fact that the larger portion is expended on location surveys, grading, and other property which does not depreciate, and

that the accounting records have been so kept in the past as to make it impracticable to segregate that portion of the expenditure which depreciates, the service-condition per cent of the account shall be considered at 100.

ACCOUNT 3. GRADING.

No allowance shall be made for appreciation or depreciation, as such, to excavation and embankment pay quantities of grading. Other property such as breakwaters, bulkheading, retaining walls, and similar items constructed of perishable materials shall be depreciated.

ACCOUNT 5. TUNNELS AND SUBWAYS.

The excavation of tunnels and subways, including backfilling, shall not be depreciated. Concrete and other masonry shall be given a normal life of 100 years.

ACCOUNT 6. BRIDGES, TRESTLES, AND CULVERTS.

(a) Metal bridges shall be given a normal service life of 70 years, provided that the loads for which they were designed are not now being exceeded.

(b) Masonry culverts shall be given a normal service life of 100 years.

(c) Cast-iron culvert pipe shall be given a normal service life of 80 years, and other iron or steel pipe a normal service life of 30 years.

(d) Vitrified and concrete culvert pipe shall be given a normal service life of 50 years.

(e) Masonry piers and abutments shall be given a normal service life of 100 years.

ACCOUNT 7. ELEVATED STRUCTURES.

Depreciate on the same basis as Account 6.

ACCOUNT 8. TIES.

Where the track has reached such a condition that the tie renewals are uniform in quantity and quality from year to year the service condition shall be considered as 50 per cent. The average life of ties shall be determined by a study of the carrier records of tie renewals supplemented by a consideration of field observations.

ACCOUNT 9. RAILS.

Rails shall be considered as having two cycles of life, viz, new to relay and relay to scrap. Each cycle shall be considered separately and have a range of service-condition per cent of 100. The first cycle for a particular carrier shall be determined by a study of its rail renewals and the rail renewals of other carriers in the vicinity having similar traffic conditions. This cycle may vary upon different divisions of the same carrier where traffic conditions are different. A net salvage value shall be allowed for rails at the end of the first cycle equal to the price of relay rail at carrier's nearest material yard, less cost of bringing same from point where renewed.

The second cycle shall be considered as having a normal life of 50 years.

When in depreciating relay rail the date relaid can not be ascertained from records the same shall be estimated from the best available data. Where rail was laid new in sidetracks and will be used in this service until it becomes scrap it shall be given a normal life of 75 years. Where the annual rail renewals in yards have become uniform in quantity and quality a service condition of 50 per cent may be used.

A net price shall be assigned to scrap rail based upon the price of scrap at the carrier's nearest material yard, less cost of bringing same from point where renewed. The weight of relay and scrap rail shall be assumed to be the same as that of new rail.

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ACCOUNT 10. OTHER TRACK MATERIAL.

(a) Splice bars shall be depreciated in cycles on the same basis as the rail with which they are used.

(b) Bolts shall be depreciated from new to scrap during each cycle of the rail with which they are used.

(c) Spikes shall be depreciated on the same basis as the ties with which they are used.

(d) Where average annual renewals of frogs and switches are uniform and conditions warrant, they may be depreciated on a 50 per cent basis.

(e) All other track material for this account shall be depreciated from new to scrap during each cycle of the rail.

ACCOUNT 11. BALLAST.

Ballast shall be depreciated according to the general rules.

ACCOUNT 12. TRACK LAYING AND SURFACING.

Track laying and surfacing shall be depreciated with the materials composing the track included under Accounts 8, 9, 10, and 11. The depreciation shall be determined on the basis of the depreciation weighted according to the labor costs assignable to the materials of the several accounts.

ACCOUNT 13. RIGHT-OF-WAY FENCES.

Right-of-way fences shall be depreciated under the general rules.

ACCOUNT 14. SNOW AND SAND FENCES AND SNOWSHEDS.

Property under this account shall be depreciated according to the general rules.

ACCOUNT 15. CROSSINGS AND SIGNS.

Property under this account shall be depreciated according to the general rules. The normal life of materials stated under Account 6 shall be applied to culverts and bridges.

ACCOUNT 16. STATION AND OFFICE BUILDINGS.

Timber structures shall be given a normal service life of 50 years and masonry structures 100 years, suitably modified where observation shows principal parts are new or in need of renewal.

ACCOUNT 17. ROADWAY BUILDINGS.

Roadway buildings shall be depreciated as in Account 16.

ACCOUNT 18. WATER STATIONS.**ACCOUNT 19. FUEL STATIONS.****ACCOUNT 20. SHOPS AND ENGINEHOUSES.****ACCOUNT 21. GRAIN ELEVATORS.****ACCOUNT 22. STORAGE WAREHOUSES.****ACCOUNT 23. WHARVES AND DOCKS.****ACCOUNT 24. COAL AND ORE WHARVES.****ACCOUNT 25. GAS PRODUCING PLANTS.**

Property under these accounts shall be depreciated in accordance with the general rules.

ACCOUNT 26. TELEGRAPH AND TELEPHONE LINES.

Iron wire shall be given a normal service life of 50 years and copper a normal service life of 100 years. Other property shall be depreciated according to the general rules.

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ACCOUNT 27. SIGNALS AND INTERLOCKERS.**ACCOUNT 28. POWER DAMS, CANALS, AND PIPE LINES.****ACCOUNT 29. POWER-PLANT BUILDINGS.****ACCOUNT 30. POWER SUBSTATION BUILDINGS.****ACCOUNT 31. POWER-TRANSMISSION SYSTEMS.****ACCOUNT 32. POWER-DISTRIBUTION SYSTEMS.****ACCOUNT 33. POWER LINE POLES AND FIXTURES.****ACCOUNT 34. UNDERGROUND CONDUITS.****ACCOUNT 35. MISCELLANEOUS STRUCTURES.****ACCOUNT 36. PAVING.****ACCOUNT 37. ROADWAY MACHINES.****ACCOUNT 38. ROADWAY SMALL TOOLS.****ACCOUNT 44. SHOP MACHINERY.****ACCOUNT 45. POWER-PLANT MACHINERY.****ACCOUNT 46. POWER SUBSTATION APPARATUS.**

Property coming under these accounts shall be depreciated under the general rules.

ACCOUNT 51. STEAM LOCOMOTIVES.

Steam locomotives shall be depreciated according to the general rules.

The percentage finally established as representing the present service condition of each locomotive shall be the weighted average of the assigned condition per cent of the following principal parts:

Engine: (a) Boiler; (b) underframe; (c) running gear.

Tender: (a) Trucks; (b) underframe; (c) tank.

ACCOUNT 52. OTHER LOCOMOTIVES.

Use the same rules as set forth under Account 51.

ACCOUNT 53. FREIGHT-TRAIN CARS.

Freight-train cars shall be depreciated according to the general rules.

A service condition shall be established for each series of cars, which shall be the weighted average of those cars of the series actually inspected. Not less than 10 per cent of the cars of each series shall be inspected for condition, and a larger percentage where a series contains a small number of cars, or if the cars in a series vary greatly in condition.

The service-condition per cent established for each car inspected shall be the weighted average of the service-condition per cent assigned to the following principal parts of the car: (a) Body, (b) underframe, and (c) trucks.

ACCOUNT 54. PASSENGER-TRAIN CARS.

Passenger-train cars shall be depreciated according to the general rules.

Each passenger-train car shall be separately inspected to determine service condition, following the same general rules as set forth under Account 53.

ACCOUNT 55. MOTOR EQUIPMENT OF CARS.**ACCOUNT 56. FLOATING EQUIPMENT.****ACCOUNT 57. WORK EQUIPMENT.****ACCOUNT 58. MISCELLANEOUS EQUIPMENT.**

Property coming under these accounts shall be depreciated in accordance with the general rules.

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