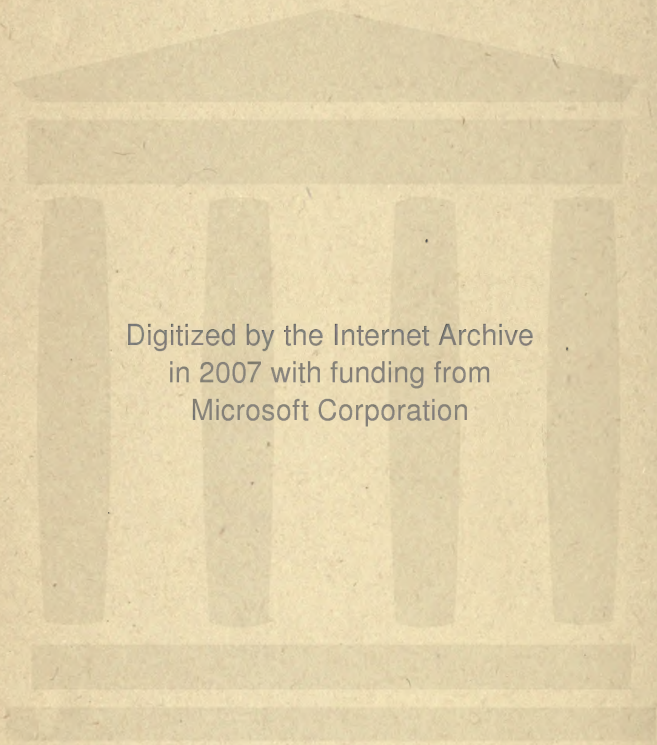

DEPRECIATION
OF
PUBLIC UTILITY PROPERTIES

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DEPRECIATION

OF

PUBLIC UTILITY PROPERTIES

AND

Its Relation to Fair Value and Changes in the Level of Prices

BY

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PREFACE

THE regulation of public utilities in the United States is a development of recent years and is still in the period of formation and establishment of rules of practice.

The great war, with its unsettling of business conditions, and the violent price fluctuations which accompanied and followed the actual war period have introduced new complications into some of the problems which were being dealt with by Regulating Commissions and Courts just at a time when it appeared that definite conclusions were being reached.

Valuation and Depreciation, and the accounting methods which deal with these subjects, have been greatly complicated by the price fluctuations of the period 1914 to 1921. New questions have been raised, new arguments have been introduced and it would appear that some conclusions are in danger of being reached which may have a far reaching effect upon utility properties through the weakening of the stability of valuations already established, and the ultimate wiping out of a large part of the actual investments necessarily made in extensions of property during the period of high prices.

The writer has come into contact with a number of these problems and has studied their recent complications, in different parts of the country, on dif-

ferent properties, under a number of different conditions. His first work on public utility valuation was as assistant to M. E. Cooley in the 1900 Michigan valuation. His subsequent connection with this class of work has not been confined to one side of the case or to one character of controversy, but as engineer for corporations in some cases, for cities and other public corporations representing the rate payers and general tax payers in others, for the public utility commissions of two states in other cases, and as arbitrator in several cases which have involved rate making, taxation, authorization of capital and sale of property, he has had a good opportunity of studying a number of different angles of these questions.

It would seem that an attempt to consider the subjects of Fair Value and Depreciation from an entirely unprejudiced viewpoint and without the issues of any particular case in mind is appropriate at this time. The following pages represent an effort to set forth the writer's views and conclusions as they have developed in connection with a practice of over twenty years, and to present the various arguments which have been considered by him in reaching those conclusions. This work has been done as part of a sincere attempt to find that middle ground of absolute fairness and justice which must be determined before the public utility issue may be considered as reasonably settled.

Many hundreds of men have been brought into contact with valuation work for the first time through their employment on some large appraisal. Many of these men have lacked a knowledge of the

legal decisions bearing on the relationships between owner of property and consumer or patron. It would therefore seem that there is justification for such a book.

The attempt is here made to trace briefly the history of regulation of utilities, to present, as the writer sees it, the true conception of "depreciation" as that word has been used in valuation and regulation practice, and to point out certain important conclusions of the courts with which every one engaged in valuation work ought to be familiar.

The Appendix presents the various decisions at considerable length, in so far as they deal with the subject of depreciation. The decisions are arranged in chronological order, since in that way they clearly show the drift of legal opinion as the subject of valuation has developed.

HENRY EARLE RIGGS.

ANN ARBOR, MICHIGAN.
July, 1922.

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DEPRECIATION OF PUBLIC UTILITY PROPERTIES

CHAPTER I

THE PROBLEMS OF REGULATION

The regulation of public utilities by the National and State governments in the United States is a development of the last half century, although the principles of law under which it is justified have been recognized for five hundred years or more.

A very brief outline of the history of American utility regulation and the causes which led up to it is essential to a complete understanding of the argument which is presented in the following chapters.

The steam railroads, the largest group of privately owned utilities which are engaged in serving the people, may fairly be said to have been in very large measure responsible for the development of public utility regulation in the United States. Practically every evil that has ever been complained of, such as over-capitalization, excessive rates, discrimination, corporation wrecking, manipulation of

securities, combinations, rebating, speculation and bad accounting practice has been laid at the door of the railroads. The early legislation which resulted in the creation of the various state commissions and the Interstate Commerce Commission was the direct result of many arbitrary and injurious acts of the railroads which aroused a storm of opposition and caused the people of a large section of the country to seek relief. A review of railroad history is in fact a review of the growth of our laws on the subject of regulation and of the creation of the machinery for putting regulation into effect.

The first railroad in the world was opened to traffic September 15, 1830, less than one hundred years ago.[1]

The period from 1830 to 1850 marked the establishment of the railroad as the principal transportation agency of the country, demonstrated its superiority over the canal, established its credit as having a capacity for earning good returns, and gave it standing as sound security for loans in the form of bond issues.

The second period from about 1850 to about 1870 may properly be called the era of expansion and development, and marked (except for the four years of war) a rapid growth in mileage, especially in the central states.

Following this, and merging into it came a period ending just prior to 1890 which may properly be

[1] Charles Francis Adams, *Origin and Problems of Railroads*, "The Genesis of the Railroad System."

called the era of speculation and discrimination. It was the period of greatest railroad growth and expansion. Thousands of miles of new lines were built each year. There was at the outset no governmental control over the railroads. Earlier acts of railroad oppression appear to have developed into a perfect riot of combination, discrimination, extortion and rebating. The people of the central west retaliated. The grange movement organized about 1870 spread like wildfire and in a short time exerted a tremendous influence in politics. The bursting of the bubble of inflated values and inflated credit by the panic of 1873 created conditions in many localities which approached actual warfare between the producers and railroads. Laws were passed in many states known as "granger legislation" reducing railroad rates and inflicting requirements on the railroad, many of which were just as bad as the acts of the railroads which gave rise to the laws.[2]

During the period from 1873 to 1890 many cases reached the Supreme Court and one after another the principles of law were stated which clarified the situation and established fully the right of the government to regulate the corporations.[3] Several

[2] For complete details regarding these matters, see: Hepburn Committee Report, N. Y. Legislature, 1879; Report of Select Committee of the U. S. on Interstate Commerce, 49th Congress, 1st Session; Railway Problems, Wm. Z. Ripley, 1907; The Heart of the Railroad Problem, Frank Parsons, 1906; Wealth Against Commonwealth, Lloyd; History of Standard Oil, Ida M. Tarbell.

[3] *Munn vs Illinois*, 94 U. S. 113 (1876) and accompanying cases, 94 U. S. 155; 94 U. S. 164; 94 U. S. 179; 94 U. S. 180; 94 U. S. 181. *Stone vs Farmers' Loan and Trust Company*, 116 U. S. 307, 1881. *Chi-*

more or less futile early railroad commissions were established between 1875 and 1885, and finally, in 1887 the Interstate Commerce Commission was created and the machinery for nation-wide control of the railroads was set in motion.

The fourth period of railroad history, commencing from 1887 to 1890, and extending to the present time, may be termed the period of regulation. The Interstate Commerce Commission has grown in power and influence and has done splendid work. The older state commissions have been reorganized, and many new ones, organized along new and broader lines, have extended their control to other public utilities than the railroads and have made great progress in the settlement of many of the questions which had been causing friction. The utilities have quite generally come to a realization of the many benefits which they themselves derive from regulation, and there has grown up a better understanding of the relationships between the utilities, their patrons and the regulating bodies.

Regulation of utilities is indeed a new thing. Its beginning dates back to the years between 1885 and 1890, but a little over thirty years. The uniform accounting law went into effect in 1907, only fifteen years ago, and the large development of corporation accounting regulation has been since that time.

The Knoxville waterworks decision which was handed down in 1909 marks the beginning of a defi-

cago, Milwaukee and St. Paul Railway Company vs Minnesota, 134 U. S. 418 (1890); *Reagan vs Farmers' Loan and Trust Company,* 154 U. S. 362 (1894).

nite era in regulation and accounting because it was the first authoritative recognition of the necessity for providing for depreciation or replacement.

The first large work of valuation undertaken in the United States was the Cooley railroad appraisal in Michigan in 1900, followed during the next six or seven years by similar work in a number of other states.

The work of public utility regulation is still decidedly in the formative period, many principles have yet to be established, many details of engineering and accounting practice have yet to be worked out. Some old methods need to be discarded and some theories which have been given weight need reappraisal in the light of the conditions now existing.

Among the subjects most prominently before commissions at the present day are those relating to valuation and depreciation.

What is the correct method for determining "fair value" for rate making and other purposes?

What methods shall be adopted for the determination of "depreciation," in the sense that the word is construed to mean a proper provision for the replacement of units of property when they are worn out, so that the integrity of the investment may be maintained?

How shall the accounting for replacement be done?

What methods shall be adopted for the determination of "depreciation," in the sense that the word

is used to mean loss of value which shall be deducted in fixing "fair value"?

What is the effect on all of these questions of the recent changes in the price level, or the fluctuation in the value of money?

How shall accounting rules be modified, if at all, to meet the conditions brought about by the change of price level?

It is to these questions that consideration is given in the following pages.

CHAPTER II

INVESTMENT IN PUBLIC UTILITY PROPERTIES

There are certain kinds of service which have become absolutely essential to our present-day civilization, which are of such a character that the individual cannot furnish them for himself. These services are necessarily rendered under conditions of substantial monopoly. They may be had in one of two ways. Either government may build and operate them, or private capital may be induced to build and operate them subject to government regulation.

It is definitely settled that where private capital does undertake to build one of these quasi public utilities and accepts a franchise, it places itself under obligation to build a property suitable and sufficient to render the service, to maintain the property always in a safe and adequate condition to render the service, and to operate the property at all times in such manner as to furnish the service. Upon the state there rests the obligation not to impair the grant.

The obligation resting upon the utility company is such that it must maintain its property at all times in a condition as fully adequate to render the

service it has undertaken to perform as when it was first installed. While the obligation endures, service must be given, and the property must be kept in condition to give it. The property cannot be sold or leased, except as coupled with the obligation. The obligation compels the owner to replace parts of the property as they decay so that the property *as one composite instrument of service* may never deteriorate far enough to impair efficiency or safety of service, and the obligation is devoted to the service of the public just as truly as the property is. The property is security for the performance of the obligation. The courts, through their receivers have in many instances made large expenditures on properties to put them in adequate condition to render the service, and such expenditures have been imposed as a paramount lien on the properties.

It would seem to be clear that the obligation to maintain the property is such that it offsets the progress toward replacement of parts of the property. Even granting that it were true that the obligation to replace is of no value to the public until the necessity arises for its performance, it is equally true that the theoretical deterioration or loss of service life is of no detriment to the public until necessity arises for its replacement, and it would be an economic wrong and undue hardship on the user (who must pay for it) to replace before there was a necessity to do so.

This *obligation* under the franchise has been recognized by the courts in a long line of decisions. It must be taken into account and as long as a property

is fully maintained and properly administered, and as long as the policy of the management provides for proper renewals when due, or provides otherwise a proper system of accounting for reserves with which to replace items of property when they reach the ends of their lives, the effect of the obligation cannot be ignored.

It is pertinent to inquire what the owners of a public utility secure when they furnish the money with which to build a railroad, waterworks, gas plant, electric plant or other property destined to furnish service of a sort which compels it to submit to regulation.

Any public utility which has been built long enough to form its connections, secure its business, and reach a condition of maximum efficiency, and which is *fully maintained to the highest standard required by its service,* will be found to be made up of many different kinds of units of property. Some of these units, or the items composing them, will be found to be new, some will be old and ready to be replaced and some will be found to be in all stages intermediate. This is the normal condition of all properties which are fully maintained. This is the maximum condition that could be hoped for when the owners started out to make the investment. This property cost the entire amount of money which was spent for plant. It is folly to assume that such a thing as a hypothetical "new property" is what was sought. No one ever started out to build just simply a "new property." No one can ever possess a utility property all of whose parts

are "*new,*" and if such a thing were possible it could not be kept so. It would be criminal economic waste to discard perfectly good property units merely because they are not "new." If newness were the ideal, and if all lack of newness were to be computed on the basis of a guess as to probable life and deducted from capital on which returns could be earned, how many properties would be financed? What inducement could be offered to capital to encourage it to seek this field of investment? The answer appears to be obvious. Capital would not flow to the public utility field.

The hypothetical "new property" was simply a device of the engineers engaged in early valuation practice to enable them to form rational estimates of condition or so-called "depreciation," a subject which will be discussed later.

The various courts and commissions in dealing with the subject of valuation have had to work out many complex cases in which all sorts of arguments have been presented.

Erroneous construction of certain court and commission decisions by attorneys and engineers; claims for the deduction of value on account of purely theoretical accrued loss of service life; the setting up of different valuations of the same property at the same time for different purposes, such as rate making, capitalization, taxation or sale; are among the confusing issues that have been injected into these cases.

"Fair value," as that term has been used by the courts, must be defined. As value must depend on

property and income, necessarily a public service property is worth no more than the sum of money upon which it is allowed to earn a reasonable return.

Those who hold that there is one value for purposes of ratemaking and another for purposes of sale, or the state officials who argue a low value for rates and a higher value for taxes, will find grave difficulty in convincing the owner of money of the propriety of investing his money in any property which *costs* more than it is allowed to *earn* upon. The corporation managers who in the past have devoted time, energy and money to trying to prove a low valuation for purposes of taxation, instead of recognizing the necessity for correct valuation and of adequate rates to enable them to pay their taxes, have done much to add to the confusion.

Much of the indefiniteness regarding the weight to attach to certain court or commission decisions, or regarding the proper interpretation of some of them, is undoubtedly due to the fact that conditions surrounding the different properties are so extremely variable.

One property, located in a community which is growing rapidly and which has a population which uses the product of the utility liberally, may not be at all comparable with a similar property located in a dead community where there is but small demand for the product.

Unless good judgment has been used in making the investment, and the plant was either built in response to a real need for the product, or the building of the plant developed other industry so that

the market for the product was created by the construction, it is not to be expected that the public can be required to guarantee returns. The public cannot be expected to underwrite the losing venture, or the unwise, imprudent or injudicious investment.

In the case of the property which was built in response to a reasonable need, it is definitely settled that the owner may expect rates which will cover all operating costs including enough to maintain the investment intact, and in addition a fair return upon "fair value." Certain clear principles of accounting for capital expenditures, and for replacement of property charged to capital, appeared, before the war, to have been settled by regulating commissions in such a way that no exception could be taken. Recent changes in the price level seem to have raised a question as to the propriety of some of these conclusions as to accounting.

All money expended in the construction of property, which is paid out for necessary costs inevitable in the building of such a plant, should be charged to capital.

All money expended in enlargement or extensions of the property should be charged to capital through the additions and betterment account.

All money expended in repairing and maintaining the property or in replacing or renewing any of the parts or units of the property, so that it is kept in the condition, as to size and capacity, in which it was before the renewal was made, should be charged to operating expenses.

The rate payers have a right to demand that no

additions to property of any kind or to any extent be made through charges to operating expenses. The rate payer must provide enough to maintain invested capital intact. He should be protected from any attempt to increase capital value at his expense, and without corresponding investment by the owner.

All property charged to capital should be built from money that comes from the investor, or from money that belongs to the investor, in the form of surplus.

All expenditures charged to operating expenses should come from the rate payers.

It must be remembered that principles of economics and accounting which are applicable to the great complex properties of indefinite or infinite life such as railroads, electric railroads, electric power, telephone and gas properties, composed of thousands or hundreds of thousands of items and operating units are not so simple as those which apply in the case of property consisting of a single unit. Conclusions cannot be drawn from the case of the man with one automobile, who has engaged in the jitney business, which are applicable to the great property engaged in street railway transportation in one of our large cities.

It seems clear that we must consider these properties as vast complex composite instruments of service. Each utility is *one property,* made up of hundreds of thousands of individual parts, such as separate machines, structures and buildings, which may be considered as units, but all of these units serve the one purpose for which the corporation was

formed. Each finds its greatest value as a part of the whole property and not as a separate unit. The property as a whole is not an article of commerce with a market price varying with the varying cost of its constituent elements.

The great property was built under franchise to render a continuing service. The property as one entity is therefore of continuing life and in many cases, like the railroads, of indefinite life. It must continue to exist so long as the service is needed.

The Michigan Central Railroad from Detroit to Chicago is seventy-five years old. Its track has never ceased to function. The ties and rails have been changed many times. Its bridges have been rebuilt time and again. The line has been changed in numerous places, old parts of the road bed abandoned and new ones built. The property has grown from the primitive construction with wooden stringers, strap rail and light equipment to the great modern railroad of today through constant additions, betterments and changes. Yet during all of those years *the owners have had one property,* a railroad. They have never for a moment seriously considered that their investment consisted of a countless number of units of property such as rails and ties, bridges and buildings, locomotives and cars. The public has never seriously so considered. That property has grown in value as its plant was increased and as its capacity to render service increased.

Investment of capital in any public utility secures *one property* for the purpose of furnishing trans-

portation, or making gas, or of furnishing electric power or for some other kind of service.

It is that property which must be maintained intact. It is that property which cannot be confiscated. The investment once made, dollars become property. The obligation is to maintain the property.

The recognition of the entire plant as one property has been quite clearly made by the United States Supreme Court.

"It is not easy to fix . . . the amount of depreciation of a plant whose component parts are of different ages with different expectations of life" (Knoxville case, 212 U. S., 1 Jan. 4, 1909).

"The work of reconstructing and replacing old parts by new in a plant of this kind must, in the very nature of things, be going on constantly" (Lincoln Gas case, 223 U. S., Feb. 19, 1912).

"It would seem to be inevitable that in many parts of the plant there should be such depreciation . . . but the appraisement is of an instrument of public service, as property, not of the skill of the users. And when particular physical items are estimated as worth so much new, if in fact they be depreciated . . ." (Minnesota Rate cases, 230 U. S. p. 352, July 9, 1913).

"There was testimony . . . that 'there may be depreciation in the units composing the roadway track and structures of the railroad, while there is no depreciation in the machine as a whole;'" . . . "The testimony . . . tended to support the conclusion . . . that the defendants' railway and structures were, as a whole, maintained throughout the years in question in fully as good condition . . . as at the beginning of the respective years." (*Nashville, Chattanooga and St. Louis vs United States,* 269 Fed. 351, Dec. 7, 1920.)

Reverting once more to the illustration of the Michigan Central Railroad. For fifty years before anyone commenced to discuss the subject of depreciation, this company replaced its ties and its rail

as they needed replacement and charged the cost to operating expenses. Rails declined and rose in price, ties increased in price many fold, but the replacements were made of *rail,* and of *ties,* not of dollars of cost. In the vast majority of cases no question of original cost of particular items was raised nor was any change made in the capital accounts. After regulation had been established and after accounting classifications were prescribed, the same practice was continued. Renewals were made and charged to operating expenses, to the rate payers. Regulation concerned itself with seeing to it that additions were not so charged.

There has been a clear distinction made in recent accounting that additions to capital should include changes in quality, size and capacity of items of property. A replacement of 80-lb. rail with rail of the same weight is an operating expense pure and simple, a replacement with 120-lb. rail adds to the quality and capacity and results in a better track of a higher type, hence the 40 lbs. of added weight is treated as a capital charge.

The original 25-cent tie on the old line of railroad was replaced by a new tie at 40 cents, that in turn by one at 70 cents, and that by one costing over a dollar, all without change in the capital account in the great majority of cases.

It has been definitely settled that no money shall be placed in capital accounts on which dividends are to be paid which is derived from charges against operating expenses.[1]

[1] *Louisiana Railroad Commission vs Cumberland Telephone and Telegraph Company,* 212 U. S. 414, on page 423, Feb. 23, 1909.

It seems clear that investment once made is capital. Capital is to be increased as the property grows through additional investment in new property or in larger property and is to be diminished as different parts of it come to the end of their lives and cease to be of service. Capital must be kept intact by replacements and so long as the entire cost of the replacement is charged to operating expenses without any change in the capital accounts the relative cost of the old unit and the new one replacing it would seem to be wholly immaterial.

The rate payer must furnish money for replacement or for reimbursing the owner for the cost of property abandoned. The burden of securing proper rates and of making proper provision through correct accounting is on the owner, and only in the case of his failure to do this is there depreciation in the sense of loss of value to be deducted.

CHAPTER III

THE INTEREST OF THE RATE PAYER IN THE PROPERTY

Owing to the public nature of the utility property, the fact that it is rendering a service that might be rendered by a property under public ownership and the fact that it enjoys rights and privileges granted by the franchise, government has been definitely held to have the right to regulate.

The people directly interested are the investor and the consumer or rate payer in the case of the privately owned plant, and the taxpayer and the rate payer in the publicly owned one.

Under either class of ownership, private or government, the utility should be wholly self-supporting and the payment of all proper operating costs should fall on the consumer of the product through a system of fair and adequate rates.

The penalty for failure to exact sufficient rates falls, in the one case on the general taxpayer in the form of taxes to make up the deficit in operation, a burden that is likely to be very inequitable, and to increase greatly the burden of taxation; in the other case it falls on the investor in securities of the utility. Whether this loss fall on stockholders

alone, or on both stockholders and bondholders, the effect is to destroy the financial standing of the property, to make it difficult or impossible to find funds for needed extensions or to cause the collapse of the business.

Neither public ownership nor private ownership in the United States has resulted in such marked success or failure that either one can be pointed to as the final solution.

There have been many complete failures under both plans. There have been many instances, under both, of investment in poorly conceived or ill advised enterprises which are operating under adverse conditions and at a serious loss. There are, under both plans, illustrations of conspicuously good properties, well managed and productive of fine results. The burden is on the management of the property to provide high enough rates to meet fully the requirements: Operating expenses, including sufficient to maintain the property fully, taxes, and in the case of the privately owned plant a fair return. In case of the publicly owned plant this return takes the form of interest on the bonds which in most cases furnish the entire funds for construction, and a sinking fund to retire those bonds. The requirement of operating expenses and the maintenance of the property are identical under both systems of ownership.

The writer cannot refrain from commenting, in passing, that in his opinion publicly owned properties should be under exactly the same regulation as the privately owned ones, and would benefit by that

regulation. Nearly all of the so-called publicly owned properties are built wholly from the proceeds of the sale of bonds to private investors. The bonds usually carry a lower rate of interest than on a similar private utility; but interest must be paid, the borrowed money must be paid back and the plant must be maintained. Regulation in the interest of the taxpayer and the investor in bonds would in many cases prove of inestimable value.

The user of the product of the utility is the one who demands the service. He must through the rates he pays furnish the money which is essential in order that the service may be given.

In any fair and disinterested consideration of the subject it will have to be conceded that the rate payer's interests are as follows:

1. He demands service—uninterrupted and fully adequate.

2. To secure that service he demands that the property be maintained always in that economic maximum of condition such that it can furnish adequate service and always insure safety. This involves not only repairs and current maintenance, but also that all replacements be made just as soon as safety or other economic conditions require them to be made.

3. He demands and is entitled to rates that are fair and reasonable. The burden should be equitable in all cases. The small consumer should not bear an excessive part of the cost in order that the large consumer may secure service at a rate that is too

low. There must be nothing approximating the old time discrimination or rebating.

4. He demands that he be not required to pay excessive rates for the purpose of paying a return on overstated capital or watered securities. There should be no attempt on the other hand to force an under valuation or to deny honestly and wisely made investment its reasonable return and guarantee of integrity.

5. The rate payer undoubtedly has legitimate ground for demanding that he be not required to pay a return on ill advised investment or the "losing venture." These cases, when they arise, are difficult to determine. The decadent property in the small, backward or slow growing community usually requires the highest of rates to meet the other demands than return on investment. No possible rule can be laid down for general application. The commission passing on the matter must of necessity exercise its best judgment. The matter is here referred to because the claim is frequently made, and not always properly so, that properties are over developed. There is a vast difference between development beyond immediate present requirements in a plant in a great and rapidly growing city, where the business is showing large increases each year, or in a business of such character that the commercial prosperity of a community or district is largely bound up in it, but which has not fully reached its full load; and a case of over development in a plant which has for a considerable

period of time demonstrated its inability to earn a return on its investment.

6. The rate payer is justified in demanding such a form of accounting as will effectively prevent his being required to furnish any money for enlargement of the plant through charges to operating expenses. It is not the intention to discuss here any question relating to *rate of return* or any disposition that may be made of surplus funds, the use of which is clearly a question of policy of the management.

"That it was right to raise more money to pay for depreciation than was actually disbursed for the particular year there can be no doubt, for a reserve is necessary in any business of this kind, and so it might accumulate, but to raise more than enough money for the purpose and place the balance to the credit of capital upon which to pay dividends cannot be proper treatment." (*Louisiana Railroad Commission vs Cumberland Telephone and Telegraph Company*, 212 U. S. 414, Feb., 1909.)

7. It is not a matter of concern to the rate payer how the management treats the accounting for replacement of property so long as the amounts raised for this purpose are enough to maintain fully the property to such a condition as is economically wise, but are not excessive enough to include charges for construction, addition or betterment. It may be the decision of the regulating commission or the policy of the management to do this either through direct charges of replacements to operating expenses, or by the creation of reserves for replacement or depreciation, or by the use of one method for parts

of the property and the other method for other parts.

"The Railroad Company may, if it sees fit, anticipate general depreciation, and make provision for them by establishing a reserve for that purpose; but if no such provision has been made the abandonments should be taken care of by charging them to present or future operating expenses." (*Kansas City Southern Railway Co. vs United States,* 231 U. S. 423, Dec. 1, 1913.)

8. The rate payer is interested in knowing that he is not being charged an excessive amount for depreciation either through a duplication of charges such as happens when replacements are charged to operating expenses at the same time that reserves are being built up, or through excessive charges to depreciation on account of obsolescence which is chargeable to future rate payers because of the economies which are secured by the new type of property.

"No such carrier shall in any case include in any form under its operating or other expenses any depreciation or other charge or expenditure *included elsewhere* as a depreciation charge or otherwise under its operating or other expenses." (Sec. 20, par. 5, Interstate Commerce Act as amended.)

"Abandonments occasioned by changes of this character are therefore chargeable to future earnings." (*Kansas City Southern Railway Company vs United States,* 231 U. S. 423, 451, 452.)

In summarizing it may be said that the rate payer, the user of the service, is the one who must support the enterprise. His need for the service resulted in the granting of a franchise and the building of a

plant. The character of the service is such that free competition cannot be depended upon to regulate price or quality of service, hence we have gradually come to regulation by governmental authority. The rate payer or consumer is primarily interested in service. To get that service he must pay a return sufficient to attract money to the business. The return on the investment, the fair return on the "fair value," is the incentive for building the plant and giving the service. When such a return is refused, money cannot be had for the business.

Just as long as the consumer who pays gets adequate service at reasonable and proper rates and is not compelled to pay charges which will support an ill advised investment, or fictitious capital or permit excessive charges to depreciation or improper charges to capital as part of the requirement made of him, he has no just ground for complaint.

It must be a mutual arrangement. Each party must know and respect the rights of the other. Failure to do this in the past has resulted in government regulation.

CHAPTER IV

OPERATING EXPENSES

When a property of any kind is built, and after operation is commenced, every item of cost which is chargeable to production is an operating expense.

For a long period of time, before the regulation of utilities, there was an evident failure to recognize a clear line of demarcation between capital costs and operating costs. This is manifest in some of the older decisions of the courts.

Even at present many owners and managers of property are misleading themselves and their stockholders by a failure to recognize the fundamental fact that there can be no real net earnings until every element of cost of operating expense, which properly speaking is the total cost of rendering service, is accounted for and deducted from gross income from operations. Failure to do this correctly results in over statement of net earnings.

These misconceptions are probably largely explained by the fact that the calendar year is the fiscal unit used in accounting. It is easy to understand that money paid out for the labor of operating a plant, or the money paid out for coal, oil and other consumable supplies used in operation during any

fiscal year are operating expenses belonging to that year. In the same way it is not hard to understand that replacement of short lived parts of the plant, which are renewed within the year are operating expenses.

It has been much more difficult to grasp the idea that the wearing out of consumable property, which has a life of two, three, five or more years, and which must necessarily be replaced in order that service may be continuous, is just as much a part of the cost of service as the labor or the coal.

Any replacement of property units used in operation, be the units large or small, which does not change the character of the property, or increase its size or capacity, is an operating expense, no matter how long the life of the unit may be. Two or three illustrations may make this clear.

In the operation of a gas plant in a large city the lining of the retorts needs renewal every three or four years while the retorts themselves will last fifteen or twenty years. The cost of relining the retorts is a part of the labor and consumable material connected with the making of gas, and is generally charged directly to operating expense. The cost of replacing the retorts is just as much a charge against the cost of gas although less evident. In a large plant the relining of some of the retorts takes place every year, so that a direct charge to operating expenses for the work done each year will not cause any material variation in the total amount of money charged to operating expenses in any one year over the others.

Another illustration is the railroad track on the line from Detroit to Chicago. The life of the ties is from eight to ten years, that of rail and fastenings under existing conditions of traffic from six to eight years, and all other elements of the track have a varying life of a few years. As the railroad is seventy-five years old, there have been five or six renewals of rail, ties and other items.

Except as there have been changes in weight of rail and other material, or as new property such as second track or block signals have been added, there has been no increase in the property. The same length of line is operated as at first. The additions make possible greater capacity for service. The rails have worn out in the furnishing of transportation in just the same way that the coal was burned in the locomotive in the furnishing of transportation.

A third illustration is the waterworks. Such a plant consists of a few large and long lived units of property. When a ten million gallon pump is replaced by another one the cost of the replaced pump can only be charged to the service of pumping water, and each million gallons pumped is properly chargeable with its proportion of the cost of the pump as an operating expense. The new pump, if of the same capacity as the old one adds nothing to the capacity of the property nor to its value.

For accounting purposes this class of operating expenses, replacement of units or items of property, group themselves into two distinct classes.

First, those which can be charged directly to operating expenses when the renewal is made without causing any material change or fluctuation of the ratio of operating expenses to gross earnings from operation; and,

Second, those which cannot be so charged without a violent fluctuation of the operating ratio.

Referring to the illustrations, it is evident that on a large property, replacements become fairly well distributed and do not recur at one period. Thus the lining of the gas retorts or the replacement of rail and ties will be in fairly uniform amount year after year on a large property. Direct charges of such replacements to operating expense will create no violent fluctuation and the property may be kept in good operating condition indefinitely without the establishment of any reserves. What is true of the large gas plant or the large railroad may not turn out to be the same on the small one. The tendency on the part of officers of corporations to hold off the making of expenditures during a period of business depression is likely to cause the largest variation in operating expense in a property which can be maintained through direct charges to operating expense. On the other hand the waterworks, having at most four or five pumps, one or two reservoirs, one or two standpipes and a system of iron pipes underground, constitutes an excellent example of a property on which renewals are not uniform, but which faces violent fluctuations of the operating ratio whenever major renewals do occur.

It is therefore not strange that it was the water-

works industry which first developed the plan of setting aside a reserve each year to offset the wear and tear and aging of that year. The waterworks men first used the term "depreciation," in the sense that provision must be made to overcome the gradual wearing out of large units of property, so reserves were created for the purpose of making replacements.

It is unfortunate that this meaning has been given to the word depreciation. While the use in the case of the waterworks is perhaps more fully descriptive than any other term, the fact remains that there is another use of the word depreciation in public utility regulation practice, in which it has been given a distinctly different meaning.

Inasmuch as the primary meaning of the word is *loss of value,* and as the second use of the word has direct reference to that loss of value, in utility properties, which should be deducted in finding a base for rate making, it would seem that the use of the word might advantageously be dropped in accounting practice, and the terms Reserve for Replacement and Allowance for Replacement used instead. It has also been suggested that the word *retire* be used instead of *replace.* Inasmuch as some of the State Utility Commission accounting circulars have already adopted the term *replacement* instead of "depreciation" this practice is advocated, although either word, *replace* or *retire,* would be proper, and correctly describe the thing that takes place in a continuing property.

Where the retirement is not accompanied by re-

placement as happens when a piece of property is abandoned and the service discontinued, there is real justification for the use of the term depreciation.

Much of the misunderstanding regarding the subjects of depreciation and replacement of property and of accounting methods for overcoming the deterioration due to different causes is undoubtedly due to the confusing use of the word "depreciation." It has been given different meanings and shades of meaning and has been compounded with other words until a perfect maze of confusing jargon has been put forward in the attempt to clarify the subject. One of the first things that needs to be done is to clear away a tangle of words and terms. If one of the meetings of the members of the different regulating commissions of the United States would devote a session to this subject and would agree upon a few simple terms with definitions it would be a real service.

The accounting practice of many years has recognized the propriety of charging replacements directly to operating expense accounts, especially in the case of such items as rails, ties, track structures, poles, overhead lines and other structures where great numbers of units exist on one property.

While the creating of reserves for replacement is of comparatively recent origin, as has been pointed out, it has had the approval of courts and commissions, and has been strongly urged by many utilities. In recent months there has been a tendency to note some danger in the practice. Like many another

good thing, it is not only capable of abuse, but it is undoubtedly being abused.

The Interstate Commerce Commission recognizes and prescribes both methods in its accounting classifications. The Supreme Court of the United States in its decisions has recognized both methods and has distinctly held that the replacement of property was a proper charge against the rate payer.

There should be considerable latitude left to the management of the corporation in the matter of selection of accounting methods, as there is such great diversity of conditions on different properties. Identical units of property owned by one corporation may be charged by the replacement method, owing to a large number of such units, while another corporation having but a few units may find that the replacement method is not nearly so desirable as it is to create reserves and spread the charge to operating expenses over a longer period.

One question which is open to debate in connection with the subject of replacements as operating expenses, is whether the charge should be of the cost of the original unit, any excess cost being charged to capital, or whether the cost of the new unit should be directly charged to operating expenses without any readjustment of the capital accounts.

Regardless of the accounting method which may be adopted, the fundamental truth that must be recognized by everyone is that the cost of maintaining the property and replacing all parts of it as those parts wear out, is an operating expense, a cost of

rendering service. Unless it is so recognized and accounted for, earnings will be overstated, and the property will not be kept intact.

It must also be kept in mind that the chief reason for the insistence upon reserves for replacement is, not the benefiting of the company, but the protection of the patrons of the company by insuring continuity of service and providing means to enable the company to make the necessary replacements as they become due.

CHAPTER V

WAR PERIOD PRICE FLUCTUATIONS

COMMENCING in 1914 with the beginning of the war in Europe prices of commodities of all kinds and of labor rapidly increased, reaching the maximum late in 1920. Prices dropped to a considerably lower level in 1921 than prevailed in 1920; but they are still far above pre-war prices, indeed are well above the level that prevailed during the early years of the war in Europe.

This increase of costs materially affected the utilities which were operating under conditions of price regulation, especially those whose rates were fixed by contract.

These price fluctuations came just at a time when the practice of valuation was becoming reasonably stablized and rules and methods of valuation were being formulated and quite generally accepted and followed by the engineering profession. The most complete statement of principles and methods of valuation which has ever been published is the final report of the Special Committee of the American Society of Civil Engineers, presented on Jan. 17, 1917 and published in Vol. 81 of the *Transactions* of that society.

That report was prepared during the years 1913 to 1917, at a time when price fluctuations caused by the war in Europe had hardly begun to be felt in the United States, and before the entrance of this country into the war was imminent. The conclusions of this committee as to proper prices to use in making an estimate of the cost of reproduction are found on page 1372 of the report and are as follows:

"The Committee believes that the foregoing decisions require the use of present rather than original prices in estimating reproduction cost. It recognizes, however, that undesirable fluctuations in the estimated value of property valued at intervals would occur owing to changes in prices. It suggests that this may be avoided and the value from year to year of a property which has been once properly valued may be determined if proper methods of accounting are adopted.

"In the case of a new or recently created property, which has had from the beginning, under continuous and proper regulation a modern system of accounting, which has taken account of all proper capital charges and credits, so that the amount of invested capital would be known at all times, such invested capital would be entitled to greater weight on equitable grounds as an indication of the so-called 'fair value' than an estimate of cost of reproduction less depreciation which might involve radical changes of prices; but we are not now discussing original cost to date, nor what is the proper basis for 'fair value.' For reproduction cost the Committee recommends that, in estimating, the prices prevailing at the assumed time of reproduction shall be used, meaning the normal prices obtained by averaging prices for a proper period, as is fully discussed subsequently in this chapter under the caption 'Unit Prices.'"

The caption referred to is entitled "Shall Average Prices, or Prices as of a Certain Date be Used?"

On page 1383 the following conclusions of the Committee are given:

"The practice, adopted on some recent appraisals, of using a price derived from a weighted average of actual purchases over a period of from five to ten years on the property under investigation, has the merit of using actual investment in recent years as a basis for determining a unit to be used on the entire property, and meets the objection raised by the Second District Commission of New York.

"Present-day labor prices can be determined by an analysis of pay-rolls over such a length of time as will give proper actual averages for each class of labor. By a comparison with similar data derived from records of other properties in the immediate vicinity, prices may be derived which are actual and are capable of proof. Prices thus determined would seem to be proper bases on which to build up estimates of total labor entering into the various units.

"Any price which is used must be a matter of judgment, in the light of all available facts, but the arbitrary selection of a certain specific date as the date of appraisal does not seem to justify the use of prices which are abnormal. However derived, the prices used for fluctuating materials should be proper for the estimated period of reproduction which should end with the date as of which the investigation is made, and which should be sufficiently stable so that no reappraisal within a short time thereafter should make violent changes in estimates of reproduction cost."

At the time of the drafting of this report (1916 and prior years), it was contended, and the contention had the full approval of the courts, that in the absence of records of actual cost, the cost of reproduction method of valuation was a proper method, and gave the most reasonable basis for fixing fair value when actual investment was not ascertainable.

The Cost of Reproduction method was first used, and the name was first applied in large valuation work, on the Michigan Railroad valuation of 1900, by Professor M. E. Cooley. This was the first state wide valuation to be made. Prior to 1900 there had been a small amount of railroad valuation work in Texas and a few waterworks valuations throughout the country, but no recognized standards had been created for doing such work. Professor Cooley first advanced the reproduction theory, under that name, as a rational plan for determining value in the case of a large number of old properties whose original cost could not be ascertained, many of them had very incomplete records of property. It must be remembered that this pioneer work was done seven years before the passage of the law requiring uniform accounting and before any of our state commissions had undertaken to regulate accounting.[1]

This method was adopted and amplified in the making of many subsequent valuations and the development of fifteen years' practice is fully set forth in the report of the American Society of Civil Engineers Committee. It will be particularly noticed that the recent contention for the use of extreme high or low prices as of a given date had not appeared at all in 1916 (at the time when the final report of the Committee was drafted) and that the committee argued for the adoption of average prices applicable

[1] For description of this work see "The Valuation of Public Service Corporation Property," by Henry E. Riggs, *Trans. Am. Soc. C. E.*, vol. 72 (1911).

at the time of the making of the valuation. The Cooley 1900 appraisal used a five-year average, and nearly all appraisers up to the year 1917 aimed to secure unit prices that did not reflect abnormal market conditions but which did fairly reflect investment cost of the property.

Commencing with the sharp increase of prices in 1917, the utilities faced the worst crisis of their history. Rates were fixed in most cases by the authority of some Regulating Commission or by contract, and the rapid rise in operating costs which took place between 1916 and 1920 forced many of the companies to the verge of bankruptcy.

The courts and regulating commissions promptly took the ground that increased operating expenses due to the abnormal condition must be allowed. The contention was strongly urged by some of the companies that earlier court decisions, prior to Jan. 1, 1917, sustained the use of the reproduction theory in all cases, and that prices as of the date of the inquiry were the proper prices to use. This would of course result in higher figures of "fair value" on which the return would be based. It is to be noted that this new construction was first suggested in cases coming up for hearing in 1917, 1918 and 1919.

As the writer has always construed the earlier decisions of the courts, and as he recalls the details of his own practice, and the discussions of the American Society of Civil Engineers' Committee, he feels justified in stating that the courts accepted the Cost of Reproduction method with reservation. The writer knows of no cases prior to the war in which

the contention was made by reputable engineers, or sustained by court or commission that extreme maximum or extreme minimum prices as of a given date were proper to use in a valuation unless it were shown that there was actual investment in property at such prices.

The contention, that early court decisions to the effect that the value to be found should be as of the date of the investigation, "at the time of inquiry," means the use of prices as of a certain day, which may be 100 per cent in excess of actual investment, or less than actual investment, is a new contention first advanced by the utilities when facing the stress of war-time conditions.

The adoption of this plan resulted in greatly increased valuations from 1917 to 1921, especially in 1919 and 1920, but the results are far from uniform and tend to give the greatest increases over actual investment to the older properties, and to those doing but a small amount of extension during the period of high prices. This is well illustrated in the case of two large electric light and power properties in two large cities.

One, a strong company with a large and rapidly growing business, was called upon to meet the demands of industry during the war period by making extensions and additions at more than double the rate of pre-war construction. During the four years 1917 to 1920 inclusive its new extensions have cost several millions of dollars per year amounting to a total almost as large as the valuation of its entire property made in 1915.

The other property located in a city of several hundred thousand population had a plant built prior to the war, with a power station which was commenced prior to 1900 and completed in its present form in 1915 or 1916. The increase in business during the war period, which has not proven permanent, was taken care of by purchased power, so that the new construction consisted wholly of transmission and distribution lines, and aggregated less than one million dollars or about one-tenth of the figure that a pre-war valuation would have shown.

In the one case a valuation in 1920 using July, 1920 prices would have shown an increase of from 50 per cent to 60 per cent above the actual investment while in the other case of the less valuable property it would have shown an increase of over 100 per cent above the investment.

If prices should drop to the pre-war level in the next few years, and a revaluation of the identical properties are made at that time, the better property will have a reproduction cost 25 per cent *less than investment,* while the less valuable one will approximately equal the investment.

Public Utility Commissions have been faced during the past few years for the first time since their establishment with the problem of making rates and determining values during a period of greatly unsettled prices.

No one can predict with any degree of certainty just what conditions will prevail at any fixed time in the future. The records of price fluctuations of the past are something of a guide, but we cannot

base forecasts on the curves of prices of the Civil War period with any certainty on account of radically different conditions existing today from any which have ever existed before. The Great War differs from the Civil War in that the whole world was involved, while from 1860 to 1865 only the United States was affected. This is shown clearly by a study of price curves of the United States, England, France and other countries. The American Civil War hardly affected European prices.

The great loss of capital and of man power, especially in Europe is bound to have its effect for a long number of years.

The prices of October, 1920 stood at 225 per cent of 1913. By February, 1921 they had fallen to 160 per cent and for the entire year 1921 have been at a still lower figure. We may expect considerable fluctuations in the curve but we are fully justified in looking for a general tendency of prices downward. It took over twenty years for prices after the Civil War to return to the level which prevailed before the war.

It is not amiss to estimate that it will take a term of years, but the estimate must be modified by taking into account the fact that the United States of today is not at all comparable with the United States of 1865. Our wealth today is so great and our commerce, manufacturing and agriculture are so well established as not to be comparable with conditions at the close of the Civil War when we had just come through four years of war at home and when the southern states had been so wrecked

that it has required half a century for them to build up to approximately the same condition as to wealth as existed in 1860.

As far as we ourselves are concerned we might expect a quick return to normal were it not for the condition of European nations. There are so many factors which will affect trade conditions and prices that the business of long range prophecy is risky in the extreme. It is hardly to be presumed that courts and regulating commissions will indulge in much of this sort of thing.

The effect of the changes in price level has been to give rise to two opposing theories concerning the proper basis upon which to fix rates.

One insists that rates shall be adequate to pay operating expenses, depreciation and a fair return *on the investment which the property represents.*

The other theory insists that the "fair value" of the property at the time the rates are in question shall be the basis of rates. If that value is less than the investment the loss shall be borne by the owner of the property, if it be greater than the investment the owner shall enjoy the advantages of the enhancement in value. This theory makes cost of reproduction as of a given date synonymous with "fair value."

One theory argues that the rates of return shall be variable, rising or falling to meet the varying conditions prevailing in the business world, the other contends that the *value* should be variable.

This is a statement of the theories as they must be analysed. It would appear that some have con-

tended for the theory of fluctuating value at a time when it would most benefit themselves, and have at the same time argued the condition of the money market in support of a claim for increased rates of return.

The most marked effect of the change of price levels has been to increase labor and material costs of both operating expenses and construction to a point approximately double the costs of pre-war years during the years 1919 and 1920, the period during which there was much activity in rate regulation, and a number of cases reached the courts.

The questions to be answered, therefore, may be stated as follows:

First. In valuation shall prices as of any given date, or prices averaged over a term of years be used? Or shall investment be accepted?

Second. Shall reproduction be accepted as the basis, even in cases where actual investment is capable of determination?

Third. If the actual operating costs are recognized, as they properly have been, is there justification for increasing capital values on account of high costs of reproduction even in cases where there has been no investment at such figures?

Fourth. In case of replacement of property at prices greatly in excess of the original cost of the property which is retired, shall the entire cost of the replacement be considered as an operating expense, or shall the excess cost of the new thing over the old be capitalized?

CHAPTER VI

FAIR VALUE AND THE RATE OF RETURN

THE whole development of valuation of public utility properties is based on the decisions of the United States Supreme Court holding that there must be a fair return on "Fair Value."

"The fair value of the property being used by it for the convenience of the public." "What the company is entitled to ask is a fair return on the value of that which it employs for the public convenience." (*Smyth vs Ames,* 169 U. S. 466, March 7, 1898, p. 546.)

"The fair value of its property devoted to the public use." "The value of its property actually used for the public." (*Willcox vs Consolidated Gas Company,* 212 U. S. 19, Jan. 4, 1909, p. 50.)

"The basis of calculation is the fair value of the property used for the convenience of the public" (Minnesota Rate Cases; *Simpson et al vs Shepherd,* 230 U. S. 352, June 9, 1913, p. 434).

As has been brought out, valuation practice was developed during the period covered by the above quoted decisions. The cost of reproduction was evolved to meet a condition which made something of the sort necessary, but the consensus of engineering opinion before the war was that actual investment on recently-built properties formed the

best possible basis for determining "fair value." The better accounting methods of the past twelve or fifteen years have gone far to eliminate the conditions which made necessary the early use of the Cost of Reproduction method, and as far as newly built properties, additions, and replacements are concerned actual investment can be determined in most cases.

It must be here again emphasized that up to 1913 the courts accepted cost of reproduction, in the absence of a better basis, but with reservations.

"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." . . . "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." (Minnesota Rate cases; 230 U. S. 352, June 9, 1913).

While prices in the United States had gradually risen from 1896 to 1915, many of the processes of construction had been so greatly improved that with few exceptions unit prices did not show any great change. Steel rails stood at the same figure for many years, and while some commodities such as

ties and timber were higher, others like cement were lower.

The large volume of construction in the later years of the period, especially in electric light and power and telephone utilities tended to make the actual investment considerably higher than any reproduction estimate would show, especially if made at the period of low prices. As a matter of fact replacements made between 1896 and 1915 were probably sufficiently extensive to bring the actual cost of existing property well up to the 1910 level. In other words a properly made reproduction estimate in the period 1910 to 1915 represented approximately the actual money expended on the property up to the same date, although it is probable that more or less of this money had been expended for replacements which had been charged to operating expenses.

A 1920 valuation, on the basis of 1920 prices, would give a figure more than double the actual investment in the case of old properties. The older the property and the less its growth after 1915, the greater would be the discrepancy between investment and reproduction.

When the corporations began appealing for relief in 1916 and 1917, and valuations were made using the then cost of reproduction, the commissions generally took the position that pre-war prices constituted the correct basis and that prices of the two or three years later were abnormal.

One interesting and significant case is the *Brooklyn Borough Gas Company vs Public Service Com-*

mission for the First District of New York, P. U. R. 1918F in which former Justice Charles E. Hughes, who wrote the Minnesota rate case decision, acted as referee. This case was decided in July, 1918, a few months before the close of the war, in the midst of a world-wide confusion. It is quoted for the purpose of pointing out the parallel between this decision and the Minnesota rate cases already quoted[1] in the matter of "hypothetical estimates." Judge Hughes held that:

"To base rates upon a plant valuation simply representing a hypothetical cost of reproduction at a time of abnormally high prices due to exceptional conditions would be manifestly unfair to the public, and likewise to base rates upon an estimated cost of reproduction far lower than the actual bona fide and prudent investment because of abnormally low prices would be unfair to the company . . . To take as the basis for a compensatory return an asserted plant value far above the actual investment which is reached merely by expert estimates of a cost of reproduction under abnormal conditions . . . would result in allowing a public service corporation to take advantage of a public calamity by increasing its rates above what would be a liberal return, not only on actual investment, but upon a normal reproduction cost . . .

"When the value of a plant has been properly determined by the regulating authority, and suitable allowance is made for the investment in subsequent additions, it is manifestly proper to calculate the fair return upon this basis, at least for a reasonable period. In the present case, the interval has been one of unusual circumstances incident to war and of especially high costs, and there is no reason why there should be substituted for the official appraisal a hypothetical estimate of reproduction cost under abnormal conditions reaching an amount vastly in excess of the actual investment."

* See page 44.

Following this decision, the general tendency on the part of the various state commissions was to hold that either an average of prices over a term of years, or a recognition of actual costs on parts of the property built during a period of high prices combined with pre-war costs on old property constitutes a reasonable basis.

There is a distinct note of conservatism in the earlier Supreme Court decisions regarding the use of standards which rest on pure hypothesis, and nothing could be more conjectural or hypothetical than to place a so-called "value" on a unit of property, such as an electric power house built twenty or more years ago and of a type now obsolete, which is from 100 per cent to 125 per cent in excess of its known actual cost.

On June 2, 1919, the United States Supreme Court decided the Lincoln Gas and Electric Light Case, 250 U. S. 256. Justice Pitney says:

"The decree ought to be modified so as to permit complainant to make another application to the courts for relief against the operation of the ordinance hereafter, if it can show, as a result of its practical test of the dollar rate since May 1, 1915, or upon evidence respecting values, costs of operation, and the current rates of return upon capital as they stand at the time of bringing suit and are likely to continue thereafter, that the rate ordinance is confiscatory in its effect under the new conditions. It is a matter of common knowledge that, owing principally to the world war, the costs of labor and supplies of every kind have advanced since the ordinance was adopted, and largely since this cause was last heard in the court below. And it is equally well known that annual returns upon capital and enterprise the world over have materially increased, so that what would have been a

proper rate of return for capital invested in gas plants and similar public utilities a few years ago furnished no safe criterion for the present or for the future."

A careful reading of this does not indicate that *value* is to be considered as variable. The cost of operating expenses during the war period, and the rate of return for capital invested are the two elements specifically mentioned.

There is nothing in the Lincoln Gas case which would support a valuation as of a date when extreme high prices prevailed as a base for making rates and determining return *provided* sufficient rates were allowed to permit the payment of operating expenses necessarily incurred at a time of high prices and a rate of return on investment which was adequate to meet the conditions of the times.

The year 1920 saw the highest prices which had been reached in the United States in over fifty years. The extreme peak was reached in the autumn of 1920. During the months when prices were soaring to this peak several cases reached the Federal Courts and State Supreme Courts, and were decided in the autumn of 1920 almost at the time of the extreme maximum of prices.

The Elizabethtown Gas Company case decided by the Supreme Court of New Jersey on Aug. 7, 1920; The Consolidated Gas Company case decided by the District Court Southern District of New York on Aug. 11, 1920 (267 Fed. 231); The St. Joseph Light Heat and Power case decided by the United States District Court for the Western District of Missouri on Nov. 10, 1920, P. U. R. 1921

A 540; and *Landon vs Kansas Court of Industrial Relations,* decided by the United States District Court of Kansas on Dec. 22, 1920, P. U. R. 1921 A 807; all squarely hold for reproduction at prices as of the time of the investigation as constituting a fair rate base.

While these cases constitute a strong argument for the advocates of valuation of all property at prices then prevailing irrespective of the time of construction or of the actual investment, it seems that one would do well to pause before accepting these dicta as the final word on valuation.

In considering the Consolidated Gas case, 267 Fed. 231 it must be remembered that this case was decided Aug. 11, 1920, at the extreme high peak of prices. Bradstreet's Commodity Index, plotted as a curve shows a steady rise from 8.6 in 1914 to 19.2 in 1918 with a fluctuating curve reaching 20.7 in April, 1920 and 19.3 in July, 1920.

It is interesting to conjecture what this decision might have been a few months later when prices had dropped to less than twelve. These were the conditions which caused the court to say:

"Several reasons lead me to believe that present price levels are not merely transitory, though I recognize the danger of any prophecy. Whatever their precise cause, it is universally conceded to be due to the Great War, and by that I mean, of course, not to the prosecution of hostilities, but to the economic exhaustion and inflation of the circulating medium which these involved. In general, it is a safe inference to suppose that Europe will not be able to resume its ante bellum production for a time measured rather by years than by months, and that the recovery of a sound financial condition will take longer. We in this country are not

only influenced by conditions in Europe, but we are subject to our own local inflation and disorganization of industry, from which no one can know when we shall recover. The question is a practical one, and comes, I think, down to this:

"The plaintiff is faced with a condition which permits it to receive much less than the return which the statute contemplated, and which the Constitution is thought to insure it. So far as human foresight can see, that condition, though probably not permanent—certainly in its present exaggerated form—is bound to exist over a period of some years, at least in such things as coal, oil, and labor, which are the plaintiff's chief costs. There is, then the certainty of a continued loss for an indefinite, but substantial, time, due to causes which were not in existence and could not possibly have been apprehended 14 years ago, when the rate was fixed. Does this prospect justify the court in abandoning the inertia which it properly feels when the complaint is based upon temporary variations? Is it fair to continue to impose a rate which has clearly ceased to correspond with the underlying presuppositions upon which it was based? I think that the prospect does justify the court, and that the rate has become unfair, at least until the conditions change."

This case was appealed and the Supreme Court rendered its opinion on March 6, 1922. In this opinion the court modifies the decree of the lower court and affirms it as modified, remanding for further hearings.

There is no discussion of the question of basis for rates which gives a clear idea as to what the court may finally decide, but it seems to be significant that Justice McReynolds quotes from the report of Special Master A. S. Gilbert, the following conclusions:

United States Supreme Court, Advance Opinions, April 15, 1922, p. 305:

"On the basis of the prices, rates of pay, and costs prevailing during the eight months beginning Jan. 1, 1919, the cost of making and distributing gas has been such as to allow a very small, if any, return, on even the actual investment; and since Sept. 1, 1919, the cost of making and distributing gas has been increased in a number of respects so that the fair inference is that the complainant company now finds itself without any return upon the investment. The conditions found by me have existed for more than a year last past, and to a lesser degree for at least a year before that time, and will continue for at least a considerable period of time, the end of which cannot now be forecast. Upon such a situation and such a prospect, I think that the complainant company has shown itself, clearly and beyond all reasonable doubt, entitled to relief from the statutory limitation on its rates, but that its rate of return should be calculated, not upon the present high reproduction cost of its property, with or without the deduction of observed or actual depreciation, in whatever manner computed, but upon the actual, reasonable, investment in the property devoted to the service of the complainant's consumers."

After the cases in the Federal Courts referred to were decided, and these cases form the chief basis for the argument for higher prices, the Galveston case was decided, by the District Court of the Southern District of Texas on Feb. 10, 1921, and affirmed by the Supreme Court on May 15, 1922. District Judge Hutcheson holds, *Galveston Electric Company vs Galveston,* 272 Fed. 147, on pages 156 and 157:

"It was the view of the master, and I adopt it, that the prices obtaining at the time of the valuation were transitory, or, to use the language of the Supreme Court in the Lincoln Case, it was his view that they were not 'likely to continue thereafter.' It was his view, and I concur with him, that a price level of about

one-third above the agreed cost submitted to him could reasonably be assumed to have sufficient permanency to base a finding on.

"The Supreme Court has, in 1919, stated that it was a matter of common knowledge that costs of labor and supplies of every kind have greatly advanced. I think it is equally a matter of common knowledge that all of these costs are on the decline, and just as in the last half of 1919 and the first half of 1920 the phenomenon of higher and yet higher prices was of worldwide scope and universal experience, now the phenomenon of lowering and ever-lowering prices is equally manifest.

"In the hearing before me supplementary to that before the master, the evidence as to price trends was marked. Indices on commodity prices furnished by the Bureau of Labor Statistics showed a decline from September, 1920, which were the figures obtainable when the master made his report, from 250 to 189 on all commodities, with an accelerating drop for each ensuing month, and the testimony sustained this view. Since that time, the current financial news of the world, which I think is a matter which this court can take judicial knowledge of, as shown in standard financial publications, is to the effect that the process of deflation has not been completed; that there are still many channels in which the price reductions recorded are inadequate to meet the requirements for a return to stable conditions; that these reductions are not only coming in materials, but necessarily in the labor which enters into their production, increased and hastened by the great increase in unemployment, the shutting down of plants, and the resumption of such as do resume on wage reductions.

"According to the Bankers' Commodity Price Index, the average price of all commodities was on Jan. 1, 1920, 439.30 compared with 358.77 on Aug. 1, 1914, or an increase of approximately only 33⅓ per cent. Nothing, however, in any of these views, leads me to believe that a permanently lower price level may reasonably be reached for some time to come than the one taken by the master of 33⅓ per cent, and his finding on this point will therefore be adopted by me without change."

In the Supreme Court decision (—— U. S. ——

Advance Opinions No. 13, May 15, 1922, p. 383), Justice Brandeis does not finally settle this contention as to the base value, but he does clearly indicate that certain elements are not to be included:

"First, As the base value of the property, master and court took—instead of the prudent investment value—the estimated cost of reproduction at a later time, less depreciation; and, in estimating reproduction cost, both refused to use as a basis the prices actually prevailing at the time of the hearings. These had risen to 100 per cent above those of 1913. The basis for calculating reproduction cost adopted by all was prophecy as to the future general price level of commodities, labor, and money. This predicted level, which they assumed would be stable for an indefinite period, they called the new plateau of prices. As to the height of this prophesied plateau, there was naturally wide divergence of opinion. The company's expert prophesied that the level would be 60 to 70 per cent above 1913 prices; the master, that an increase of 33⅓ per cent would prove fair; and the court accepted the master's prophecy of 33⅓ per cent."

This case is of chief interest in its discussion of going concern values. This subject is not under consideration in this volume but the conclusion of the court does bear definitely on the question of "fair value." It is quoted for that reason:

"Nor is there evidence in the record to justify the Master's finding that a business brought to successful operation 'should have a going concern value at least equal to one-third of its physical properties.' Past losses obviously do not tend to prove present values. The fact that a sometime losing business becomes profitable eventually, through growth of the community or more efficient management, tends to prove merely that the adventure was not wholly misconceived. It is doubtless true, as the Master indicated, that a prospective purchaser of the Galveston system

would be willing to pay more for it with a record of annual losses overcome, than he would if the losses had continued. But would not the property be, at least, as valuable if the past had presented a record of continuous successes? And shall the base value be deemed less in law if there was no development cost, because success was instant and continuous? Or, if the success had been so great that, besides paying an annual return at the rate of 8 per cent, a large surplus had been accumulated, could the city insist that the base value be reduced by the amount of the surplus? Compare *Newton vs Consolidated Gas Company,* decided March 6, 1922, U. S. ante, 306, 42 Sup. Ct. Rep. 264.

"Going concern value and development cost, in the sense in which the Master used these terms, are not to be included in the base value for the purpose of determining whether a rate is confiscatory.

* * * * *

"The appellant insisted also that the base value should be raised by assuming that the future plateau of prices would be 60 to 70 per cent above the historical reproduction value, instead of 33⅓ per cent, as the Master and the court assumed. The appellees insisted, on the other hand, that an item of $142,281 for grade raising, included by Master and court in the historical cost, should be eliminated. We cannot say that there was error in overruling these contentions."

Two other Supreme Court cases, decided in the spring of 1922 must not be overlooked.

Newton vs. New York and Queens Gas Company is notable in that the Master's report is presented in full as part of the Federal Court's opinion (269 Fed. 277) and was given full approval. Justice McReynolds in a short opinion handed down on March 6, 1922, Advance Opinions, April 15, 1922, p. 309, affirms the decree of the Federal Court.

The Master accepts actual investment in the prop-

erty as the basis of fair present value. See Appendix.

The last case to be decided was *City of Houston vs Southwestern Bell Telephone Company,* decision May 29, 1922, Justice Clarke said:

> "We think . . . that the proper basis for rate making in the case is the fair value of the property, useful and used by the company, at the time of inquiry."

The net result of the recent decisions would seem to indicate that both advocates of the theory of Investment, and those of Valuation as of the date of inquiry, have grounds to hope that there is a decided prospect of a decision favorable to the contention which they support.

It certainly is an open question. The cases decided have all been such that this issue was not controlling.

Unless a rate of return on any property is high enough to permit the owners of that property to go into the financial markets and secure the money necessary for making needed extensions to the property, it is not an adequate rate. It would appear that there should be little ground for controversy regarding the claim that in order to be "fair" a rate must be such as would attract capital to the property.

Such being the fact, in times of stress such as we have been going through, with rates for service of all kinds being constantly changed, it would seem to be clear that when a property which had been able to borrow money at 5 to 6 per cent is compelled

to pay 10 or 11 per cent or more, there must either be an increase in the rate of return allowed on the property or that the growth of the property must be immediately restricted.

While the same result is obtained, in dollars, by doubling the value of the property at the old rate of return, as would be obtained by doubling the rate on the original valuation, it would seem to be a wiser policy to adopt the latter course.

The Indiana Public Service Commission, *in re Laporte Gas and Electric Company,* P. U. R. 1921A, 824, decided Dec. 22, 1920, holds that one of the most important considerations in determining fair value for purposes of rate making is the elimination of "the speculation, hazards, and destructive reverses to which non-utility property constantly is subjected." The commission holds that:

> "The most certain and effective method to do this is to adopt a principle which will insure a lasting stability to utility values. The surest and most equitable method of insuring stability of values is to consider prudent investment as the primary factor of value.
>
> "Facing as this country does, a period of economic uncertainty, there is now a dire need for the stabilization of utility values. Values and service go hand in hand, and, if values are unstable or impaired, service may likewise be unstable and impaired.
>
> "The investment principle insures the utility against the evil effects of recurrent fits of economic fortune, which under any other theory of valuation must in varying degree be suffered by public service companies."

From the standpoint of sound economics the large group of public utility properties which have been

built with due regard to business judgment and which serve a real need in the communities in which they are located should be put on a basis of the utmost stability.

We are securing excellent results from the regulation of these properties. The whole trend of regulation of capital issues and of accounting has been toward stabilization, the elimination of the speculative element in securities, and the compelling of such methods of accounting as will properly differentiate between capital expenditures and operating expenses.

No valuation can be made which inflates capital to a point far beyond actual investment without challenging the strenuous opposition of the rate payers, and when such valuation is coupled with a demand for higher rates on account of existing market conditions a burden is placed on the rate payer which is bound to increase the opposition.

One does not need to double both the valuation of his property and the rate of return in order to secure justice. The problem is to secure justice, and at the same time to secure stability of values and freedom from costly litigation.

So-called sound investments, such as investment in bonds, or mortgages or a deposit in a savings bank are not increased in amount when the value of the dollar changes. It is true that investments in public utilities are not like investment in bonds and mortgages, but it is equally true that they are not like investments in unregulated business free to earn all that they can. The hundreds of millions

of dollars of public utility securities outstanding when the war commenced did not have their face value increased nor yet their rate of return. It was only in the relatively small percentage of cases where a refinancing was necessary that the owners of such securities forced any better bargain from the utilities than the one first made.

The argument has been advanced that the present day reproduction cost is the proper figure because in the event of a sale of the property this price would prevail. The answer to this argument is that there are no sales of such properties being made at times of maximum prices.

Many illustrations may be found on a large property, of replacements of large units at prices greatly in excess of the cost of the original unit. One case was that of a generator unit at $23,000 replacing an old one which cost $11,000. The replacement was of *property,* not dollars. The present sale value of the generator was more than twice as many dollars as formerly. They were cheap dollars. Their purchasing power was no more than that of the original smaller number of dollars. The relatively few such cases on the majority of properties do not justify the sale argument. It may be granted that a sale price would have to be high enough to give the seller sufficient dollars to buy as much as he could have bought originally with his original money in hand. There has been no market for utility properties during the period of peak prices. No sane business man would invest under the conditions shown by

the companies in their presentation of arguments for higher rates.

In 1921 a memorandum was filed with the depreciation section of the Bureau of Accounts of the Interstate Commerce Commission, bearing on depreciation charges, by Robert A. Carter, Chairman of the Committee on rate fundamentals of the American Gas Association, and William L. Ransom of the New York Bar.

The following statement is quoted from page 3 of this memorandum:

"We desire greatly, in the first place, to furnish an efficient and acceptable service to all our consumers and patrons, and, in the second place, to charge them a rate no higher than is absolutely necessary to reimburse us for operating expenditures actually made, and yield, in addition, a fair return on our actual investment as judicially established. We adhere to that standard in the fixation of the rates charged by our companies; we desire that railroads and regulated utilities whose service we require in the carrying on of our business, shall do the same thing. The amount of money which we have to pay out for freight rates becomes a large item in our operating costs; and we, in turn, as patrons of railway service, do not wish to pay excessive rates or rates inflated by fictitious charges, in the guise of operating expenses or anything else."

One of the most thoughtful analyses of the legal decisions bearing on the subjects of fair value and of fair return is that of Professor Edwin C. Goddard in *Michigan Law Review* for January, 1917. His conclusions in part are as follows:

"In conclusion may we hope for the adoption of one clear and definite theory of valuation to the exclusion of all others, except as they may be needed, for a time, in checking uncertainties or

supplying deficiencies because of lack of reliable records or proper systems of accounting? A satisfactory answer to this question must rest on something more fundamental than a comparison of the workableness and relative advantages of the various theories. It must rest upon the basic principles of the relations of the public to public utilities. A public utility is something the public needs. It may build the utility as a public enterprise or leave it to private capital. If it pursue the latter course it practically says to capital, construct and manage the utility reasonably and the public will make every reasonable effort to insure a fair return on the investment. Fancy prices and fancy profits alike are not allowed, but steady, reliable promise should attract capital. The returns should be primarily what is fair, first and foremost, to the public, and second to the public service, in every case to both, if possible. Enough has been said about what is fair to the public, the rate must be reasonable. Then, if consistent with such reasonable charge to the public, the public must allow the service to earn a reasonable return. But on what? Much of the difficulty here arising is due to a failure to distinguish between investment in private and in public enterprises. Public utilities have been speculated in like private business adventures, but nearly always with results disastrous to the public receiving the service, and to most of the public investing in the securities. What the public needs is a stability in the public service property that will attract sufficient capital to furnish satisfactory services. The great majority of those furnishing the capital seek a safe and sure return, not on speculative values but on money adventured. The few who may have grown very rich or very poor in speculations in public utilities may be dismissed. Their interests are usually adverse to the good, alike of the public and the ordinary stockholder. Our public utilities today are maintained on money furnished by many millions of our people, and it is desirable that it should be so. To secure this there should be reasonable assurance to investors of fair earnings. On what? Why, on the investment, on what (under proper conditions) has been put into the public use.

"In this connection the use of the terms 'value' and 'valuation' is unfortunate. It is not value in any ordinary sense that

is being sought, as has often been noticed. The basis for all dealings involving purchase and rate making should be, not actual cost, not reproduction cost, not market value, not stock and bond issue. It should be what has been well called the 'efficient investment,' *i.e.*, the actual amount honestly and prudently invested in the utility, under normal conditions; no more, no less. The 'efficient investment' theory eliminates all consideration of losses due to mismanagement. Those must be charged against stockholders. 'The Company is held to the same standard of honesty and prudence in the management and maintenance as in the original acquisition of its properties.' It takes no account of bad property investments, it eliminates all the objectionable elements that have been urged against the actual cost theory. As it has been stated in a recent case by the Washington Commission, 'It would seem equitable, just and fair that the public should be required to furnish fair, just and reasonable compensation for the reasonable and necessary detriment a utility has suffered by reason of its service to the public.'

"But not only is a fair return on the 'efficient investment' fair and just, its practical advantage is that it is a fixed and not a shifting thing. Reproduction value is as unstable as water. Efficient investment represents, not what the public does for the property of the company, but what the company does for the public. It does not depend on money market, or rates, or market prices of labor or material, or on values created by the public and not by the service. It does not change with hard times, or shifting population, or the fickle and varying judgments of appraisers or courts. It is a certain and fixed amount which is determined for all time. It is only a matter of proper bookkeeping to keep it up so as to show its amount as of any given date. It is a standard, fixed, natural, 'rate base' from which the service flows, and on which all relations between the service and the public should rest. 'The old methods have proven uncertain, indefinite, and unsatisfactory to honest utilities and commissions alike. Their chief use has been to furnish an easy method to conceal inflated values and dubious financial transactions.' A method is needed 'that will eliminate speculation, allow the honest investor to prosper, and destroy the crooked financier.'"

This question of "fair value" will probably be disposed of by the highest courts in a short time; but until so settled it constitutes the chief point of contention which has been created by the changing prices of recent years.

The issues clearly are as follows:

As to Value, we must either accept investment where known, or some split standard of valuation such as that suggested by Charles E. Hughes in the Brooklyn Borough Case which will give a figure closely approximating investment, in the attempt to secure stable valuation, or we must accept prices as of the time of inquiry, which means for the future constantly lowering values and ultimately the wiping out of large investments necessarily made between 1917 and 1921.

As to rate of return, we must either accept the theory that the fair rate is that rate which will permit the utility to secure the capital it needs, and that the rate varies with the money market, or we must fall back on the theory that the fluctuating value of property will give sufficient return for our needs.

Public policy will certainly not permit the increased rate on the arbitrarily increased valuation, hence the acceptance of the varying rate involves the acceptance of investment as the standard of value.

CHAPTER VII

FLUCTUATING PRICES AND ACCOUNTING ALLOWANCES FOR REPLACEMENT

Another series of questions present themselves in connection with the price changes of recent years. If the cost of replacement of property is an operating expense, and it clearly is such, and has been unequivocally recognized as such by the Supreme Court, and if replacements are to be accounted for either by directly charging to operating expenses, or by the creation of reserves for replacement, how shall the difference between the cost of the new unit and the old one which it replaces be accounted for?

If a railroad replaces 100-lb. steel rails which originally cost $36 per ton with rails of the same weight costing $80 per ton, shall it charge $36 or $80 to operating expenses? If the former, shall it charge the $44 to capital? If so, is this capital entitled to its "fair return"? When the rails are next renewed, in eight or ten years, if the renewal is at $32, how shall the capital account be treated?

It must be remembered that "fair return" and "depreciation" or cost of replacement must both be earned.

Assuming 7 per cent as a fair return, and assuming that the experience of the railroad shows ten-year renewal periods for the rail, an investment in 10,000 tons of rails at $36 would affect the total earnings of the property to the extent of $61,200 per year assuming the straight line method of computing the replacement allowance on the original cost of $36 per ton.

If the entire $80 cost of rails were treated as an operating expense, and no change made in the capital account it would be necessary to raise $105,200 per year for return plus replacement. If the capital were increased by $44 per ton, and the replacement allowance established on the basis of the actual cost of the new rails, which would be the only treatment consistent with the increase of capital, it would be necessary to raise $136,000 per year.

If the compound interest method be used instead of the straight line method and compound interest figured at 4 per cent per annum, the figures of the two latter assumptions would change to $91,833 per year and $122,633 per year.

On any basis of computation it costs the rate payer less money to charge the entire cost of the replacement to operating expenses and provide for retiring it at its cost through the reserve for replacement, than it does to compel the utility to capitalize the excess cost and then provide for retiring it.

In the assumed case there is no new property created for the $440,000 of new capital. There is

nothing which could be offered as security for additional stocks or bonds. If this practice is adopted, and utilities are compelled to *add to capital* when replacements in kind are made at a higher price, it follows that they must be compelled to *deduct from capital* when renewal is made at a lower price; capital must be protected through the replacement reserve, which must collect the entire cost of the unit so that the investor may be reimbursed when he diminishes the capital by replacement at a lower cost. This procedure would greatly add to the difficulty and uncertainty of accounting for replacement, a thing which is uncertain enough as it is.

The rate payer and the general public are interested in knowing that there is no doubling of charges through increased operating expenses due to replacement at higher costs, while at the same time increases are made in "fair value" of property either through the building up of capital in the manner suggested or by means of a hypothetical valuation.

If the rate payer be compelled to pay the cost of replacement, as he should be, no increase in the capital accounts should be made that is not represented by actual additions or betterments paid for by the investor. The investor is likewise entitled to full recognition of, and return upon, his entire investment. When part of that investment was made in direct response to the demands of business during the war period it should be treated exactly as pre-war investment is treated, and so long as the property continues to operate should be entitled to its fair return.

The investor is also interested in knowing that no arbitrary rule of accounting for replacements made during a period of high prices will compel him to capitalize part of the cost of operating expenses and increase the amount of outstanding capital on pre-existing property, unless he is permitted to make full provision for retiring this excess capitalization through the accumulation of reserves ample to reimburse him for the entire cost of the property in question; as, if the next replacement is at a lower figure there should be a large enough reserve not only to cover the charge to operating expense, but also enough to retire the excess capital. To compel the capitalizing of the excess cost of replacements practically compels the requiring of reserve accounting and complicates the problem which is already giving evidences of being a thing which will cause much trouble before it is fully controlled.

If accounting for replacement only dealt with a few items, if it were possible to keep itemized actual costs of all renewals and base the accumulation of reserves on these actual costs, and if it were possible to follow through in the accounts year after year the history of each of the individual items, it might be possible to devise accounting rules that would give accurate results. This cannot be done on a large property. Where the raising of reserves for replacements is based wholly on somebody's estimate, and not on the history of actual expenditures, and where whole groups of property and not individual units must necessarily be dealt with, it would seem that the surest way to secure anything ap-

proximating reasonably correct accounting for replacement would be to treat the entire cost of the replacement as an operating expense and not to complicate the book keeping by attempting to charge to capital any part of the excess cost of the new thing over the thing it replaces.

The original investment was in *property,* and the court has held that it is "that property and not the original cost of it" which is under investigation and is being valued. It would appear to be sound to hold that a renewal of ten miles of 100-lb. rails is the thing that is essential to continued railroad service, and that whether the present cost be less or be more than the original cost is wholly immaterial.

Where reserves are required the variation of the amount raised from year to year is wholly within the jurisdiction of the commission, and these variations may properly reflect changes in the price level in order to insure to the consumer the necessary continuity of service.

The discussion in this chapter applies only to the treatment of excess price and does not have any reference to accounting for additions which increase the weight, or capacity to render service. If the renewal be made of 120-lb. rails to replace 100-lb. rails, or of a 10,000-gal. capacity pump to replace one of 7,500-gal. capacity there is in reality an addition to the original property which ought to be provided for out of funds of the investor.

CHAPTER VIII

SUPREME COURT DECISIONS BEARING ON DEPRECIATION

It is not proposed to discuss the technique of accounting methods for Replacement or Depreciation. Certain matters which have a more or less direct bearing on the accounting side of the subject seem not to have been given sufficient prominence in the books or articles on the subject, and only these things will be touched upon.

The most exhaustive discussion of accounting methods and principles appears in the final report of the American Society of Civil Engineers' Committee (*Trans. Am. Soc. C. E.*, Vol. 81, 1917, pp. 1448 to 1479 incl.).

There is a thoroughly excellent treatment of accounting methods in "Principles of Accounting" by Paton and Stevenson (1919) pp. 482 to 527. In "Railroad Accounting" by Wm. E. Hooper (1915), pp. 49 to 51 and 117 and 118 there is a brief discussion of the Interstate Commerce Commission classification as it has a bearing on Depreciation.

"Modern Accounting" by Professor H. R. Hatfield (1910), devotes a chapter (pp. 121 to 143), to

the subject, and gives a bibliography of nine articles or books referring to the subject.

A study of the various articles and books, in chronological order and a careful review of all cases reported in the courts, indicate that, prior to 1900, there was but little general recognition of the important principle that the wearing out of plant constitutes one important element of the cost of production.

The American Society of Civil Engineers' Committee recognizes the propriety of two general methods of accounting for replacement, which they term "Replacement Method" and "Allowance Methods."

The replacement method consists of direct charges to operating expense at the time of renewal of units of property, while the various allowance methods spread the cost of the unit of property over the estimated life of the unit through the establishment of accounting reserves.

As has already been pointed out the main reason if not the sole reason for the adoption of any allowance method is that the ratio between earnings and operating expenses may be held fairly uniform year after year.

The American Society of Civil Engineers' Committee apparently draws the conclusion that the law as laid down by the Supreme Court in the Knoxville case requires the deduction of theoretical computed depreciation from valuation in a rate case. The writer does not agree with this conclusion. While the writer was a member of this Committee and

acquiesced in the report, he holds the view that a correct construction of all of the recent decisions of the Supreme Court will lead to a considerable modification of the statement of the committee. This subject will be discussed more fully later in this chapter.

The Knoxville decision (212 U. S. 1, Jan. 4, 1909) holds that the cost of reproduction must be diminished by "the depreciation which has come from age and use."

In this case the company made an elaborate analysis of the cost of construction and in arriving at the present value of the plant made large deductions on account of depreciation which they divided into two classes "complete depreciation" and "incomplete depreciation."

The company then contended that in fixing upon a reasonable value on which to compute the return *the amounts of complete and incomplete depreciation should be added to the present value of the surviving parts.*

The court properly negatived this contention because the complete depreciation represented parts of the plant that had "actually perished as useful property," while the incomplete depreciation represented admitted "impairment in value" of the remaining parts of the plant.

It had been well established by prior decisions that the owners were entitled to a fair return on the fair value of its property actually devoted to the public use. "The fair value of the property

being used by it for the convenience of the public." (*Smyth vs Ames,* 169 U. S. 466, 1898.)

That eliminates the contention of the Knoxville Water Company as to the "complete depreciation," which had reference to property no longer existing.

The "incomplete depreciation" is disposed of by the statement that it "is the duty of the company 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." Failure to do this results in losses of value which are the fault of the company and must be borne by the company.

In other words the admitted failure of the Knoxville Water Company to maintain its property or provide for replacement resulted in loss of value that ought to be deducted. This was the case at bar, the failure was actually admitted.

This is not an accounting case. It neither approves nor disapproves of any method of accounting. The important point which was settled by the Knoxville case is the *necessity for making provision to offset the wearing out of plant* and the duty of the owner to secure proper rates to permit him to do this.

Previous to the rendering of this decision the Supreme Court had referred to replacement accounting methods first in the Kansas Pacific case in October, 1878, when it was held that "only such expenditures as are actually made can with any propriety be claimed as a deduction from earnings." (*United States vs Kansas Pacific Railway Com-*

pany, 99 U. S. 455.) This in effect prohibited reserves for future replacement.

In *Reagan vs Farmers' Loan and Trust Company,* 154 U. S. p. 362 (1894) it was held that an expenditure of $302,085, described as "cost of road, equipment and permanent improvements" which had been charged to operating expenses was properly so charged. A large part of it was for replacement of rails. The court says, "Now it goes without saying that there is a constant wearing out of rails and a constant necessity for replacing old with new. The purchase of these rails are what is necessary for keeping the road in serviceable condition."

During all the years from the early days of the industry, down to 1909, the Supreme Court only referred to depreciation accounting in these two cases and during the entire time railroads had been charging replacements direct to operating expenses. They have continued to do so. This method is recognized by the Interstate Commerce Commission and is fully authorized by their classification of accounts.

In the Cumberland Telephone case, decided in February, 1909, Justice Peckham delivered the first Supreme Court opinion which squarely approved the creation of reserves:

> "That it was right to raise more money to pay for depreciation than was actually disbursed for the particular year there can be no doubt, for a reserve is necessary in any business of this kind." (*Louisiana Railroad Commission vs Cumberland Telephone and Telegraph Company,* 212, U. S. p. 444, 1909.)

In the Lincoln Gas case Justice Lurton sounds a warning against double charges against consumers:

"If in the past, reconstruction and replacement charges have been met out of current expenses the fact must be taken into consideration, both when we come to estimating future net income and in determining what sum shall be annually set aside to guard against future depreciation. . . . otherwise there will be a double deduction on that account, first, by paying such charges as they occur, and thereafter by a contribution out of the remaining income for the same object. . . . Then the amount to be set aside for future depreciation will depend on the character and probable life of the property *and the method adopted in the past to preserve the property.*" (*Lincoln Gas and Electric Light Company vs City of Lincoln,* 223 U. S. p. 349.) (Italics Ours.)

Here is a clear recognition of the propriety of both methods. No condemnation of either one is to be read into this decision.

The Kansas City Southern case holds:

"The railroad company may, if it sees fit, anticipate general depreciations, and make provision for them by establishing a reserve for that purpose, but if no such provision has been made the abandonments should be taken care of by charging them to present or future operating expense." (*Kansas City Southern vs United States,* 231 U. S. 423, 1913.)

There seems to be no decision of the United States Supreme Court in recent years that limits the accountant as to the details of bookkeeping methods to be adopted. Nor is there anything inconsistent with the view that only *loss of value* in a property, whether due to failure to maintain the property, or

failure to set up the proper accounting reserves, is the thing that shall be deducted. We have up to this time had square decisions on "depreciation" from the Supreme Court, the older ones:

(*a*) Recognizing the propriety of accounting for replacement by either method.

(*b*) Demanding that depreciation in the sense of loss of value shall be deducted.

There is not a paragraph in any of these decisions which can be construed as demanding the deduction of "theoretical depreciation," "accrued service life" or any other arbitrary figure based on a hypothetical comparison of the existing property with an exactly similar new property. Any such comparison results in a figure greatly in excess of the sum of money which the company could find any justification for expending on the property.

The cases decided in the period between December, 1920 and June 1, 1922, go far toward a recognition of the fact that investment may be "maintained intact." Judge Knappen of the United States Court of Appeals, Sixth Circuit, finds in *Nashville, Chattanooga and St. Louis vs United States,* 269 Fed. 351 on Dec. 6, 1920, that it is possible so to maintain a railway that, after making the repairs, renewals and replacements of a year, there has been no depreciation of the railway "as a whole." "Also that it is possible to maintain the roadway, track and structures so that there will be no depreciation if we consider the roadway, track, and structures as a composite whole" also that "the service life of any normally operated and normally

and well maintained railroad is perpetual, and it is maintained in the condition of property serving its purpose by annual renewals and replacements."

Seven days after Judge Knappen's decision the report of Special Master Abraham S. Gilbert in *New York and Queens Gas Company vs Newton* was approved by Judge Myer (269 Fed. 277). This case was subsequently reviewed by the United States Supreme Court and affirmed on March 6, 1922.

This gives the Master's report great weight, to which it is entitled by reason of his experience. He was appointed Master in eight cases: The Consolidated Gas Company, the New York and Queens Gas Company and in six other gas cases. He spent two hundred and eighty-two days in hearings and preparing opinions. The record in the Consolidated case was very large, 20,000 pages; that in the Queens case 2,000 pages and the others ranged from 1,400 to 2,900 pages.

On the subject of Depreciation, the Master held that there was no ascertainable life expectancy on a very large proportion of gas property; that obsolescence occurs when supersession takes place and is a charge on the economies to be realized therefrom; that "the complainant gas company has maintained its property and investment intact in the past through renewals and replacements . . . and no reason appears for believing that it cannot continue to do so," and that no deduction for so-called "accrued depreciation" should be made.

In effect, the Galveston case, decided by Judge

Hutcheson on April 27, 1921 (272 Fed. 147), holds that no depreciation annuity should be computed on overhead costs such as interest during construction, organization expense, law expense, etc., because they are incidental to the creation of the property and "the property will not be constructed again as an entirety, but is to be kept up by annual renewals from time to time made, so that engineering and other such overheads, caused by the assembling of the plant, will not have to be provided against, because they will not again be incurred." This decision further holds that "deferred maintenance" is depreciation and might with propriety be subtracted from the valuation of the property.

Justice Brandeis in reviewing this point, held that the request of the company to be allowed to amortize the amount of the deferred maintenance through an allowance from earnings over a five-year period was "an attempt, in another form, to capitalize alleged past losses; and the request was properly refused both by the master and the court." (See Appendix.)

The obligation stated in the Knoxville case to see "that the value of the property invested is kept unimpaired so that . . . the original investment remains as it was at the beginning" would indicate that the court had clearly in mind the deduction of such losses of value as might have been restored to the property, but which had not been.

The Galveston case makes it clear that what has been called "deferred maintenance" is *depreciation* in the sense of loss of value, that it is the duty of

the company to *maintain,* and if it fails to do so it will be penalized.

The Appendix is a fuller review of the leading and historical court cases bearing on the subject of depreciation. Citations are at considerable length and arranged in chronological order.

CHAPTER IX

DIVERGENT VIEWS AS TO THE PROPRIETY OF ACCOUNTING RESERVES

Prior to the year 1917 there were two apparently irreconcilable groups, one arguing for the creation of large reserves, one contending that such practice was not essential.

The Annual Report of President Theodore N. Vail to the stockholders of the American Telephone and Telegraph Company for the year 1911 presents one set of views as follows:

"While Commissions and all thorough investigators are agreed that provision must be made out of current revenue for depreciation and future replacement of plant, there seems to be some tendency on the part of others to question any accumulation of reserves.

"To make adequate provision for future contingencies it would seem to be plain that in an increasing business there must also be an increasing reserve.

"There seems to be a tendency to insist that 'betterment' of every character shall be represented by capital issue, and that depreciation reserve should be determined with precision, and that it, and all reserves beyond it represent excessive gross charges; that is, gross charges greater than are necessary for the legitimate purposes of the company.

"Reserves are a provision for deterioration and obsolescence of plant beyond that which can be covered by current maintenance

and current replacements, and also for deterioration of assets and for fluctuations in gross and net revenue caused by varied business conditions. If there were an exactly ascertainable condition, with which all practice is in accord, many of the difficulties and differences of opinion connected with this question would disappear.

"If the plant were kept in the highest possible state of efficiency by the expenditure of current revenue for repairs, maintenance and replacements, sufficient to maintain the plant at the highest possible efficiency, it could be operated perpetually and would never have to be replaced. Between this, and maintenance which barely keeps the plant in service, there is a wide margin, and in this margin is the origin of nearly all the differences as to cost of service, and in it is the opportunity to show large apparent profits at the cost of the future of the plant.

"There are, however, in the conduct of business many conditions and possibilities which cannot be met out of current net revenue and should not be met out of capital, but which if not provided for in some way would put all industrial companies upon a speculative basis.

"There is that obsolescence which comes from revolutionary improvements necessitating wholesale replacements of obsolete apparatus or plant, such as the replacement of overhead systems by underground systems, or such as took place when the present method of operating was introduced. There are those fluctuations in net revenue caused by business depression which cannot be overcome by immediate reduction of fixed charges, overhead expenses or operating costs. There is that constant tendency to increase in wages and cost of material, that tendency to increase in operating expenses and capital charges caused by the constant demand for increased efficiency or service, that demand for extensions, productive and unproductive, and that call for improvements in plant, equipment and apparatus. There is that increase in costs of operating, in greater ratio than the increase in business, peculiar to some branches of the telephone service.

"These and many other possibilities always confronting industrial and public service undertakings must be provided for. They are not the subject of capital expenditures, and can only be

provided for by an accumulating surplus and reserves invested in productive plant or securities. If these are not provided for, trouble, if not disaster or destruction, is inevitable.

"Any practice which does not, at the cost of revenue, pass the property on from the present to the future in at least as good a condition as received from the past, is a mistaken practice; it is using capital for the benefit of the present at the expense of the future.

"The main objections urged against an accumulating surplus are the following:

1. That it is provided out of excessive charges to the public for service.

2. That it tends to extravagance of operation, on the theory that close margins tend to greater economies.

3. That it affords a way of giving exorbitant and unreasonable dividends to the shareholders by some form of distribution of the surplus from time to time.

"The answer to the third objection depends somewhat on the treatment and ultimate disposition of the unappropriated surplus reserves.

"If these reserves are to remain as assets of the company, *indivisible, inviolable* and *inalienable* except for the purposes above mentioned, invested in productive property, it removes the strongest and only really tangible objection to surplus of the character herein advocated.

"So far as the American Telephone and Telegraph Company and associated controlled companies are concerned, the third objection can be dismissed with the statement of their policy, which is as follows:

"Except where in the extension of business extraordinary risks are taken which entitle them to some extra profit in consideration of such risks, or the net returns have not been sufficient to make an adequate return, if any, on the capital, the American Telephone and Telegraph Company and associated utilities controlled by it are and will be satisfied with reasonable average returns on their outstanding capital obligations, which, compared with other business investments, should be about 8 per cent, and will not expect or encourage any expectation of more than this; and in

those excepted instances above referred to, they will only ask for that reasonable return which any equitable commission or court would award them.

"As to the second objection. The most important and controlling factors of all charges for service are fixed charges and operating expenses. All public service companies not now, will soon be under government control and regulation, and all charges and expenditures will be under the close scrutiny of these regularly constituted bodies. If this does not protect against extravagance, nothing will.

"In answer to the first objection, the many and marked peculiarities of the telephone and telegraph as distinguished from other public utilities justify ample surplus reserves.

"Any new railroad or plant of local transportation company, gas or electric light mains must be constructed at least of a certain minimum standard or capacity, and as the cost of construction does not increase in nearly the same ratio as the increase in capacity, a large increase of business is always provided for in the building of any new plant. Another important consideration in the size of plant constructed is that in emergencies large overloads can be carried on plants of this character for considerable periods. For these and other reasons, additional capital expenditure is not continuous, seldom, if ever, is imperative, financing arrangements can be definitely anticipated for long periods and adapted to the most favorable conditions and times.

"With the telephone and telegraph, the case is entirely different. Except below relatively small minimum units, the telephone plant is built according to the business that is expected in the immediate future, and the plant necessary for the development of business can be added as needed, and to save charges on idle plant this is done. It is sometimes advantageous to anticipate growth, and it is often but only done *when the saving in construction costs and other advantages more than balance the cost of carrying the idle plant.* There can be no overload in the telephone business, the capacity of the plant must be equal to the peak of the business and to all possible emergencies. Each increase in business calls for an additional telephone circuit and each telephone circuit calls for additional capital expenditure, and under the

requirements of the business all demands for extension of service are imperative and must be met at once.

"This make necessary regular periodical provisions for financing, which must be met regardless of the general business conditions.

"Another and a marked disadvantage of the telephone business as compared with other public services is that the capital expenditure for gas or electric light plant is confined to generating plant and distributing mains; the customer's connection from street to house and the inside house installation are done with the capital and at the cost of the customer.

"With the telephone each additional subscriber calls for capital expenditure from the central office to the house or place of business, and for all interior installation and wiring. This interior installation, representing large expenditure, is a burden not only on the capital but on the net revenue of the telephone, from which other service companies are free. For every one hundred thousand stations gained in 1911, two hundred and seventy-two thousand stations were installed. All the cost of the one hundred and seventy-two thousand, over and above the salvage, which is variable and small at best, is a charge upon revenue, and a general charge on all permanent subscribers, which would not be the case if the interior installation were at the expense of the subscriber.

"All the advantages of an unexpended surplus reserve, which remains invested in an inalienable asset of the company, namely in productive plant, accrue to the public by the reduction of revenue which it is not necessary to earn to meet the capital charges, as the plant which is constructed out of these surplus reserves does not represent capitalization.

"Among the more important advantages to a company of a large surplus represented in the fixed assets are the following:

"It strengthens the company's credit, enabling the company to make its interest and dividend payments uniform and dependable.

"It enables the company on the strength of this credit to obtain its capital requirements on the most favorable terms.

"It enables the company to ride out commercial and financial disturbances which might otherwise cripple or destroy it.

"It enables the company to maintain at all times the highest state of efficiency in its operation, which would be impossible for any company which is obliged to adjust its more or less inflexible operating expenses to the constant and inevitable fluctuations of business.

"It is a reservoir, as it were, which, supplied by a fluctuating stream of gross revenue, enables the company to maintain even and uniform disbursement for service, maintain a uniform operating organization, and that high state of efficiency which can result only from a permanent operating force.

"To reduce rates as fast as any surplus is created, to forbid any application of revenue to the betterment of plant, to insist that new capital shall be provided for such purposes, would never be thought of in any private business and should not in any corporate business, particularly public utilities, subject to other regulation and control than that of actual ownership. In individual or partnership business all revenue beyond stipulated amounts is left in the business, is a reserve, and in addition there is that reserve consisting of the entire assets of the individual. This is the basis of business credits.

"The only sound conclusion that can be reached after full consideration of all the various phases and factors of the problem is, that ample reserves should be provided to meet not only probable happenings but possible happenings, and that such reserves should be so invested that whatever increment or revenue is to be derived from the amounts unexpended or not used for the purposes intended will go to the public in reduction of charges for or in improvement of, service, and that the value of a public utility plant should be represented by a relatively small percentage of outstanding securities calling for fixed charges.

"No expenditure which does not produce increased net revenue should be capitalized.

"Any public service plant which is represented by relatively small outstanding capital obligations is stronger, can better meet its public obligations, and so long as the surplus is inviolable and inalienable as above defined, and the company under government

control and regulation, the greater the ratio of surplus and reserves to plant, the nearer we get to all the supposed advantages of public ownership without any of its risks, while retaining all the advantages of private management."

In 1914 Mr. Vail commented as follows on this subject:

"The policy of the Bell System with respect to depreciation and depreciation reserve has continued on lines that are recognized as sound and reasonable both by investors and by the telephone-using public.

"That policy, briefly stated, is this: Each Bell Company makes charges to its operating expenses for the purpose of creating and maintaining proper and adequate depreciation reserves, and these reserves are used to meet the expense of depreciation.

"The Interstate Commerce Commission defines expense of depreciation as follows:

"(*a*) The losses suffered through the current lessening in value of tangible property from wear and tear (not covered by current repairs).

"(*b*) Obsolescence or inadequacy resulting from age, physical change, or supersession by reason of new inventions and discoveries, changes in popular demand, or public requirements, and

"(*c*) Losses suffered through destruction of property by extraordinary casualties.

"The amount charged by the Bell Companies for depreciation in 1914 was over $41,000,000, of which the amount unused during the year was about $15,000,000. While this $15,000,000 will some day be required for replacement of plant, it does not remain idle in the meantime, but is invested in productive plant, and is thus temporarily employed as additional capital on which no dividends or interest charges have to be paid."

This company has throughout its history consistently followed the policy outlined by Mr. Vail in

the two annual reports which have been quoted in full as far as they refer to this subject.

The following figures taken from the annual reports of the company show the results of this policy:

BELL TELEPHONE SYSTEM IN THE UNITED STATES

Statistics derived from statements of earnings and expenses as published in annual reports 1911 to 1917 inclusive. All duplications excluded.

(1) Year	(2) Gross Earnings	(3) Current Maintenance	(4) Depreciation	(5) Total Net Earnings	(6) Dividends Paid	(7) Surplus
	$	$	$	$	$	$
1910	165,612,881	25,763,082	26,264,927	50,994,408	25,160,786	14,276,758
1911	179,477,998	30,184,522	28,655,832	51,586,297	25,966,876	12,008,561
1912	199,172,154	31,762,636	34,942,802	56,886,690	29,460,215	13,221,110
1913	215,572,822	32,442,979	37,739,991	58,689,523	30,301,705	11,735,194
1914	225,952,123	31,595,388	41,496,240	59,247,279	30,304,186	10,002,452
1915	239,909,649	31,171,272	44,888,702	66,181,757	32,897,065	15,189,049
1916	*264,575,280	34,923,549	49,631,966	†88,669,675	35,160,119	22,078,589
1917	*294,894,950	41,151,041	52,919,458	†90,488,806	36,862,582	13,851,629
Total	1,785,167,857	258,994,469	316,539,918	522,744,435	246,113,534	112,363,342

Accounting changed, Jan. 1, 1916.

* Gross income from operation, not exactly comparable with prior years.

† Total net income, not exactly comparable with prior years.

Reference to the balance sheets shows total reserves, surplus and depreciation of $119,598,526 in 1910 which had increased to $303,525,651 by Dec. 31, 1917.

During this same period the book valuation of telephone plant increased from $610,999,964 to $1,064,892,710. The period of government control in 1918 and 1919 has left the reports for these years such that it is considered advisable to include no figures subsequent to the year 1917.

During the entire period of 8 years from 1910 to 1917 the accumulation for depreciation reserves averaged 17.7 per cent of earnings, or an annual charge of between 4 and 5 per cent of the book value.

Analysis of these figures would appear to indicate that $503,970,604 had been expended in maintenance and replacements from Column 3 and Column 4, and that over $71,500,000 from the depreciation had with the surplus gone to make up the increase of $183,-927,125 of balance sheet surplus.

These figures are given as being perhaps as good an illustration as can be found of the results of modern depreciation accounting and would go to prove that the company is doing exactly what their statements indicate they have set out to do.

From the standpoint of conservative business which secures rates sufficient fully to protect the investor, this is an ideal showing.

There is another group of men who contend that this form of accounting is neither necessary nor especially desirable. Professor Allyn A. Young in a paper entitled "Depreciation and Rate Control"[1] says:

"Moreover, it would now be idle to claim that to require depreciation charges is in no manner to interfere with the financial policy of the railroads. For the compulsory annual additions to the reserve for accrued depreciation decrease by their full amount the apparent profits of the year and thus the amount available for dividends. Although no investment of a separate depreciation fund is required, yet the writing down of the capital

[1] *Quarterly Journal of Economics*, August, 1914.

assets by the amount of the accrued 'depreciation' means in the long run either that other assets have to be larger in amount than they otherwise would have been or that liabilities have to be smaller. Usually the growth of the reserve for accrued depreciation means in practice that additional permanent investments are being made out of earnings. The reserve represents an additional, permanent, and compulsory investment in the business to take the place of the amount of the investment written off for depreciation. To require such a reserve to be created is to control, in that degree, the financial policies of the companies affected. This is not to condemn the requirement in question, but merely to show its real significance.

"But, it may be objected, surely property that is half worn out is not worth as much as when it was new. Should not its value be written down, if the balance sheets are to tell the truth? This question has significance only if it be assumed that the purpose of the depreciation accounts of railroads and other public service companies is to record the *decline in the market value of individual assets.* But even for private business undertakings this is not, in the opinion of the majority of competent writers, the purpose of depreciation accounts. It is most certainly not their purpose in railroad and public utility accounting.

"The balance sheets of public service corporations are not designed, as those of a merchant might be, with primary reference to a possible insolvency. The outlook to be assumed is that of continuous and permanent operation. Many of the parts of a public service property could not be detached and sold except as scrap. And as for the market value of the undertaking as a whole, it is scarcely necessary to say that this is a matter of earning power, which depends upon rates and hence eventually upon the manner in which public control is exercised. It is hardly to be expected that anyone will defend the propriety of a reserve against the possible depreciation of market values resulting from compulsory rate reductions.

"Nor are the depreciation charges on public service properties supposed in any way to represent a diminution of the productive efficiency of the plant and equipment. For with replacements and repairs properly attended to, there is no general decline in

productive efficiency. Even for any individual item among the wasting assets the loss of productive efficiency usually comes as a sharp decline near the end of its period of life rather than a gradual deterioration spread evenly through its years of use.

"The depreciation to be reckoned with in the case of such properties is merely a phase of cost-keeping—a device for allocating the consumption of capital among the successive years. The concrete facts to be recorded as best they may are not the 'using up of values' (whatever that may mean) nor yet anything related to a deterioration in the service rendered, but merely the actual expiration of part of the aggregate probable period of use of the instruments of production on hand, and the nearer approach of the time when they will have to be replaced.

"Profits and interest, it is very certain, cannot be counted until the principal of an investment is replaced or provision is made for its replacement. In the case of a business where one item forms the bulk of the income-yielding assets—a steamship, a coal mine, a patent right purchased at a price, for example—either enough must be set aside out of annual earnings to replace the original cost of the property when it is abandoned or retired, or the proprietors must be content to consider that their investment is being returned to them in instalments. If the business is to be continued on the same scale the replacement must, of course, be provided for in advance or else the proprietors must make a second investment equal in amount to the first.

"All this is elementary. It is brought into the present discussion merely to indicate clearly the conditions under which a reserve for accrued depreciation is well-nigh indispensable. But where a property is varied and no single wasting asset or group of such assets is of dominating importance the case has been shown to be different. The periods of use of the different items of assets *overlap,* so that when depreciation is charged from the beginning on each item, a reserve begins to accrue on a given item before the reserves accumulated on account of other items have been diminished on account of replacements. The permanent reserve thus created is not needed. Nothing corresponding to it appears in the simpler case where depreciation is registered on some large asset representing the major part of the

investment. It is very likely that some of its defenders fail to distinguish between depreciation charges to provide for replacement and depreciation to provide for liquidation—i.e., to maintain market value.

"The fallacy in the view that the 'reserve for accrued depreciation' is a necessary record of fact hinges on what is from the economic point of view the more or less accidental circumstance that the productive equipment of an undertaking happens to be in units of a sort that *are defined as units by the customary categories of purchase and sale.* In economic fact the property of a public service undertaking as a whole is a productive unit. Consider it as such—then replacements appear merely as repairs necessary to keep the whole property in a state of efficiency. Repairs in this large sense are of course to be counted as operating expenses, as is true of minor repairs. But if such repairs are fairly regular in amount year by year there appears to be no inexorable reason why a fund to provide for them should be accumulated in advance and more especially a fund that will amount to much more than the actual annual cost of the repairs. . . ."

"In general, there is a reasonable presumption that the investments in undertakings which have not accumulated a depreciation reserve were not made with the expectation that it would be necessary to charge depreciation accruals to operating expenses. It follows that it cannot in general be presumed that the profits of such undertakings have contained an element which should unquestionably be considered a repayment of part of the invested principal. Accordingly, serious objection might properly be made to a system of compulsory accounts which requires that property already on hand be written down for depreciation.

"The control of accounting with respect to property acquired after the new system of accounts is introduced is quite another matter. These subsequent investments (including replacements) are made with full knowledge of the accounting rules in force and of the way in which 'profits' are to be defined and measured. Whether a 'reserve for accrued depreciation' should be required for such property is purely a matter of public policy. They are not necessary to the continued and successful operation of the

property. But there are several points in their favor. Such inequalities as occur in the replacement needs of successive years can be met with less shock. Annual profits tend to remain steadier when variations in replacements are largely absorbed by the variation of corresponding charges to the depreciation account rather than being directly charged to current operating expenses. And in the case of possible purchase at some future time by the government the existence of adequate reserves against all accrued depreciation would greatly simplify the problem of valuation for sale, just as it would eliminate some of the difficulties that now attend the problem of valuation of rate control."

Robert A. Carter and William L. Ransom in 1921, made a clear statement of the case in connection with a discussion of the reserves of Class I railways and of the New York Telephone Company:

"Whether the rates charged by the telephone company or by the railway carriers are or were reasonable or excessive, we do not undertake to say. That question is for the regulatory commissions charged with the duty of seeing to it that such rates are kept neither too high nor too low. Our comments are only upon a system of accruals through charges to operating expenses on the basis of theoretical estimates, which leads to the collection of sums so greatly in excess of the actual retirement expense over a representative period. Whether the rates actually charged yielded more than a fair return over and above actual operating expenses, we do not here discuss. Any sums collected in excess of actual operating costs, including the actual retirement expenses (averaged, if desired, over a representative period) should be collected as return on investment or not at all. No carrier or utility should be permitted to collect from its patrons more than its operating expenses plus a fair return, and no carrier or utility should be permitted to make its return from existing rates *appear* inadequate through charging to *operating expenses* a sum whose accrual is not required by any actual outlays of the company, either current or prospective. No implication is intended to be

conveyed against the policy of making reserves, out of the fair return, for contingencies, if it is deemed advisable to thus segregate a part of the surplus earnings. There should be left, however, no room for doubt that when thus segregated such a reserve still represents surplus earnings belonging to the stockholders and that upon the property in which it is invested the company has as unquestionable a right to earn a fair return as it has upon the property representing its surplus so called."

That courts are beginning to take notice of the fact that the creation of reserves may have to be restricted, is evident from some of the later cases. This subject is discussed in *Pioneer Telephone and Telegraph Company vs State,* an Oklahoma case, by the Supreme Court of that state in September, 1917. This case is reported in 167 Pac. 995. In the decision Judge Kane expressed the views of the court as follows:

"From our investigation of the problem of depreciation we are convinced that precedent on this question is varying, and that there is also great contrariety of opinion among the heads of public service corporations themselves, some companies believing that their best interests lie in adopting the largest possible depreciation charge and in the consequent accumulation of a permanent fund in the future, whilst others contend that the application of the doctrine amounts to a virtual confiscation of their property. Without attempting to set out herein our analysis of these discordant views, it is sufficient to say that we have reached the conclusion that in plants of considerable size that have attained their gait, to which class the plant herein is conceded to belong, there is both theoretically and actually a normal condition in which the replacements come along with comparative evenness, and where there can be no possible use for a so-called depreciation fund of any considerable amount."

"There is no principle of public regulation more firmly estab-

lished than the right of the company to charge in its rate an amount which will enable it to make these replacements, and as investors put their money into public utilities for the sake of the returns they will be able to obtain, if the allowance for replacements is sufficient to keep up a high degree of efficiency and prevent a lowering of the ability of the plant to earn returns, we are unable to perceive the necessity for building up a fund to be used for the purpose of counteracting a purely theoretical depreciation. The theory of the Commission seems to be that charges should be made in rates sufficient to counteract or prevent depreciation by replacements, and that when replacements are thus fully provided for, depreciation is counteracted."

The presentation of these opposing views has been quoted at considerable length on account of the clarity of the arguments presented and the extremely high standing of the men making them.

It should be emphasized that there is great divergence of opinion on this particular subject, that it is so possible to administer depreciation reserve accounting as to be wholly in the interest of the owner and as to work a great hardship or injustice to the consumer, and that it is a subject which may cause a vast amount of difficult and delicate work for regulating commissions in the future if methods are approved now which later may need to be revised in the interest of the consumer or rate payer.

CHAPTER X

THE UNCERTAIN CHARACTER OF DEPRECIATION ESTIMATES

WHENEVER it becomes necessary to make allowances for replacement and to create reserves for replacement it becomes necessary for someone to make estimates of the annual decretion or loss of service life of the property, over and beyond replacements charged to operating expenses during the year.

Too much stress cannot be laid upon the uncertain and approximate character of all such estimates.

It is fair to assume that in every case the accountants will make use of the best information available on which to base judgment, but there are many factors which enter to complicate the estimates.

The size of the property has much to do with the extent of detail which can be undertaken in accounting. On a comparatively small property, especially where there is not rapid expansion, it may be entirely practicable to use an amount of detail which would not be possible on a large property covering a great area of country or doing business in a large city, in several cities or in more than one state.

The size and character of the accounting organization has a decided influence on accuracy of detail. Where the property is such that a few people who have a familiarity with the physical property are the only ones who handle the accounts, the results are likely to be very different from those secured by an organization with several hundred employees, possibly in several offices, in different localities, all of whom are called upon to do some part of the work. Changing personnel, lack of familiarity with the physical details of the plant, dependence on the opinion of men not familiar with the accounting methods employed, all are things to be reckoned with.

This subject is discussed by Hooper in "Railroad Accounting" (1915) as follows:

"There are two other important things which must be allowed for in considering the cost of upkeep of the plant. These are depreciation and the treatment of abandonment of property. If a factory building is subjected to wear and tear of machinery that will, in the course of a certain number of years, entirely destroy it, regardless of the fact that repairs are made during these years, there is an item of expense going on in each one of these years that is not being covered by the charges for repairs. If at the end of the series of years the building is replaced with a new building, the charge for this replacement is not an additional investment in property but is an expense of doing business. If, however, the entire cost of replacing the building is charged to the expenses of the single year in which the replacement takes place, in theory at least an undue charge is made against the revenues of that particular year. The deterioration of the building has taken place in each year during the series. It is in recognition of this fact that industrial companies make a certain charge each year in addition to expenses for what is called depre-

ciation. Depreciation on a factory building is comparatively easy to figure, but when one tries to figure depreciation on such a highly complicated plant as that used by a railroad company in the manufacture of transportation, the task becomes well-nigh impossible. Even if it were possible to have a list of every class of material that forms part of the permanent way and structures of a railroad, and from long observation to be able to tell with a fair degree of accuracy what the life of each class of material was, the rates of depreciation would be so varied, not only as between different classes of material but as between the same materials used under different service and weather conditions, that any rate for the whole plant would be hopelessly wide of the facts. The same would be true for any unit selected, as, for instance, road mile or track mile. The Interstate Commerce Commission permits railroad companies to charge as part of expenses depreciation on roadway and structures if they so desire, but makes no suggestions as to how this depreciation shall be figured."

"An arbitrary charge of this kind is worse than no charge at all, because one of the greatest benefits resulting from the exercise of the power of the commission to prescribe accounts has been the uniformity that has necessarily been adopted in keeping the accounts. A charge for depreciation is in the nature of a 'guess' at the life of equipment and 'guessing' is not the province of an accountant."

"The management of a railroad company is very human. There is no scientific basis on which a roadmaster can certify to the management the exact day, month, or even year in which a tie or a rail needs renewal; the same is true as to ballast and other material. There is no scientific rule by which a man can tell when he needs a new suit. If he is making money he decides that his old suit can't possibly be used for another season and he orders a new one; if he is in hard luck, the old suit is plenty good enough for another season. Railroads are run on much the same basis. Cars and locomotives can be kept in service for a long time if the road cannot afford to replace them. In other words, the commission's system of accounts does not prevent a management from either starving or fattening up the property."

The more one investigates accounting discussions of this subject the more completely one is convinced of its difficulties and complexities and of the fact that only men of long experience in accounting and possessing an exceptional acquaintance with the property and knowledge of its various parts ought to be in charge of this work.

When faced with the task of making an estimate of the actual depreciation or loss of value which has accrued in a property, which should be deducted on account of failure of the owners to "maintain the investment intact," the engineer is compelled to resort to some form of computation on which to base his estimate.

In the same way the accountant must adopt some basis for the determination of that allowance which he will make to offset the wear and tear, obsolescence and decay of the current year which cannot be made good by replacement of parts.

Naturally both engineer and accountant have turned to the average life of certain classes of property as one method which appears to be reasonable. In the case of the life insurance companies tables have been prepared giving the expectancy of human life. These tables are based on the experience of many years, and rest on vital statistics which have been carefully kept. They deal with hundreds of thousands or perhaps millions of individuals. These tables, supplemented by a most careful physical examination of the individual, form a basis for an estimate of remaining life. In referring to this illustration it must be remembered that each human

unit is given a medical examination that is much more thorough than the engineering examination which is ever given to physical property by either engineer or accountant.

The engineer and the accountant have the benefit of no such statistics or no such life tables applying to property as are the insurance companies' human life tables. Certain units of property are not greatly subject to wear and tear, but reach the end of their usefulness on account of decay. Some kinds of timber under given conditions may have a fairly determinable life. For example, a railroad forty or fifty years old may have reasonably dependable records of the average life of ties or of bridge or trestle timber so that these records may form a good basis for estimating.

If all available statistics as to locomotives were to be collected and analyzed it is quite possible that some definite conclusions could be drawn. This class of property is made up of large units whose cost is known, and frequently, perhaps generally, individual records are kept with each locomotive, showing the cost of each repairing and major overhauling. There are few kinds of physical property of which this is true.

Some kinds of property have a life which is not properly measureable in years. The rail on the main line of a heavy traffic road wears out and its life is measurable in terms of the number of locomotive miles or ton miles passing over it. Rail of the same weight and chemical composition will have a life of two or three years on one road, twenty

years on another and an indefinite life on another, depending on the amount of traffic carried. In this case, like that of the ties, a careful study of renewals over a period of many years is likely to furnish a fair basis for computation on the particular property under investigation, provided records have been kept and provided an intelligent study and analysis is made of those records.

Another class of property may have its life dependent on extent and character of use and extent and character of maintenance, neither decay nor wear and tear being the important factor. Buildings may be taken as an example. Maintenance may be such as practically to eliminate decay, the wear and tear may or may not have a great effect, but obsolescence may affect one unit and not another. Three railroad stations, built in the same year, of the same design, in cities of about 8,000 population need not have identical life.

One is destroyed by fire within a year, one is built in a city which shows 200 per cent increase of population in a decade and becomes inadequate in eight or ten years, the third is in a city which shows practically no growth in forty years and at the end of that time completely meets the requirements for which it was built.

In the case of such buildings as office buildings or hotels, the change of a city district from retail to wholesale, the shifting of business to a different locality or other like cause, may have a disastrous effect on value by creating obsolescence in the building even though its physical condition be excellent.

There are no dependable life tables covering such things as rail, iron pipe, buildings, boilers, machinery, and the hundreds of kinds of items which will be found on a large property. Practically all of the so-called life tables of this kind are made up by some group of engineers and represent the experience or judgment of the members of the group. They are not based on the average experience with hundreds of items. The figures in the tables may represent actual experience in only a few cases. They may represent the judgment of an engineer based on his own practice, observation or memory. Some such tables are entitled to consideration as being conscientiously made, but at the best they are wholly improper for general use.

It is not contended that elapsed life, or probable total life under the conditions which exist on the property under investigation should not be considered when the engineer or accountant is engaged in an estimate of depreciation. As aids to judgment, properly used, and based on a study of operating statistics and actual experience on that particular property they may be of value.

No general use of life tables, especially by inexperienced men, should ever be permitted. General life tables are unreliable because:

(*a*) They are not *life tables.* They are estimates based on a very limited number of cases.

(*b*) The character and extent of the use of a property affects its life.

(*c*) The quality and extent of maintenance greatly affects the life of property units.

(*d*) The element of obsolescence cannot be tabulated. In general it may be said that property in the small and slowly growing city may be affected little or not at all by obsolescence while similar property in a large city especially one that is growing rapidly and making constantly larger demands for the product will have to contend with large losses through obsolescence. It must be remembered that obsolescence constitutes one of the principal reasons for making replacements, but that the cost of such replacements should be a burden on future rate payers who derive the benefit from the more economical unit and not on present rate payers.

Too much stress cannot be laid upon the necessity for thorough study of the operating statistics of the property under investigation. An accounting estimate for the purpose of setting up an allowance to be charged to operating expenses each year to offset diminution in value from all causes, is frankly an estimate. It does not and cannot in the nature of things be anything more than opinion, based on evidence of more or less value. This opinion should take into account the statistics of operation of the property in past years, the judgment of operating officials and employees as to the parts of the property under their control, consideration of elapsed life, conditions under which parts of the property are operating, and everything else that will lead to a reasonably correct figure. General life tables are likely to give results that are far from the truth. There is no reason why, on each property, a study of past renewals of certain classes of units may not

disclose facts which will establish reasonably definite life periods, for certain parts of the property. The use of such information as a basis of accountants' estimates is thoroughly proper.

It is to be regretted that more actual information as to actual life and wear of different kinds of property under different conditions has not been made available. As it is, so-called life tables are often productive of harm rather than good and their use in computing a figure to be deducted from value or investment is little short of a crime.

It is a beautiful theory to assume that as parts of a property are built and new units replace old ones, the useful life of each unit will be determined, its scrap value and cost set up in the books, and some method adopted for setting aside a reserve which will at the end of its life accumulate sufficient money to retire that particular thing.

In the case of locomotives, passenger equipment, and other property of such distinctive character that individual records may be kept, or in the case of large single units, such as the waterworks equipment, reservoir or filtration plant, the bridge of great cost, or the railway terminal, it may be entirely practicable to so handle the accounting as to create reserves to cover the individual unit, or to use that computation as one of the factors in determining the proper allowance for the entire property.

The abandonment of an electric power house or other operating unit of a large property will undoubtedly cause the retirement of hundreds of items

which are far from ready for replacement, many indeed may be entirely new.

The theory fails in the case of such property as a railroad track structure, a telephone or telegraph line, a street railway, an electric light and power or a gas property, or other large operating plants composed of thousands of different kinds of units, of different cost and different expectations of life.

Once, in a discussion of this subject, one well-known engineer told the writer that he would keep individual accounts with every item, even considering the single railroad tie as an item. Such multiplication of detail would be costly and confusing and would defeat the very thing that was sought for.

Illustrations might be multiplied indefinitely which prove the extremely uncertain character of estimates for depreciation.

A study of the history of maintenance, renewals, life of items in various groups or parts of the property or on the property as a whole will, in the case of most operating concerns, disclose some reasonably definite basis for computation of reserves where it is necessary to use them. This may be life in years based on a study of the property. It may be an allowance per car mile, per kilowatt hour, per million gallons of water or per thousand feet of gas. It may be a percentage of gross earnings, or a percentage of total investment in certain groups of property, or it may be that some other method will give the best result.

The fact may just as well be faced that the detailed estimate of probable life, scrap value, and

depreciable value, computed item by item, is not used and not capable of being used on any large percentage of the great properties in the United States. No matter how good the arguments may be for the straight line method, the compound interest method or the unit cost method; no matter how persuasive the diagrams and curves showing that value diminishes largely in the first year; or in uniform amounts each year; or runs like Niagara with a slight fall each year until it nears its end and plunges over the cataract to zero value in a few months; it must be remembered that the great majority of accountants do not arrive at the annual accruals for reserves in any such way. They use their best judgment as to the amount to set up each year, in the effort to set up enough money fully to meet the requirements and provide for all necessary replacements as they fall due.

The problem is to keep the property intact. No one can deny the fact that progress toward replacement is always going on and that to charge simply current repairs to operating expenses is not enough in the case of the great waterworks pump or other machine or structure of long life and great cost, where there are but a few such units.

No one can deny that the wearing out of property, over and beyond current repairs is an extremely difficult thing to compute with any degree of accuracy, but it must be computed in the best way possible if "property is to be kept intact and investment is to be kept as it was in the beginning," on such properties as cannot be kept to maximum operating

efficiency through charges of replacements to operating expenses.

The Knoxville case warns the corporation to get this money, and to get enough, or "the fault will be its own."

The Kansas City Southern case permits the company either to create reserves or to charge direct to operating expense.

The Lincoln Gas case warns not to get too much, not to collect twice, once by direct charges to operating expenses and again by creating a reserve.

If the property is earning large returns it is to the interest of the owners to make the amount set aside for replacement or depreciation as great as possible and to the interest of the consumer to make it as small as possible, therefore the subject constitutes a major issue in every case. It may well be that such abuses as have occurred, such as the establishment of excessive reserves, are the direct and logical result of the war on values which has been waged by many public officials and the attempts of experts in "Depreciation" to deny a fair return through excessive deductions from investment in property.

In actual practice one company sets aside 20 per cent of its gross earnings for maintenance and depreciation, another uses 2½ to 3 per cent per year on the total depreciable property, another uses ten cents per car mile, another seven cents per thousand feet of gas sold, while a fifth uses most elaborate depreciation accounting based on life and age of units; which one is correct?

It may be that in the light of experience on each particular property each one has made a reasonably correct estimate, yet none of these methods can be accepted as proper for indiscriminate general use.

The more free from infinite detail the accounting is kept the better it is likely to be, for depreciation accounting is not a recording of absolute facts, but of guess, estimate, or judgment, as we may please to call it, as to the proper amount of money that will be needed to do certain things that may have to be done much sooner or much later than the time which we in our best judgment fixed as the probable date of replacement.

CHAPTER XI

DEPRECIATION—LOSS OF VALUE WHICH SHOULD BE DEDUCTED

There is perhaps no subject connected with the entire field of utility valuation and regulation which is more difficult to handle, or regarding which a wider range of opinions has been expressed by courts, commissions and engineers than this question of the determination of the proper figure to deduct when making an appraisal for use as a basis of ratemaking.

There can be no argument at all about the fact that everything built by man does actually depreciate. It either wears out or decays, or it may lose all its money value through becoming obsolete or inadequate.

One difficulty comes in determining just exactly what construction is to be placed on the statements of the United States Supreme Court in certain of its decisions, in squaring different statements in the same decision with one another, and in reconciling various decisions, and, after these things have been done, in arriving at some rational plan for computing the amount of deductable loss.

One other hard thing to do is to keep clear the difference between property which is privately owned in relatively small single units, and property in the form of *one great composite instrument of service* made up of hundreds of thousands of units of many different kinds, *one property,* operating under a franchise and under obligation to do certain things.

The writer is fully convinced that a great deal of the work of valuation that has been done in the past has been done without proper conception of the property as being one whole, of continuing life, and much of it has been done on a very erroneous conception of the meaning really intended by the courts in some of their decisions. Then too, much of it has been undertaken in a partisan spirit, and arguments have been adduced and figures presented which have not only not clarified the issues, but have confused them, and have possibly caused the courts to use terms which failed to convey exact shades of meaning intended.

The attempt is here made to show that the decisions of the courts are not inconsistent.

The Supreme Court squarely holds to the concepts:

(*a*) That the duty rests upon the company to maintain its property, through ordinary repairs and maintenance and through renewals of parts of the property, so that its value shall not depreciate and so that the investment in the property "shall be maintained as it was in the beginning." (Knoxville case, 212 U. S. 1.)

(*b*) Apparently in direct conflict with the above are the statements that the estimate of cost of reproduction would give incorrect results if "not diminished by the depreciation which has come from age and use." (Knoxville case, 212 U. S. 1.)

The Knoxville case has already been discussed and it has been shown that the company admitted two kinds of depreciation but claimed that not only existing depreciation in the property in use, but also the depreciation of long ago in the form of property that had ceased to exist, should be added to the present value of useful property.

The decision, it seems to the writer, is capable of only one interpretation and that is that *actual depreciation which amounts to loss of value of the investment shall be deducted.* Justice Moody sums up this concept in the last paragraph of the decision as follows:

> "If however a company fails to perform this plain duty and to exact sufficient returns to keep the investment unimpaired, whether this is the result of unwarranted dividends upon over issues of securities, or of omission to exact a proper price for the output, the fault is its own."

No subsequent decision of the court changes this interpretation in the least. The Minnesota rate cases state, "The Master allowed the cost of reproduction new without deduction for depreciation. *It was not denied that there was depreciation in fact.*" In this respect the presentation of the case is similar to that of the Knoxville case. The decision further says:

"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.*" (Minnesota Rate cases, 230 U. S. 352.) (Italics ours.)

It is well known to every manager of property and to every engineer who has been engaged upon the work of valuation that on all large properties of every kind the inventory which is made of all property owned by the company will include buildings or machines still in existence, which have ceased to perform the function they were originally built for, and have been replaced by new property but which are still in place, sometimes connected up and capable of service, sometimes used in a new form of service of less importance, and sometimes merely awaiting a purchaser. The writer could cite dozens, perhaps hundreds, of illustrations of such cases, in nearly all of which the unit either called for classification as unused property, or for a low valuation on the ground that the new service did not justify any such investment. Practically every property has a number of such cases. The writer does not see in this case any support of theoretical depreciation, so called, or estimated elapsed life, as a proper figure to be deducted in finding a rate base.

The Kansas City Southern case was an accounting case dealing with property which was aban-

doned. The court says, "The real question is not how original cost shall be ascertained but how shall subsequent depreciation in value be reckoned and accounted for." The case was one of complete depreciation, property ceasing to exist:

"Except for the contention (already disposed of) that the value of the abandoned parcels should be permanently carried in the property account as part of the cost of progress, it is and must be conceded that sooner or later it must be charged against the operating revenue, either past or future, if the integrity of the property accounts is to be maintained; and it becomes a question of policy whether it should be charged *in solido* to profit and loss (an account presumptively representative of past accumulations) or to the operating accounts of the present and future. If abandoned property is not charged off in one way or the other it remains as a permanent inflation of the property accounts, and tends to produce, directly or indirectly, a declaration of dividends out of capital." (*Kansas City Southern vs United States,* 231 U. S. 423.)

The Supreme Court consistently holds that the property accounts shall truly reflect the facts. If property is added, the capital account is to be increased; if property disappears, the capital account shall be diminished. The duty of the company is always to maintain investment, but if they fail to charge enough in rates to permit them to do so, or charging enough pay it out improperly, and do not maintain the property, the depreciation which amounts to loss of value is to be deducted in the determination of capital entitled to a return. The test must be this, has the property actually been maintained to the maximum standard? The writer fails to see anything in any of these decisions that

can be construed into a demand that anything more shall be deducted than actual loss of value. Presumably such loss of value is meant as can be put back into the property, or such loss as is due to property units ceasing to be a part of the operating property engaged in rendering the service. The obligation to keep "as it was in the beginning" effectually closes the door on any such theory as the one that would deduct an amount from existing used and useful property which never can be put back.

In practically every valuation that has been made during the past twenty years the engineers doing the work have made an estimate of depreciation. Absolute candor compels the admission that a large amount of this work has been pure guess work based either upon so-called inspection or upon arbitrary use of life tables. Much of this estimating has been done without regard to accounting methods used by the company or without knowledge as to whether or not the company had in the past kept depreciation accounts or had charged replacements to operating expenses.

It is true that there have been a number of really fine studies of the subject of depreciation estimating, and much of this part of the valuation work that has been done has had real merit, but on the whole the work done in recent years has not shown the progress which might have been expected. As the writer has come into contact with this class of work, he feels that a number of criticisms are generally applicable to it.

(*a*) There has been a complete failure to consider the entire property as one operating property, one composite whole, built and maintained for service. Rather the attempt has been to appraise it as a collection of individual items, each considered alone without reference to the number of such items, the method of their maintenance or renewal, or the accounting system used.

(*b*) There has been a general acceptance of the life conception of accrued depreciation. That is, if the assumption is made that a thing has a total life of ten years, and it has lasted five years, it is therefore in 50 per cent condition and the 50 per cent has been deducted.

(*c*) There has been an almost complete failure to consider the amount of money that it would be economically wise and proper to expend on a property at the time of investigation to restore the property as a whole to the maximum condition that might be hoped for, or to such condition as it would be reasonable or justifiable to put it into in order to fully meet all demands upon it.

(*d*) There has been a constant use of the hypothetical "new property" as a standard of comparison, and not of the maximum operating condition, or normal property which is obtained by investment. The "new property," absolutely new in all its parts, is a myth, unattainable in any case of a large organization, and a thing that is of no value could it be obtained because it could not be kept new. No one ever sought a new property. The maximum which can be secured and kept is the operating property

with parts of it in all stages of life, whose average condition of expired life may be 75, 80, 85 per cent or some other percentage condition *which can be maintained practically constant* by current repairs and replacements made when economically due. The first and last of these criticisms have been quite fully considered in earlier chapters. The second and third will be discussed more fully, with illustrations, to bring out if possible the facts which ought to be disclosed.

Much of the valuation work of the past has been based on the theory that every one of the many individual items of which a railroad or other property is made up has an average expectation of life which can be estimated, and a definite age which can be determined, and that this age, or elapsed portion of the total life constitutes the depreciation or "accrued depreciation." This theory is plausible and has won many advocates. Here is an automobile. It is four years old. The average life of a large number of similar machines whose history is of record was actually five years. Therefore this automobile is certainly worth but a small fraction of its original value.

The automobile, one complete unit of transportation, of short life, and the only one, or one of only two or three belonging to its owner, is not comparable to a railroad of several hundred miles nor is it comparable to any one of the individual items owned by the railroad, or to one of the automobiles owned by an electric power company. The single privately owned automobile is capital investment

in transportation property and its wearing out is depletion of capital, the utility owned automobile is consumable supplies, the wearing out of it is a legitimate part of the operating expenses of the company.

One of the best illustrations of this that can be considered is *railroad track,* made up of rails, ties, track fastenings, special work and labor.

Long before anyone thought of valuation or depreciation, the railroads in establishing their systems of accounting made certain obvious groupings of material or labor into separate accounts such as rails, ties, ballast, track and roadway labor, grading and other accounts. This was purely a matter of convenience. Engineers in estimating new work used the same groupings, and it followed as a perfectly natural consequence that when valuation work was first done the same groupings were adopted. This was proper as a matter of convenience, ease and accuracy in accounting, estimating or valuation, but it does not justify the assumption that these accounts represent units of property. The individual tie or the single rail or the single spike is no more a proper unit than the single shingle or the single pane of glass in a residence. The tie decays to such a point that it ceases to serve, the rail breaks and a replacement becomes at once economically necessary. The great railroad running its many trains over the track is neither decreased in value by the condition of the tie previous to the time of its removal nor is it increased in value by the replacement. The smallest unit of

use that can possibly be considered is the *track.* The entire roadbed and track with all of the auxiliary track structures is more nearly a unit because of the impossibility of separating the maintenance costs incurred in keeping up the cuts and embankments, the ballast, the track, the fences and other parts of the roadway structure. This maintenance is all done by the same forces, and the nature of the work is such that it is impossible to determine the exact cost of maintaining the ties, or the rail, or any of the other parts of the roadway structure, the materials of which are assigned to separate accounts.

The track must be kept in normal condition for operation, in the best possible condition that can be maintained, hence the ties and the rails are replaced at the first moment when their condition warrants the change and the expense becomes justifiable. The whole operation is comparable to burning of coal in the locomotive. A tender is filled with coal, it is gradually used up until a point is reached where the tender must be refilled. The burning of coal is no more essential to the operation of the railroad than the consuming of the tie.

In just the same way the residence must be maintained by the replacement of the shingle when it causes a leak or the pane of glass when it breaks. If the residence is maintained, kept painted, and all renewals made when due, the question of value is not arrived at by fixing the hypothetical life of the shingles, glass, nails and other material entering its construction. The residence as a whole property

and the railroad track as a whole property are the fundamental units.

Actually valuation engineers have concerned themselves with the ties and the rail and have in most cases made deductions from value based on comparing with the hypothetical new tie or rail.

The writer had before him one of the valuations of the Interstate Commerce Commission of one of the small railroads of the country.

Account 8, Ties, shows a reproduction of $748,190 and a reproduction less depreciation or fair value of $374,095; in other words, a deduction of 50 per cent for depreciation of ties. Applying the same rate of depreciation per mile as is applied to this little road to all of the railroad mileage in the United States the resultant figure shows a deduction of at least $350,000,000 from the value of the railroad properties on the item of ties alone, a figure of sufficient magnitude to compel a most careful study.

This particular railroad is over forty years old. In the last twenty-five years its main line mileage has not changed over a quarter of a mile. The writer was its Chief Engineer during the years 1890–1896, and has been familiar with it ever since. The ties are certainly in no worse condition today than thirty-two years ago. In fact, they are better because the ton-miles per mile of road in 1915 (the year of the valuation) were 935,000 as against 410,000 in 1892. The writer knows of his own personal knowledge that the quality of maintenance is better now than it was in the early nineties. The

query is: what is this "depreciation"? When did it accrue?

The computation is about as follows: A railroad system has ties to the average number of approximately 2,800 per mile. The life is found to be or is assumed to be, let us say, ten years. There would be on an average mile, in the autumn after all renewals are made for the year:

280	ties	with	an	expectancy	of life of	10 years	2,800 tie years
280	"	"	"	"	9	"	2,520 "
280	"	"	"	"	8	"	2,240 "
280	"	"	"	"	7	"	1,960 "
280	"	"	"	"	6	"	1,680 "
280	"	"	"	"	5	"	1,400 "
280	"	"	"	"	4	"	1,220 "
280	"	"	"	"	3	"	840 "
280	"	"	"	"	2	"	560 "
280	"	"	"	"	1	"	280 "
2,800							15,400 "

The condition, after making the year's renewals would therefore represent 55 per cent of the total tie-years of life in the hypothetical "new property," which would of course have 2,800 ties with full ten-year life or 28,000. In the spring before any renewals are made the *minimum* condition would be 12,600 tie-years remaining or an average condition of 45 per cent. It is therefore assumed that an all-year average condition of 50 per cent will about state the fact. This is then called *depreciation* and in hundreds of cases *this amount has been deducted from the total value assigned to the ties.*

The American Society of Civil Engineers' Com-

mittee has used the term *Decretion,* loss of service life, as a more appropriate term to apply to this condition of age or progress toward the necessity for replacement. This is exactly descriptive of what it is. There is undoubtedly such an element of decretion in all property that has been in use. The writer makes no attempt to argue it away. Some good engineers have been puzzled by it. They have recognized its inevitable presence, they know that it is absolutely impossible to possess a property of any kind that has not a large element of decretion that can be computed, and they know that it is not *loss of value.*

If we refer to the illustration given, an average mile of ties, and if we assume that all renewals in the past have been made when due so that the table represents a true condition at the end of the year, it is evident that the total decretion during the year is 2,800 ties, each losing one year of life, or 2,800 tie-years of decretion. Replacements are made of 280 ties each with ten years' expectation, or 2,800 tie-years, hence the *replacements exactly equal the decretion and there is consequently no depreciation* during the year.

It must not be forgotten that this assumption is based upon complete maintenance to economic maximum condition. When that is not done there is clearly depreciation, loss of value, to just the extent of the failure to maintain.

If, to continue the illustration, the mile in question for four years past had only 60 per cent of the proper number of new ties, and only 186 ties per

year had been put in instead of 280, there would be a *depreciation* of 4,480 tie-years or 16 per cent. This is really depreciation, measurable in the dollars that would have to be expended to restore the property to its normal condition and to replace every tie that the company would be economically justified in replacing.

In other words, as the writer views the problem, decretion while admittedly existing, calls for the expenditure of no money, indeed no one could find any economic justification for the expenditure of money to replace non-obsolete property merely because of decretion. Depreciation is a dropping below the standard of maximum condition, it means either failure to make needed current repairs or it means past due replacements and when the investigation of the property is made it must be taken into account.

One will naturally ask when this decretion occurs and why it should not be construed as the kind of "depreciation from age and use" which was referred to by the court. It has been shown that where tie renewals are made as needed the renewals offset the decretion. In every property there is a period, after its first construction, during which renewals are very light, gradually increasing, and finally reaching a period when on the entire property they become reasonably uniform in amount each year in such a case as ties.

A railroad is not at any time ever "new" in the same sense that an automobile is purchased new from a dealer. The whole operation of getting a

new automobile takes an hour, the getting of a new railroad three hundred miles long takes three, four or possibly more years. The railroad which was referred to at the beginning of this discussion was actually commenced in 1877 and finished to its present terminus in 1889 some construction work being done every year during ten years of this period. From the beginning of the track-laying to the final completion of the finished road and putting it into operation, a period of many months must elapse during which ties, rail and other parts of the structure get hard wear under bad conditions. All this time decretion is accruing and in the case of a long line of road it might well be that the full amount of decretion in ties has accrued during construction.

Certainly no one would contend that deductable depreciation would begin before a property was finished, before it was even new in the sense that it was ready to begin giving service, yet that is exactly what happens in the case of the ties.

The answer would appear to be that the decretion in a public utility property, or that loss of service life of the various units which has disappeared, but *which never can be restored to the property* by any amount of maintenance or renewal which is justified by any consideration of economics or common sense, occurs during the early years of the life of the property. It is in a way a part of the process of development of a property, the change from a new instrument to an instrument of maximum service value. It would seem to the writer to be a wiser course to attempt, from an inspection of the physical

plant and accounts of each property, to fix a standard of normal condition, or economic maximum condition, and use that as a basis for the estimate of depreciation below that condition, rather than to compute total decretion and then attempt to offset all or part of it by estimating a wholly theoretical "going concern" or "cost of development" element of intangible value and adding that.

Is it not much more rational to stick to the proposition that capital accounts should represent the bona fide investment in property plus accretions, and that this investment secured a plant in maximum service condition or what may be termed normal service condition? Then any dropping below such maximum condition is depreciation to be deducted. The measure of that depreciation is the amount of money that should be spent on the property to bring it back to normal service condition. This form of computation is perfectly rational and does not go nearly so far into the realms of guessing, hypothesis or conjecture as is required by the other method which has been described and which has been most generally used.

The writer does not believe that decretion should be considered as depreciation, or deducted from value, in rate cases, unless it appears from an examination of the accounts that special accounting has been done and estimated annual allowances have been set up and reserves accumulated to cover the decretion. Where this has been done and where money has been put into funds which are being used by the company, the investigation must go to

the use of money. Clearly the company may not collect from the rate payers for replacement and decretion and at the same time use the money so collected for other purposes and still claim a return on the full investment.

The obligation to take notice of the method of accounting used in the past and allow for it is just as heavy on the regulating body as the obligation to deduct depreciation when it exists, and clearly requires the regulating body not to deduct that which does not in actual fact exist as loss of value:

"If, in the past, reconstruction and replacement charges have been met out of current expenses, the fact must be taken into consideration, both when we come to estimating future net income and in determining what sum shall annually be set aside to guard against future depreciation." (*Lincoln Gas and Electric Company vs City of Lincoln,* 223 U. S., p. 349, 1912.)

It may be contended that the foregoing argument is based wholly on the illustration of the ties and that it is not applicable to other items, even of the track.

As has been stated, it is necessary for purposes of estimating to use such divisions of property or material units as may be traced to the accounting records of the company. What has been said of ties is equally true of rail, but be it remembered that rail is replaced several miles at a time, so that instead of the *average* mile as a basis for rail replacement studies, it would be necessary to take the entire line, say from Detroit to Chicago. Inasmuch as the

rail *wears* out, and as the real basis for decretion is the rather indeterminable one of work units, it is necessary on each road to establish actual experience, when it will be found that the same principle applies and that decretion on a large system will be found to stand at some fairly definite percentage.

While considering railroad track it must be borne in mind that many thousands of miles of track exist which have not only not depreciated but which have actually grown better year after year although all the time carrying just as much decretion (and no more) as at the present time. Indeed any new track, just completed, is far from being as valuable or as safe as the same track will be after the expiration of ten or fifteen years of proper maintenance.

The views herein expressed are directly in line with a number of recent decisions of courts.

In *New York and Queens Gas Company vs Newton,* 269 Fed. 277, Special Master Gilbert discusses depreciation at considerable length:

"*No Reduction for 'Accrued Theoretical Depreciation.'* In determining that the complainant's property has a fair present value of at least the amount of the complainant's actual investment therein as found by me, viz. at least $1,655,877.94. I have made no deduction for what is termed 'depreciation,' in whatever way calculated. Under any basis of determining present value, the complainant's property is now worth at least the amount of such investment therein, and the sound rule of law and policy seems to require the allowance of a reasonable return upon at least that sum."

"*Present Condition of the Property.* Mr. Miller testified that, as of April, 1920, the expenditure of $6,144.07 for repairs, renewals, and replacements, would put the plant, structures, ma-

chinery, and equipment in condition substantially as good as when they were erected or installed. His testimony in this respect was not contradicted by that of any witness. This sum, however, does not, in my opinion, measure any impairment in the present value of the property used and useful in the gas business. It represents merely an unmatured obligation to maintain the property in efficient operating condition out of future earnings; the expert witnesses of both the complainant and the defendants agreeing that it was and is maintained in efficient and first-class condition. I therefore have not deducted this or any other sum representing so-called 'accrued depreciation' from the amount found by me to represent the investment of the complainant in its gas property upon which it is entitled to have its rate such as to yield a reasonable return."

This finding was approved by Judge Mayer of the United States District Court on Dec. 13, 1920, and by the Supreme Court on March 6, 1922.

Just one week previous to this the United States Court of Appeals, for the Sixth Circuit, in a decision of Judge Knappen ruled on depreciation in a taxation case, *Nashville, Chattanooga and Saint Louis Railway Company vs United States,* 269 Fed. 351, Dec. 7, 1920:

"The testimony, considered as a whole, tended to support the conclusion that the amounts expended by defendant during the years in question for repairs, renewals, and replacements should and would have fully offset the depreciation in the various units, and that the defendant's railway and structures were, as a whole, maintained throughout the years in question in fully as good condition, and were of fully as great intrinsic value, as at the beginning of the respective years. The jury would have been clearly justified in inferring from the testimony of defendant's chief engineer, taken as a whole, that the value of the roadway had not depreciated during the two years in question; in other

words, that the repairs and renewals that had been made were of such a character as to leave the road at the end of each year of value equal to that at the beginning of the year. That officer's testimony so impressed the trial judge, who stated his opinion from the evidence that 'there is no reasonable deduction for depreciation established.' Defendant did not directly controvert the situation so shown. Its chief, if not its only, reliance seems to have been on the proposition that, in spite of it all, there was inevitable annual depreciation in some of the perishable elements not entirely renewed or replaced, so justifying the contention that for this reason there was depreciation within the meaning of the act, even though the roadway as a whole had not decreased in value. To this argument, as already said, we cannot assent. It follows that the trial judge rightfully refused to instruct verdict for defendant.

"Finding no error in the record, the judgment of the District Court is affirmed."

It is impossible to get away from the consideration of the two general groups into which all utility properties must be divided for purposes of depreciation accounting. Ratio of operating expenses to gross earnings must be kept uniform or reasonably so year after year if the company is to avoid years of apparently excessive profits or years of apparently light profits or losses, a condition which would greatly tend to impair credit and value of securities.

The track, consisting largely of ties, rail and labor, can be classed as property which may be kept in uniform condition by charging replacements to operating expenses. The many thousands of single items, the possibility of replacing parts continuously from day to day without disturbing service, make this an ideal illustration of the one class.

Large machines like waterworks pumps, electric turbo generators or other very costly single units, great railway terminal properties, dams and hydraulic properties, and other large things which cannot go out of service without seriously affecting the operating expenses if charged in one year are most notable examples of the other class.

Midway between these extremes are many kinds of property which in the case of one company can be handled by direct charges to operating expenses, while in the case of other companies might be better handled through the creation of reserves.

In every case, however, *decretion* exists. It may be that deductable depreciation or loss of value also should be found, but this is not decretion or "theoretical depreciation" and should not be confused with it. The fact can only be disclosed by a careful accounting investigation as well as by a thorough physical inspection and the test of depreciation or loss of value is as to whether or not it is economically justifiable to make an expenditure of money in maintenance that has been neglected or replacement that is overdue.

If the company has collected from the rate payers through charges to operating expenses for some building or machine or piece of equipment which takes over the functions of some other building or machine and the latter goes out of service, but remains in position or is converted to some inferior service, there is clearly a case of the kind of depreciation referred to in the Knoxville and Minnesota rate cases. There are probably few if any proper-

ties which do not have a number of instances of the kind referred to by Justice Hughes when he spoke of "old structures and equipment remaining on hand." There are probably few properties in which there will not be found a considerable amount of depreciation which should be deducted in finding "fair value."

The writer is by no means an advocate of the theory that investment in public utility property once made should not be reduced by the deduction of depreciation which amounts to loss of value. No such contention can possibly be sustained. It is, however, contended that elapsed life, decretion, or progress toward replacement, let it be called by whatsoever name one will, is not depreciation in the sense that the Supreme Court used that word when saying that a deduction should be made. If there exists in the property any part which ought to have been replaced or is now ready for replacement, and the replacement can be justified, there certainly is depreciation or loss of value which can be measured by the amount of money which should presently be spent to put the property as a whole in proper condition.

In a great modern office building there will be found hundreds of cubic feet of brick walls or tile walls, thousands of square feet of glass or of plastering. If the building is ten years old there is *decretion* or elapsed life in every item. In making a valuation of the building one uses these units for the purpose of computation, but one does not sit down with four or five associates and place an ar-

bitrary life of twenty years on glass and then deduct 50 per cent of the total reproduction cost of the glass.

As far as physical property depreciation is concerned, one makes a careful examination of the property and estimates the total replacement of glass and total labor to bring it back to maximum condition and replace all broken panes.

The *depreciation of the building* is not based on the physical property condition alone. Obsolescence, the changing character of business in the neighborhood and other similar factors cannot be ignored and these things account for loss of value to a far greater extent than any mere failure to maintain. Some of these elements might perhaps be deductable, others it would seem should not be because they are a burden on future consumers, not on past or present consumers.

The writer is of the opinion that the proper method of fixing the amount of physical property depreciation is to make a study of the property under investigation, determine its proper normal condition taking into account the extent and character of the business, the demands upon the property, the extent and quality of past maintenance over a period of years, and to estimate carefully the work that ought to be done to bring the entire property, as one operating entity, up to the normal operating condition, or the maximum condition in which it should be maintained having due regard for all economic considerations.

No expenditure that is not justified by sound busi-

ness judgment should be included. The obligation upon the company to maintain its property always is in existence. The obligation is on the public not to demand an expenditure that is not economically justified. Replacement and maintenance costs must be borne by the *consumer,* hence the consumers constitute that part of the public most vitally interested.

Property which has ceased to function, but which still exists, will generally have been superseded by other property, and in all such cases the question as to whether or not it should be included in the valuation or should have deduction made on account of loss of value by reason of the new use or of non-use can be readily determined.

Robert A. Carter and William L. Ransom summarize and paraphrase their conclusions drawn from a study of recent court and commission decisions as follows:

"If a utility's patrons have received its service at a fair price based upon *actual cost* including a *fair return on its investment,* and *not* at a price *inflated* by the arbitrary inclusion therein of a provision for *theoretical depreciation,* no deduction for depreciation should be made from the value of its property. If on the other hand, it has been so misguided as to accrue 'reserves' on the 'theoretical depreciation' basis and has *exacted* from its patrons an additional charge therefor, the amount thus exacted is commonly *deducted* from the value of its property."

The American Society of Civil Engineers' Committee reaches conclusions as follows:

"(*a*) Replacement Method.—If by order or sanction of a regulating body, or by long continued proper custom under no regulation, a property has been maintained in normal working condi-

tion, necessarily less than new in some or all of its parts, by the replacement method, and at any given date is being valued for any public purpose and at that date shows normal condition, all its several parts being in as good condition as could be expected, the accounts showing that always those amounts have been expended in renewals that were necessary to keep the property in normal working condition, and the fact appearing that no expenditure reasonably to be expected could put the property in better than the normal condition in which it is found, and that no unusually large expenditure is presently to be necessary for this purpose, then, in spite of the fact that there is an existing decretion in its several parts, there should be found no depreciation of valuation. Under the method of accounting, the public has not paid, and could not pay, for the accrued depreciation, and under this condition its accrued obligation to pay should be considered an asset of the company owner."

* * * * *

"(*b*) Allowance Methods.—If either the straight-line or sinking-fund theory has been used in computing depreciation and the method of accounting for it has been prescribed by a regulating body or voluntarily followed by a company owner from the beginning, the same theory, so far as it applies to the property in question, should be used for estimating the cost of decretion, and the entire cost so found lessened by any accumulated depreciation funds will appear as depreciation of valuation, unless the sinking-fund method of accounting has been used. In the latter case, if the valuation has to do with the reasonableness of the return and the accounting is to go on as before, apparently existing depreciation would not be *depreciation of valuation,* and therefore would not be deductable; but if the valuation has to do with condemnation or purchase, then, as in other cases, the apparently existing depreciation is depreciation of valuation, and the owner should receive the depreciated value of the physical property and the existing fund." *

The writer believes that these opinions are sound as to non-obsolescent property.

* See *Trans. Am. Soc. C. E.*, vol. 81, pp. 1493–1494.

CHAPTER XII

OBSOLESCENCE

Obsolescence has been defined by the American Society of Civil Engineers' Committee on Valuation as "The condition or process by which units gradually cease to be useful or profitable as part of the property on account of changed conditions." This definition is broad enough to include all forms of outgrown, inadequate or obsolete property.

A generator in an electric power station, installed within five years, may be rendering just as good service as on the day of its first operation, and may be generating current at no higher cost than when first installed. But new inventions have been made and more modern types of generators are on the market which are capable of producing current at considerably less cost. Here is an illustration of obsolescence, although the unit may be in perfect condition and doing all that it was guaranteed to do. It may be that the business being served is of such a character as not to justify the replacement of the machine.

A railway passenger terminal originally built to serve a city of 75,000 people is too cramped and small to give modern or proper service to the city

now increased to 250,000 population. While still in use and in excellent physical condition, it is completely inadequate and its replacement is only a matter of time and the ability of the railroad to finance the new project.

A hotel in a large city built a few years ago has lost its high class patronage for the reason that a change in the kind of business or character of population in its immediate vicinity has left it in a section of the city that is distinctly undesirable, remote from the office and shopping districts which formerly were in its neighborhood.

These, and many other examples which might be cited, indicate that obsolescence in some of its many forms has a real bearing on the question of value. In the case of such property as the hotel, or the large office building, there always exists the possibility that the shifting of business may wipe out a large part of the value of the improvement to land.

There has been no uniformity of practice among valuation engineers in the matter of treatment of obsolescence. One will disregard it entirely, another will consider it and possibly modify his figures slightly on account of the obviously obsolete character of certain units of property, while a third will make heavy deductions in arriving at fair value.

It is time that this question was squarely met and some uniformity of treatment agreed upon.

Manifestly, if the investor in an enterprise is to have a return on his investment and to have his money back when he goes out of business, he must,

especially if he is going into such an investment as the hotel or the office building, have keen regard for this matter of obsolescence and must plan to amortize his investment in considerably less time than he would if no such thing existed.

Whether the utility corporation should do the same thing is the question at issue. There is a fundamental difference between the owner of the hotel and the owner of the generator.

It appears to the writer that there should be a sharply drawn line between the treatment of obsolescence in the case of the public utility property which was built to render a continuing service of indefinite life, and that of the non-utility property, such as the hotel or the office building, where service terminates when the plant reaches the end of its life, and where there is no obligation to continue the service.

In the latter case it is clearly good business policy to attempt to anticipate and provide for the possible early retirement of the property.

The problem, as far as it affects public utility properties has two aspects: What is the proper accounting treatment? How shall obsolescence be treated when arriving at "fair value" for rate making?

The two parties at interest, the investor and the rate payer will naturally tend to take opposite views on these questions. The report of President Theodore N. Vail to the stockholders of the American Telephone and Telegraph Company (quoted on pages 78 to 85) takes the stand that obsolescence

and inadequacy, supersession by reason of new inventions and discoveries, and changes in popular demand or public requirements are among the main reasons for creating large reserves.

The memorandum filed with the Interstate Commerce Commission by Robert A. Carter and William L. Ransom already referred to, discusses this subject from the rate payers' viewpoint as follows:

"The wearing parts of units of railway property are currently repaired as needed, and the effect is to maintain the unit in existence and in high operating efficiency, for an indefinite and undefinable period, and the expense of this repair and replacement of wearing parts is properly assessed by the company executives against the current cost of rendering the service in which the use and wear took place.

"The responsible executives of the carrier also realize that although the newly installed unit may continue in use for an indefinite and incalculable period, if thus maintained in good operating condition, it may go out of use, for other causes than wear or the flight of time, and that such retirement from use may come about at almost any time—a time in no way susceptible of estimate at the time it is installed, but varying altogether with the particular carrier, the particular territory being served, the nature of the service being rendered, the various factors affecting the cost of service, and the like. The unit may be retired from use because it has become *inadequate* to meet the growing demands for service (and hence is uneconomical) or because new inventions have resulted in improvements in the type of a given unit, making its retirement *economical* in the interests of future patrons. A larger volume of traffic can be handled or the existing volume of traffic can be handled more cheaply or more efficiently, if the present unit is removed and a new one put in, although the unit taken out is still functioning as efficiently as when installed. The time when such supersession of a unit will take place cannot be forecast in terms of years, by company executives, engineers, or anyone else, at the time the unit is installed. 'Tables of useful

lives' of units of that kind are unavoidably conjectural and speculative, bearing no possible relationship to the controlling factors, which vary utterly with the individual instance. To try to 'assign' a probable period of 'life' to the unit when it is installed, and then charge against current rates an accrual based on the amortization of the cost of the unit over that period, is to set up a system of swelling operating expenses and 'padding' rates on a basis of mere conjectures, because with the great mass of railway property its proper maintenance by current repairs consigns all 'life tables' to the realm of silly impracticabilities, and supersession, when it does take place, occurs for causes in no way related to such 'life tables.' Moreover, such supersession comes about for causes which make improper the amortization of its cost through increased rates during the period before it is superseded. The unit did not *wear out* in the service of the patrons it served. They paid the cost of maintaining it in good, undiminished operating efficiency; there is no reason why they should, in addition, pay the cost of retiring it to put in a new unit which will serve *more* patrons or serve *future* patrons *more cheaply*. The existing unit was serving present patrons efficiently; the cost of retiring it to put in a larger or more economical unit becomes a proper charge against those who will be served and benefited thereby. The expense of retiring property should therefore be borne *by current or future charges, and not by anticipatory accruals* (*Kansas City Southern Railway Company vs United States,* 231 U. S., 423, 451–2); in other words, the retiring of a very large unit may necessitate the distribution of the amortization of the investment therein, over a short period of succeeding years.

"It thus appears that wherever departure is made from the actual current outlays, year by year, for repairs and for the renewal and replacement of property withdrawn from service, 'depreciation' charges in operating expenses should in any event be restricted to those necessary to equalize from year to year the charges for extraordinary repairs and for renewals and replacements which occur irregularly. As experience shows that in large plants and other utilities whose property is distributed sufficiently widely to be subjected to a variety of hazard, the actual

costs of repairs and retirements tend to equalize themselves when taken over a period of years, it is apparent that there is no need at all for permitting the introduction of estimated charges in operating expenses to cover the matter of 'depreciation' in connection with the determination of a fair level of rates as defined in the statute, unless the Commission contemplates frequent readjustments of the rate level. If such frequent readjustments are contemplated, the regulation of such charges should be based on the actual present and past experience of the carriers, and the charges themselves should be proportioned on the basis of the work done rather than on mere lapse of time."

There is no known rule for estimating obsolescence. In one case with which the writer was connected one engineer testified that certain street railway track in a city, built at a cost of over $60,000 per mile, an entirely new line constructed with new material on streets never previously occupied, less than a year old, should have a deduction of 15 to 20 per cent on account of obsolescence because the standard plans under which it was built were fifteen years old and the general advance in knowledge of the art was such as to justify the charge that the type was obsolete. There are thousands of cases of plant which is obsolete but still rendering excellent service under conditions which do not warrant its supersession. It is probably correct to say that there is little service property of any kind in America that is not to some degree affected by obsolescence.

Any attempt to fix a figure, in dollars, to be deducted in case of valuation, as *loss of value* on account of obsolescence, is conjectural and hypothetical in the extreme. It must be remembered that

there are hundreds of little utility companies in hundreds of little communities, which are giving a service that is desired and essential to the welfare of the community, which are operating on so small a margin of profit that they cannot keep abreast of the latest developments. The consumers can not hope for either the quality or cheapness of service that can be given by the great corporation in the great city. Public policy will not permit the establishment of accounting rules which will permit the owners of such properties to set up reserves to care for possible future obsolescence and thus place a burden on consumers who derive no benefits. Public policy should not permit the owners of the property to be penalized for conditions which they cannot control when the fixing of value for rates is the issue.

It seems clear that when the great utility property finds it economical to displace an engine or generator or other piece of property on account of the fact that operating economics can be affected, the computation should include the carrying of the unamortized portion of the superseded unit. The rate payers served by the new and more economical unit should complete the amortization of the unit which was displaced in order that they might get the advantage of the greater economy of the new unit.

Changes on account of obsolescence or inadequacy are never made unless there is a clear saving by reason of the change, or unless the business has grown more rapidly than was anticipated, or unless the growth and development of the community war-

rants a complete change of plant to allow for this development.

In either case the burden ought not to be placed on the owner of the property, nor yet on past consumers. The consumers of the product of the new and more economical unit are the ones who should carry the cost of progress. They should not derive a benefit from excessive rates charged to consumers in early years, the excess charge being based on the assumption that the change *might* take place.

It has already been argued that the rate payer should not be made to pay excessive charges to depreciation. He should pay all operating expenses. He should pay for all renewals of property worn out in service, he should provide enough money to equalize from year to year the charges for extraordinary repairs, but he should not be made, under the guise of "depreciation" or "obsolescence" to pay rates which will in addition to these things build up a large surplus for the benefit of the owners of the property.

When it comes to the question of "fair value," it would seem that the treatment already proposed would be adequate.

No deduction from value on purely conjectural grounds should be considered. If a property has obsolete equipment or equipment that is not wholly up to date it seems fair to assume either that sound business policy will dictate its replacement by a more economical unit, in which case the question of obsolescence is one for future operating expenses, or that the economies to be affected are not enough

to justify the supersession. If this latter be the case the presumption is that the unit will continue to serve until worn out in service and replaced in the ordinary course of maintenance.

The United States Supreme Court has discussed this kind of depreciation in the Kansas City Southern case (231 U. S. 423), in the following language:

"The other kind of depreciation is the result of changes attributable to the inadequacy of the existing property to meet the demands of the future. The road or the structure have to be replaced with stronger or more efficient instrumentalities. *Abandonments occasioned by changes of this character are therefore chargeable to future earnings, for the reason that the improved condition of the road is not only designed to meet the demands of the future, but presumably will result in economies of operation, and so the resulting benefits will be reaped by those who hold stock of the company in the present and in the future.*"

The only other case in which this subject is fully discussed is in New York and Queens Gas case (269 Fed. 277) in which Special Master Gilbert reports as follows:

"*The Renewal and Replacement of Gas Property.*—In other words, in order to keep abreast of improvements in the art of making and distributing gas when and as it becomes economically advantageous to do so, and to meet the growing demand of the public for service more adequately and economically than would be possible through merely making additions and extensions to existing plant and equipment, larger or better and more economical and efficient units of plant and equipment are from time to time installed, to take the place of units which are still operating as efficiently as when first installed. *The loss due to such supersession cannot properly be said to have accrued during the period the superseded unit was in service. It occurred when supersession*

took place. It became a proper charge against the economies to be realized therefrom. It furnished no basis for the imposition of an additional charge against the user of the superseded unit during the period of its useful service, over and above the higher cost of operating it. Such a charge could not be justified, either on the ground that the unit was losing potential life, or that the capital invested in it was being consumed, because neither is true."

CHAPTER XIII

CONCLUSION

The attempt has been made in the previous chapters to discuss depreciation, and to touch upon those other matters which seemed essential to a clear understanding of the argument. "Fair Value" has been referred to only to the extent of setting up the two theories and making clear the issues now being presented to the courts in many cases.

The unprecedented growth of all of our American business, not only the utilities, but manufacturing and commerce of all classes since the Civil War, and especially since 1900 has given rise to a series of questions which never bothered our fathers. The great development of new industries, and the thousands of new inventions have added to the complications. Hence we have had to work out rules to govern the relationships between the utility companies and the millions of people who depend on their output. This we have called Regulation of Public Utilities.

Forty years ago no one gave thought to depreciation or cared much about how the accounting of the corporations was done.

Twenty years ago depreciation was set up in the early valuations, not so much for the purpose of deducting it, as to attempt to make a comparison of the existing property with the same property in an all new condition. Fifteen years ago we commenced to regulate and prescribe accounting methods.

Then followed a flood of discussion and depreciation was made a mysterious and complex thing by reason of the fact that one group of engineers wanted to deduct the accrued loss of service life, another group claimed there was no depreciation at all, while the accountants talked about another thing entirely and called it "depreciation." The use of such terms as depreciation, accrued depreciation, theoretical depreciation, physical depreciation, functional depreciation, and a number of others which were coined to try and express the idea which was sought to be conveyed only tended to complicate and confuse the subject.

What is now needed is greater clarity of expression and greater emphasis on the fundamental things.

The company which accepts a franchise to furnish service is under obligation to build a property, to maintain that property and to render that service, not for a month, or a year, but continuously, and in the case of railroads and many other utilities indefinitely.

The property so built is one instrument of service, and it is that property as a whole which must be considered, and not the materials and machines and labor that enter into it.

The money with which this property must be built comes from our own citizens of all classes. It is clear that money cannot be drawn into public utility investments unless there is reasonable prospect of a fair return and assurance that money so invested is protected and the permanency of the investment secured.

The one property, designed for service must be maintained always in a safe and adequate condition to render the continuous service that is required. The maintenance of that property and the replacement of its parts as they need renewal are operating expenses pure and simple. Property in maximum economic condition for service is the only thing which can be secured by investment. It must be kept in that condition by replacement of parts as they wear out. The obligation is to *maintain.*

The manner of accounting for replacement is a matter of detail not of principle. Whether replacements are charged to operating expenses direct when made, or whether reserves are created based on estimates of the proper amounts needed to perpetually maintain the property, is a matter of policy to be determined by the regulating commission or management. The plan adopted for the accounting allowances, "straight line" or some sinking fund method is purely a question of accounting detail.

The important thing is the maintenance of the property and the securing of the money for maintenance in such a way that operating expenses will be kept reasonably uniform year after year.

Loss of value or depreciation of valuation to be

found in determining of "fair value" represents the failure of the company to maintain its property and to make renewals when they were due and should have been made. An unmatured obligation to make a renewal is not loss of value.

The user of the product, the rate payer, should pay all costs of production and of maintenance of plant, and, sufficient to give such a return to get all needed capital for expansion. He should not be called upon for excessive charges, under the guise of "depreciation" or operating expenses, beyond the real needs of the company.

The consumer cannot be expected to underwrite excessive or ill-advised investments nor to guarantee a return on properties built where there is no real demand for the services.

This last statement seems to touch the difficult point. The commissions in charge of regulation are dealing with all kinds of properties—large and small, strong and weak—companies that are operated by business men of the highest degree of intelligence and companies that are controlled by men with no knowledge of the business except what they have picked up on some little, ill-designed and insignificant plant with no business and no future.

Human nature with its selfishness and prejudice and bias still further complicates the question; so that, in the last analysis, each case must be settled, as to its own details, by the commission in charge. Many things come in to influence the decision that do not appear in the record or in the opinion. It

is certain that new questions will continue to come up in the future as our national business grows, and that the work of regulation will tend to increase year after year. If we can establish a few more definite principles and especially dispose of these questions of depreciation and "fair value" we will have made real progress.

These public utility issues are matters of vital interest to the nation. The United States, as a nation, owes its oneness, its freedom from clan and dialect, to the fact that just as the population began to move back from the Atlantic seaboard, the railroad was developed, and as the railroad mileage increased and new lines reached into the unsettled territory the population increased. In a real way the prosperity, yes the life, of this nation is bound up with the prosperity of the railroads, because this nation more than any other nation in the world is built upon the foundation of railroad transportation.

In just the same way our cities depend upon the other utilities. Only through the invention of the telephone, the city transportation systems, electric light and electric power has the building of great cities been made possible and without all of them, and with them gas and water, we could not live in the cities.

The relationship between investor and rate payer, owner and user, public utility corporation and public, is one of the most intimate and vital business relationships to be found in the country. The ques-

tions at issue involve not thousands of dollars, but thousands of millions of dollars. Upon their right determination depends the existence and usefulness of the utilities; and the utilities make possible our present-day civilization.

APPENDIX

DEPRECIATION IN DECISIONS OF COURTS*

A STUDY of cases bearing upon the question of depreciation is of great value in that there is clearly reflected in the opinions of the courts the gradual development of the subject from its beginnings down to the present day.

In the presentation of cases in the following pages a strict following of the chronological order of the decisions has been adopted, and each quotation as given is complete so far as it has any bearing on the subject.

No attempt is made to select parts of decisions which seem to support the contentions which the writer has advanced in the foregoing chapters.

Such notes as accompany the quotations are intended to direct attention to the principal features of each case as the writer sees them.

The division into periods is purely arbitrary, but it is believed it will be helpful in reaching a full understanding of the case.

No attempt has been made to include state court cases or commission decisions except as a few of them seem to have special historical interest.

*Supreme Court and United States Courts.

The great volume of commission and court decisions of recent years are so fully presented and indexed in "Public Utilities Reports, Annotated," and in Whitten's "Valuation of Public Service Corporations," that it would be futile to do any more than has been here undertaken, namely to bring out the history of depreciation as it has been written by the courts of highest jurisdiction.

FIRST PERIOD

Early Decisions Bearing on Depreciation Prior to the Adoption of Uniform Accounting

The earliest cases throwing any light upon methods of maintenance and early accounting theories touching the subject of depreciation are two cases handed down at the same time, both decided in October, 1878 and found in 99 U. S. The two must be read together. The Union Pacific case treats of expenditures properly charged against earnings. The Kansas Pacific case disallows a charge to operating expenses of depreciation, the charge being for a reserve and not actually expended.

Union Pacific Railroad Company vs United States, 99 U. S. p. 402. Decided Oct., 1878, on p. 420, Justice Bradley:

"having considered the question of receipts or earnings, the next thing in order is the expenditures which are properly chargeable against the gross earnings in order to arrive at the 'net earnings' as this expression is to be understood within the

meaning of the act. As a general proposition, net earnings are the excess of the gross earnings over the expenditures defrayed in producing them, aside from, and exclusive of, the expenditure of capital laid out in constructing and equipping the works themselves. It may often be difficult to draw a precise line between expenditures for construction, and the ordinary expenses incident to operating and maintaining the road and works of a railroad company. *Theoretically, the expenses chargeable to earnings include the general expenses of keeping up the organization of the company and all expenses incurred in operating the works and keeping them in good condition and repair;* whilst expenses chargeable to capital include those which are incurred in the original construction of the works, and the subsequent enlargement and improvement thereof. With regard to the last mentioned class of expenditures, however, namely, those which are incurred in enlarging and improving the works, a difference of practice prevails amongst railroad companies. Some charge to construction account every item of expense, and every part and portion of every item, which goes to make the road, or any of its appurtenances or equipment, better than they were before; whilst others charge to ordinary expense account, and against earnings, whatever is taken for these purposes from the earnings, and is not raised upon bonds or issues of stock. The latter method is deemed the most conservative and beneficial for the company, and operates as a restraint against injudicious dividends and the accumulation of a heavy indebtedness. The temptation is, to make expenses appear as small as possible, so as to have a large apparent surplus to divide. But it is not regarded as the wisest and most prudent method. The question is one of policy, which is usually left to the discretion of the directors. . . . But for making all ordinary improvements, as well as repairs, it is better for the stockholders, and all those who are interested in the prosperity of the enterprise, that a portion of the earnings should be employed. We think that the true interest of the government, in this case, is the same as that of the stockholders; and will be subserved by encouraging a liberal application of the earnings to the improvements of the works." (Italics ours.)

It must be kept in mind that at this period there was no governmental control exercised except in one or two states. "Injudicious dividends," "heavy indebtedness," "to make apparent surplus to divide," "is usually left to the directors," are significant of conditions not now prevalent, in these times of regulation. This case recognizes the keeping the works in good repair, as an operating expense. This is a frank recognition of the propriety of charging operating expenses not only with "repairs" but also with "all ordinary improvements."

United States vs Kansas Pacific Railway Company, 99 U. S. p. 455. Decided October, 1878.

In this case the court refers to the rule for determination of net earnings as announced in *Union Pacific Railroad vs United States* and says, p. 459:

"It is proper, however, before concluding, that we should indicate our opinion with regard to certain classes of expenditures on which the government and the company are at issue."

The former insists that certain items should be excluded from the account which are claimed by the latter to be legitimate. These items are designated in Schedule C, annexed to the findings of the court below and are as follows:

"First. 'Depreciation account or expense not charged up.' *This is explained to be the amount necessary to put the road in proper repair, but which was not actually expended for that purpose. We are clearly of the opinion that it is not a proper charge. Only such expenditures as are actually made can with any propriety be claimed as a deduction from earnings.*

"*Second.* 'Construction account or improvements and additions to track,' etc. This item, according to what we have said in the Union Pacific Railroad case, ought to be allowed.

"*Thirdly.* 'Equipment account, or replacing and rebuilding rolloing stock, machinery, etc.' This item should also be allowed as an expenditure properly chargeable to the earnings of the road when actually paid out of earnings and not raised by the issue of bonds or stock.

"*Fourthly.* 'Real estate purchased for depot grounds, etc., and expense of same.' This item is a proper charge if actually paid out of the earnings, and not raised by bonds or stock." (Italics ours.)

This case clearly and unequivocally disapproved of the creation of a reserve and the charging to operating expenses of an allowance which was not expended during the year. Undoubtedly in view of conditions as to lack of control existing at the time it was a wise precaution. It will be noted that under modern accounting the second item would be an addition (capital) while the third is clearly a replacement, and the fourth an addition to capital. The interesting thing about these two cases is the great laxity of accounting methods which prevailed at the time.

Eight years later, in the October term, 1886, in *New York, Lake Erie and Western Railroad vs Nickals,* 119 U. S. p. 296, the court says on p. 306:

"A different view would lead to results which sound policy would seem to forbid, and which, therefore, it is not to be supposed were contemplated by the parties. For, if preferred stockholders become entitled to dividends upon a mere ascertainment of profits for a particular year, *the duty of the company to maintain its track and cars in such condition as to accommodate the*

public and provide for the safe transportation of passengers and freight would be subordinate to their right to payment out of the funds remaining on hand after meeting current expenses and fixed charges." (Italics ours.)

This decision is cited as an early recognition of the duty of the company to maintain its property as being paramount to the right of preferred stockholders to demand dividends, and is quoted, not as directly bearing on the subject of depreciation, but as showing early recognition of the method of keeping up the property by direct replacement.

Mackintosh vs Flint and Pere Marquette Railway, 34 Fed. 583. Decided March, 1888 by Judge Jackson, afterward Justice Jackson of the Supreme Court. On p. 601, speaking of the limitations upon the company and its directors placed by charter and mortgage agreement, the court says:

"They were entitled, as between the two sets of stockholders, to employ the net income in paying interest on prior bonds, old or new; *in making repairs on the road, buildings, and other property of the company so as to maintain their efficiency;* and in *meeting the expenses of equipment and renewals, which evidently refers to repairs upon and keeping up the rolling stock of the company,* but does not include the purchase of new equipment." (Italics ours.)

The decision deals in many figures and a résumé of many of the facts. On p. 608 the judge summarizes several pages as follows:

"If the whole cost of the steel rail betterments placed upon the road had been charged to construction account, as it properly

should have been, as between the two sets of stockholders, then the two items making up this aggregate of $88,890 might properly have been borne by earnings as an operating expense; but, instead of doing this, the roadbed, or track, is improved by substituting new steel rails for old iron rails; the difference in their value is charged to operating expense, and taken out of earnings; and then, when the old rail is used for sidings and spurs, it is charged sometimes, when the management think proper and so direct, to construction, and at other times no charge is made to construction, and the whole expense of the change . . . is made to fall upon the earnings. . . .

"Its effect was not *to keep the track in repair*—in the *same state of efficiency as it existed in on Oct. 1, 1880*—but to improve and enhance its value at the expense of earnings, which are thus reduced." (Italics ours.)

This decision is of interest as an early recognition of the distinction between maintenance expenses chargeable to earnings and additions to property chargeable to capital; and especially in that it holds that the property is to be held "in the same state of efficiency" as existed eight years before, through maintenance. This case did not reach the higher court.

Reagan vs Farmers' Loan and Trust Company, 154 U. S. p. 362. Justice Brewer says, p. 407, 1894:

"Again the sum of $302,085.77 appears in that table under the description 'cost of road, equipment and permanent improvements, admitted to have been included in operating expenses,' and is added to the income as though it had been improperly included in operating expenses. But before this charge can be held to be proper, it is well to see what further light is thrown on the matter by other portions of the report. That states that there were no extensions of the road during that year, so that all of this sum was expended on the road as it was. Among the items that go to

make up this sum of $302,085.77 is one of $113,212.99 for rails, and it appears from the same report that there was not a dollar expended for rails except as included within this amount. Now, *it goes without saying that in the operation of every road there is a constant wearing out of rails and a constant necessity for replacing old with new. The purchase of these rails may be called permanent improvements, or by any other name, but they are what is necessary for keeping the road in serviceable condition.* Indeed, in another part of the report, under the head of 'renewal of rails and ties,' is stated the number of tons of 'new rail laid' on the main line. Other items therein are for fencing, grading, bridging and culvert masonry, bridges and trestles, buildings, furniture, fixtures, etc. *It being shown affirmatively that there were no extensions, it is obvious that these expenditures were those necessary for a proper carrying on of the business required* of the company. . . . Those are facts whose significance cannot be destroyed by any mere manner of bookkeeping or classification of expenditures." (Italics ours.)

This case is directly in line with the foregoing cases and shows that the maintenance of property in serviceable condition is to be through charges to operating expenses—the Replacement method of accounting for depreciation.

Southern Pacific Railroad Company vs Board of Railroad Commissions, 78 Fed. 236, 1896, quotes approvingly from Justice Brewer in the Reagan case and Justice Bradley in *Union Pacific Railroad vs United States,* cites numerous other cases and approves the charging of the same class of improvements to operating expenses. There are other cases cited in this decision which are not at all at variance with the doctrine laid down in 1878.

One of the most interesting cases of those decided prior to 1909 was that of *San Diego Water*

Company vs San Diego, a California case. This marks the first appearance of the argument for an annual allowance for replacement. While the case has no present weight in the light of more recent and authoritative opinions, it is of decided historical value. It is of great interest also on account of the dissenting opinion of Chief Justice Beatty which was at least ten years in advance of the trend of judicial opinion.

San Diego Water Company vs San Diego, 118 Cal. 556, Oct., 1897. Justice Van Fleet says, on p. 574:

"With regard to the question of the depreciation of the plant by use, it is sufficient to say that ordinary repairs should be charged to current expenses, that substantial reconstruction or replacement should be charged to the construction account, and that depreciation should not otherwise be considered. It is doubtless difficult in many cases to properly discriminate between current and ordinary repairs, and such repairs as amount in effect to new construction. Such difficulties when they arise, must be solved by the application of principles on which ordinary business enterprises are conducted."

Justice Garouette, in a concurring opinion says:

"This balance of $25,000 is profit, unless it is swallowed up by the finding of the court that plaintiff's plant suffered an annual depreciation of three and one half per cent, and the conclusion of law therefrom that a percentage upon the investment to that amount should be added to the operating expenses before the point is reached where profit begins. We are satisfied that this finding has no support in the evidence, even conceding the conclusion of law drawn therefrom is sound. In the first place, the evidence develops that there can be no general depreciation of

this plant as a whole. There are tunnels, wells, reservoirs, water rights and real estate, amounting to more than one-half the valuation of the plant. There is no depreciation of these things; there is no wear and tear, no permanent and gradual destruction by use and age. Most of them stand everlasting as the hills.

"The theory of the plaintiff in this regard seems to be that the life of a plant of this character may be approximated at thirty years, and that a sinking fund of one-thirtieth of its value should be collected from the rate payers annually and laid aside to be handed to the stockholders upon the sad occasion of its demise, as an alleviating salve to their sorrow. But such a thing is all wrong, for it results in the consumers of water buying the plant and paying for it in annual installments. Consumers of water cannot be charged with the cost of construction. They are only to pay a fair interest upon such costs; and as we look at this matter, if this 3½ per cent is not stowed away in the vaults as a sinking fund to make glad the hearts of the stockholders upon the expiration of thirty years, which theory cannot be tolerated for a moment, then it must go into the plant as cost of construction, and, therefore, not chargeable against the consumers. The result of such expenditure is only to increase the valuation of the plant and to thereby draw from the consumers an income upon the amount of the investment. If improvements are made in the plant, the cost of these improvements should be charged against the construction account. If repairs are made in the plant as it stands, as for example, a new pipe substituted for an old piece of the same size and quality, such charge should be considered operating expenses. . . . In cases of the present character under the head of operating expenses the company is entitled to charge for keeping the plant in its normal condition; and the sinking of new wells, the building of new reservoirs, the erection of additional buildings, and the substitution of larger and better pipe (to the extent of the difference), do not come under the head of operating expenses, but should be charged to construction accounts."

Chief Justice Beatty in the same case, in a dissenting opinion said on p. 588:

"Rates ought to be adjusted to the value of the service rendered, and this means that the water companies should be allowed to collect annually a gross income sufficient *to pay current expenses, maintain the necessary plant in a state of efficiency,* and declare a dividend to stockholders equal to at least the lowest current rates of interest, not on the par or market value of the stock, but on the actual value of the property necessarily used in providing and distributing the water to consumers." * * *

"As to current expenses, all operating expenses reasonably and properly incurred should be allowed, taxes should be allowed, and the cost of current repairs.

"In addition to this if there is any part of the plant, such as main pipe, etc., *which* at the end of a term of years—twenty years for instance, *will be so decayed and worn out as to require restoration—an annual allowance should be made for a sinking fund sufficient to replace such part of the plant when it is worn out."* (Italics ours.)

Judge Beatty's opinion is substantially in line with the Knoxville decision which was rendered twelve years later, and is the first recognition by any of the courts of the propriety of setting aside an annual allowance for the replacement of parts of the plant when worn out. Thus during the nineteen years from Oct., 1878 to Oct., 1897 the law as laid down by Justice Bradley in *United States vs Kansas Pacific Railway,* 99 U. S. 455, was accepted.

Brymer vs Butler Water Company, 179 Pa. State 231, Jan. 4, 1897. Justice Williams says on p. 251:

"They are entitled to a rate of return, if their property will earn it, not less than the legal rate of interest; and a system of charges that yields no more income than is fairly *required to maintain the plant,* pay fixed charges and operating expenses, provide a suitable sinking fund for the payment of debts, and pay a fair profit to the owners of the property, cannot be said to be

unreasonable. . . . The cost of the water to the company includes a fair return to the persons who furnished the capital for the construction of the plant, in addition to an allowance annually of a *sum sufficient to keep the plant in good repair* and to pay any fixed charges and operating expenses." (Italics ours.)

In this case there is the possible suggestion of a depreciation allowance. It certainly clearly allows for the method of "maintenance," or direct replacement.

Redlands, etc., Water Company vs Redlands, 121 Cal. 312. June 29, 1898. *Syllabus:*

"In a municipal ordinance fixing rates . . . the water company is not entitled to be reimbursed from the income derived from rates fixed by the ordinance for interest upon its indebtedness, *nor for depreciation of its plant, aside from the amount requisite for its maintenance and repairs during the year.*" (Italics ours.)

This case followed and referred to the San Diego case.

Milwaukee Electric Railway and Light Company vs Milwaukee, 87 Fed. 577, May 31, 1898, District Judge Seaman on p. 582, says:

"However valuable this testimony is for analysis of the bookkeeping methods and for correction of certain charges, it is clearly insufficient, without other support to contradict the undisputed testimony, both positive and expert, on the part of complainant, which verifies substantially its contention upon the disputed subjects of deduction, namely, that the expenditures so charged were largely, if not wholly, of such nature as to justify deduction for 'maintenance'; and that *depreciation is a well recognized fact in all such plants, for which allowance must be made to save the capital from impairment,* without any question of its entry upon the books." (Italics ours.)

The court quotes witness Beggs at some length on p. 583 as to depreciation, showing that about twelve miles of track per year must be reconstructed completely and that twenty car bodies per year must replace old bodies "to keep the property up to standard."

The court concludes that depreciation is an element to be taken into account before it can be determined that earnings are excessive, but holds that the final determination of the question is not necessary in this case. He says "depreciation is an important factor of safety in either view."

San Diego Land and Town Company vs National City, 174 U. S. 739. Decided May 22, 1899. Justice Harlan says on p. 757:

"The contention of the appellant in the present case is that in determining what are just rates the courts should take into consideration the cost of its plant; the cost per annum of operating the plant, including interest paid on money borrowed and reasonably necessary to be used in constructing the same; *the annual depreciation of the plant from natural causes resulting from its use;* and a fair profit to the company over and above such charges for its services in supplying the water to consumers, either by way of interest on the money it has expended for the public use, or upon some other fair and equitable basis. Undoubtedly, all these matters ought to be taken into consideration, and such weight be given them, when rates are being fixed, as under all the circumstances will be just to the company and the public." (Italics ours.)

San Diego Land and Town Company vs Jasper, 189 U. S. 439. Decided April 6, 1903. Justice Holmes refers to depreciation in a line on p. 446 as follows:

"We will say a word about the opposite contention of the appellant, that there should have been an allowance for depreciation over and above an allowance for repairs. From a constitutional point of view we see no sufficient evidence that the allowance of six per cent on the value set by the supervisors, in addition to what was allowed for repairs, is confiscatory. On the other hand, if the claim is made under the statute, although that would be no ground for bringing the case to this court, it has been decided by the Supreme Court of California that the statute warrants no such claim."

While neither of these cases is of special importance as far as throwing any light on the proper disposition of the subject of depreciation, both refer to it and it is clear that in the 1903 case contention was made for a depreciation allowance. The important thing is to note the lack of appreciation of the importance of the subject as late as 1903. It is evident that the so-called "depreciation accounting" which may properly be called the waterworks plan, had not secured recognition from the courts.

Perkins vs Northern Pacific Railway, 155 Fed. 445. Circuit Court Minnesota. Sept. 23, 1907. District Judge Lochren says on p. 451:

". . . and the showing was, in some cases, that there were no charges made, in the keeping of the accounts, under the head of for or on account of depreciation in the road or rolling stock, the property of the company. It is evident that there ought to be a proper account under that head; that a railroad, like everything else, will wear out in time, and they have been used so long in this country that there can be a reasonable estimate of the percentage of loss each year from depreciation of the roadbed, culverts, bridges, rolling stock; *that it would be proper to lay aside a reasonable amount to furnish replacements, renewals, and*

repairs when needed; and that if that was not done the railroad company might soon be in a position in which it could not keep up, with the receipts that it was getting, and maintain its property in an efficient state to render such service as the public is entitled to receive from it. Now this is a matter in which the public has an interest, as well as the railroad companies and the stockholders of the railroad companies.

* * * * *

"There is a danger that this feeling of selfishness may lead them too far, and reduce this compensation so much that it will not enable the railroads to serve them with efficiency—to keep up their roadbed, culverts, bridges, and everything so that they will be entirely safe for the transportation of passengers and freight, and to keep the rolling stock in the best state of efficiency and enable them to provide the best service attainable. And *that is exactly what those corporations are required to do. They are required to exercise the highest degree of care in relation to the transportation of passengers, and a high degree of care in relation to the transportation of freight,* and it is certainly for the interests of the people that they should be enabled to do this; and it would be a very short sighted policy which would reduce the compensation of these railroads to a degree that would disable them from performing these services fully and fairly for the benefit of the people." (Italics ours.)

This case is specially interesting as it makes the suggestion of the propriety of the establishment of reserves, if not for depreciation, at least to equalize expenditures between good years and lean ones. It again lays stress on the obligation resting on the road to maintain its property in the "best state of efficiency and enable them to provide the best service attainable."

The cases that have been cited cover all of the more important rulings of the courts on the subject

of depreciation from the beginning of our history down to 1907, the first year of the operation of the uniform accounting law, and with the exception of a few state court cases all have been referred to.

The points which it is desired to emphasize by this rather extended series of references are as follows:

There was no clear recognition by either courts, attorneys, accountants or operating officials of the necessity of providing for depreciation by the creation of an annual allowance, although in some of the cases this was contended for.

There is an unequivocal recognition of the wearing out of property, of the necessity for its replacement and maintenance, and of the duty of the utility to maintain its property in serviceable condition.

As the cases progress, there is a growing recognition of the necessity for separating capital expenditure from maintenance expenditures.

It must be borne in mind that these cases cover the period from the beginning of all utilities down to within fifteen years, and that, taken together, or singly, no argument can be drawn from them that any deduction from actual investment remaining in the property at the date of investigation should be made, nor can it be argued that an annual allowance should be set up and charged to operating expense, a thing that was specifically forbidden in the Kansas Pacific case.

The recognition of the method of the maintenance of the condition of the property through renewal of parts as they wear out may be seen throughout this

line of decisions, and it is clear that the so-called replacement method of accounting for renewals has the tacit approval of the courts during all of the period, although no such name was applied to it.

SECOND PERIOD

Decisions Bearing on Depreciation Following the Adoption of Uniform Accounting

The most important decision yet rendered on the subject of depreciation is that of Justice Moody in the Knoxville case. It should be borne in mind in reading this, or any other decision, that the immediate facts, as brought out by the proof in the case, have much bearing on the proper interpretation to be given the decision. It is believed desirable to give a somewhat more full quotation from this case than is usually done in order to bring out some of the facts.

City of Knoxville vs Knoxville Water Company, 212 U. S. 1. Decided Jan. 4, 1909. Justice Moody says on p. 9:

"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 company contends that the master, in fixing upon the valuation of the tangible property, did make an allowance for depreciation, but we are unable to agree to this. The master nowhere says that he made allowance for depreciation and the language of his report is inconsistent with such a reduction. The figures which he adopts are those of a 'fair contractor's

price.' The basis of his calculation was the testimony of an opinion witness called by the company. That witness submitted a table, which avowedly showed the cost of reproduction, without allowance for depreciation. The values testified to by him were adopted by the master in a great majority of cases. The witness's valuation of the tangible property was somewhat reduced by the master, but the reductions were not based on the theory of depreciation, but upon a difference of opinion as to the reproduction cost.

"The cost of reproduction is not always a fair measure of the present value of a plant which has been in use for many years. 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 expectation of life. But it is clear that some substantial allowance for depreciation ought to have been made in this case. The officers of the company, *alio intuituo,* estimated what they called 'incomplete depreciation' of this plant (which we understand to be the depreciation of the surviving parts of it still in use) at $77,000, which is 14 per cent of the master's appraisement of the tangible property.

"A witness called by the city placed the reproduction value of the tangible property at $363,000, and estimated the allowance that should be made for depreciation at $118,000, or 32 per cent. In the view we take of the case it is not necessary that we should undertake the difficult task of determining exactly how much the master's valuation of the tangible property ought to have been diminished by the depreciation which that property had undergone. It is enough to say that there should have been a considerable diminution, sufficient at least to raise the net income found by the court above 6 per cent upon the whole valuation thus diminished."

and again on p. 13:

"The company's original case was based upon an elaborate analysis of the cost of construction. To arrive at the present value of the plant large deductions were made on account of the depreciation. This depreciation was divided into complete depreciation and incomplete depreciation. *The complete depreciation represented that part of the original plant which through destruction or obsolescence had actually perished as useful property.* The incomplete depreciation represented *the impairment in value* of the parts of the plant which remained in existence and were continued in use. It was urgently contended that in fixing upon the value of the plant upon which the company was entitled to earn a reasonable return the amounts of *complete and incomplete* depreciation should be added to the present value of the surviving parts. The court refused to approve this method, and we think properly refused. 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 stockholders, and, in the case of a public service corporation at least, its plain duty to the public. If a different course were pursued the only method of providing for replacement of property which has ceased to be useful would be the investment of new capital and the issue of new bonds or stocks. This course would lead to a constantly increasing variance between present value and bond and stock capitalization—a tendency which would inevitably lead to disaster either to the stockholders or to the public, or both. If, however, a company fails to perform this plain duty and to exact

sufficient returns to *keep the investment unimpaired,* whether this is the result of unwarranted dividends upon over-issues of securities, or of omission to exact proper prices for the output, the fault is its own. When, therefore, a public regulation of its prices comes under question the true value of the property then employed for the purpose of earning a return cannot be enhanced by a consideration of the errors in management which have been committed in the past." (Italics ours.)

A careful study of this case in all its phases seems to justify the following conclusions:

(*a*) The depreciation to be deducted is *loss of value, and only loss of value.* The unusual division into complete and incomplete depreciation and the equally unusual claim that these amounts should be "added to the present value of the surviving parts," makes clear that the question at issue was the inclusion or exclusion of these amounts in the value to be found. They were excluded. The complete depreciation was "that part of the original plant which through destruction and obsolescence had actually perished as useful property." The incomplete depreciation was "impairment in value" of the remaining plant. Both clearly *loss of value.* This finding coupled with the clear statement that the duty of the owner is to "keep the investment unimpaired," "so that the original investment remains as it was in the beginning," clearly bar out any deductions from the appraisal except those that constitute loss of value, and such loss of value as can be restored.

(*b*) Depreciation is an operating expense. The company is to make provision "out of earnings" for

the replacement of property. "If a different course were pursued the only method of providing for replacement of property . . . would be the investment of new capital."

(*c*) The maintenance of the integrity of the investment is sought. The method of maintenance while not specifically laid down is indicated to be "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." This clause, and the further reiteration of the word "replacement" would indicate that any proper method which may be devised for replacing an old worn-out unit with a new one "out of earnings" will be approved. The decision certainly does not condemn the replacement method. Nor does it endorse the waterworks plan of depreciation accounting by means of an annual allowance for replacement. It specifically mentions neither. It is the company's "plain duty" to "make provision for its (the property's) replacement." Inasmuch as both methods are proper for certain classes of property it would seem to be clear that the company might choose the proper one to fit its conditions.

(*d*) Failure to provide for depreciation or replacement will close the door to consideration of any value that has disappeared. The true value—after the deduction of depreciation—cannot be enhanced by a consideration of errors of the management in failing to provide for replacement.

(*e*) The property is looked upon in this case as

one property, a *composite whole,* made up of many different parts. "It is not easy to fix . . . the amount of depreciation of a plant whose component parts are of different ages, with different expectations of life." "To arrive at the present value of the plant large deductions were made." From this point on the references to "the plant," "parts of the plant," seem to leave no doubt that the court considered the property as one instrument of service.

(*f*) In the determination of depreciation of any property, all of the causes of depreciation of any of the parts must be taken into account. "But that would lead to incorrect results if not diminished by the depreciation which has come from age and use." "The complete depreciation represented that part . . . which through destruction or obsolescence had actually perished."

There is only this one reference to obsolescence in this opinion, and nothing is said which can be construed as approving a deduction from the value of property units still in service, on account of obsolescence. Obsolete property which has disappeared, or ceased to perform the function for which it was originally installed is "complete depreciation."

This opinion brings out strongly the obligation resting on the public service company to maintain its property. It makes more clear than the earlier cases quoted, the obligation resting on the users of the utility to pay for maintenance, including depreciation. It clearly distinguishes between the sums to be provided for current repairs, and for deprecia-

tion or replacement, and it clearly recognizes "replacement of property" as making good depreciation.

Another important case bearing on depreciation was decided six weeks after the Knoxville case.

Louisiana Railroad Commission vs Cumberland Telephone and Telegraph Company, 212 U. S. p. 414. Decided Feb. 23, 1909. Justice Peckham, p. 423:

"There are one or two facts, however, now to be taken into consideration before the correctness of that conclusion can be affirmed. In the course of the trial various questions were argued as to the manner of conducting such a business as this with regard to extensions, earnings, and disbursements, as well as questions of depreciation of plant and how to treat the amount collected therefor, and other questions of that nature. Exactly how the money which resulted from the rates in actual operation was used was not in all cases shown in detail, either from the books or by oral testimony. Something was left in doubt and to conjecture. In the course of the opinion of the Circuit Court the following was said: . . . 'Counsel for the Commission argued that the complainant's property in Louisiana was not all paid for with complainant's capital, but was partly paid for out of a surplus or reserve, or depreciation fund, which was accumulated by complainant from the receipts of its Louisiana business, and was then reinvested, not in repairs and maintenance, but in extensions and additions to the property. This may be a fact, but it is not shown to be a fact.' . . .

"If the onus rested upon the Commission to show these facts it is evident that the obligation has not been fulfilled, but it is just here that the difficulty lies. *It was obligatory upon the complainant to show that no part of the money raised to pay for depreciation was added to capital, upon which a return was to be made to stockholders in the way of dividends for the future.* It cannot be left to conjecture, but the burden rests with the complainant to show it. *It certainly was not proper for the complainant to take the money, or any portion of it, which it received*

as a result of the rates under which it was operating, and so to use it, or any part of it, as to permit the company to add to its capital account, upon which it was paying dividends to shareholders. If that were allowable, it would be collecting money to pay for depreciation of the property, and, having collected it, to use it in another way, upon which the complainant would obtain a return and distribute it to its stockholders. That it was right to raise more money to pay for depreciation than was actually disbursed for the particular year there can be no doubt, for a reserve is necessary in any business of this kind, and so it might accumulate, but to raise more than enough money for the purpose and place the balance to the credit of capital upon which to pay dividends cannot be proper treatment. The court below said that it was impossible to find out from the books how much of this had been done, and it treated the fact as one to be explained by the commission and not by the complainant. We think, on the contrary, that the obligation was upon the complainant. Now, although the books, it is said, do not show how much money collected for depreciation has been, in fact, used to increase the capital of the complainant upon which dividends were paid to stockholders, yet still, even if the books do not show accurately, or even at all, what disposition was made of these moneys, at any rate the officers of the complainant must be able to make up some reasonable approximation of the amount, even if it be impossible to state it with entire accuracy, and this duty rests with the complainant, in order that it may discharge the duty devolving upon it to prove that the rates were not unreasonably high under Order No. 488, or in other words, that they were unreasonably low under Order No. 552. It may be that the sum, if any, thus used was not enough to affect the claim that the rates under discussion were unreasonably low. The evidence is insufficient to show clearly that which complainant is under obligations to show. *Knoxville vs Water Company,* 212 U. S. 1, *Willcox vs Consolidated Gas Company of New York,* 212 U. S. 19. We are not considering the case where there are surplus earnings after providing for a depreciation fund, and the surplus is invested in extensions and additions. We can deal with such a case when it arises."

And again on p. 427, the court says:

"But the burden, as we have said, rests with the complainant to prove its case, and it has not performed its obligation when this fact as to the disposition of the so-called depreciation fund is left so wholly in doubt. What is the amount reserved for payments for depreciation? What, if any of it, has been carried into capital? How much of the floating debt would carry interest which might be charged as against the amount of the depreciation fund actually used for extensions and additions and charged to capital? All these are questions not answered by the evidence in the case, and which should be made as clear as possible before an attempt ought to be made to answer the question as to rates. The whole case should, therefore, be opened, so that both sides can, on a new trial, bring out all the material facts upon which a decision can finally be based. We, therefore, reverse the decree and direct a new trial." (Italics ours.)

This case hinges on the disposition of the so-called depreciation fund. The decision recognizes the necessity of a reserve and approves the raising of "more money to pay for depreciation than was actually disbursed for the particular year," but it also holds that it is improper to raise more money than is needed for that purpose and to place the balance to the credit of capital.

In effect it would seem that the court held that it is not a *depreciation fund* to be returned to the owners to compensate them for the loss of value sustained through depreciation, or in other words to amortize the investment, but rather a *maintenance* fund to be held in trust and to be used to maintain the property always in a condition of complete efficiency. This decision may be taken as a warning from the Supreme Court that accounting must be

done properly. It is perfectly obvious that if excessive amounts are raised for a depreciation reserve the net earnings are understated. In view of all that has been said by the Supreme Court in prior and subsequent cases recognizing that it is the property itself, and not the cost of it, that is protected by the constitutional guarantee, it is not to be assumed from this language that the court ever intended to exclude property paid for out of excessive accumulations for depreciation, but rather to insist that reserves so created shall not be excessive, and that the accounting shall clearly show the disposition of these reserves.

A Kentucky Federal case is of interest in that it discusses the subject of a proper allowance to offset future depreciation, and again lays stress on the duty of always maintaining the property up to proper standard.

Cumberland Telephone and Telegraph Company vs City of Louisville, 187 Fed. 637. Decided April 25, 1911. U. S. Circuit Court W. D. Kentucky. District Judge Evans, p. 653:

"A very intelligent witness—George Wilkinson—in his deposition said: 'Depreciation may be defined as the loss in value of some destructible property over and above current repairs.'

"We accept this as a sufficiently accurate definition of that form of depreciation which now concerns us. What sum should, year by year, be set apart to resupply values lost in the current depreciation of what may be called the company's working plant is not always a matter of easy solution. . . . In estimating depreciation we shall, therefore, reckon it at 7 per cent on $1,575,000, which we have found to be the value of the destructible parts of the plant. In reaching this conclusion we have borne in mind that

the past is fixed. We cannot change it. But taking the company's plant as it now is and as it probably will become in the future, and remembering that the value of its real estate and working capital will almost certainly not depreciate at all, the problem has been to ascertain what per centum of the earnings of the company will be required to keep what is called its plant always in as good condition as it is now or as it may become. Of course our estimate could not be based upon the proposition that the per centum set apart to cover depreciation would be deposited in bank and loaned out from year to year so as to accumulate and be on hand at the end of fourteen years, and to be then used to construct an entirely new plant, and so on from period to period. *In such a case the public would not only have a service that would grow progressively worse until its operations ceased altogether, but it would thereafter get no service at all until a new plant replacing the old could be completed and put into operation. The question rather has been, what does experience show to be the proper average per cent of annual earnings which the company should expend in order to insure that its plant at the end of fourteen years will be as good as it now is, and in the meantime render to the public that good service which its duty to the public requires.* The master, after finding that the cost of the plant was $1,506,531.21, finds that its present value is only $1,355,878.09. If this is correct it certainly indicates that in the past enough money has not, from time to time, been expended upon the reconstruction and reinstatement to make good the depreciation and keep the ever-failing parts of the plant up to the standard by resupplying all values that have been destroyed. And if this is true, the company's inadequate expenditures in the past do not, per se, furnish a safe guide for the ascertainment of what should, in the future, be set aside for depreciation. . . .

"It may not be out of place in this connection to observe that in private business where the owner may fix his own prices for the use of the property his own honesty may compel him to keep the property he hires to others up to a standard that will induce them to use it, but no one can directly compel him to do so. It is different with public utility corporations. The owners in such

cases have not the absolute and uncontrolled right to fix their own prices for the use of the public of the utilities they furnish. Understand, prices may, within certain limits, be regulated by public authority, but when authority *attempts to regulate the rates to be charged for the use of the property of another, it must take into consideration and allow what would be a fair amount of the earnings of the property to be devoted to keeping it always up to the public standard.* What interest may force the private owner to do in respect to his own property the law compels public authority to do when the latter undertakes to fix rates to be charged by public utilities corporations." (Italics ours.)

This decision clearly recognizes the obligation to maintain the plant in a normal operating condition and the necessity of providing money with which to keep up to this standard.

Lincoln Gas and Electric Light Company vs City of Lincoln, 223 U. S. p. 349. Decided Feb. 19, 1912. Justice Lurton. *Syllabus:*

"What sum should be annually deducted from gross or net receipts of a public service corporation for depreciation and replacement and how it should be applied, are novel and grave problems, and, in the absence of a full report as to every element involved, this court is not justified in passing upon them."

On p. 363 the court says:

"The question as to what sum, if any, upon the facts of this case should be annually deducted from the net income as a permanent maintenance or replacement fund, is novel and presents a grave problem.

"Conflicting expert evidence has been introduced presenting radically different theories as to the necessity, character and amount of such a fund, and as to how it should be created, preserved and expended. Some of this evidence puts the sum to be annually deducted and set aside as a permanent fund at five

per cent upon the value of the plant at the time of deduction. It is obvious that if this view is sound there will be little or nothing of the net income left for distribution among shareholders, and no basis for legislative rate reduction now, and none likely until such time as the income from the permanent fund will keep up the plant. *The work of reconstructing and replacing old parts by new in a plant of this kind must, in the very nature of things, be going on constantly. Heretofore it seems to have been so well and continuously done that the value of the plant as a whole has suffered less than one per cent per annum if the total depreciation be distributed through the more than thirty years of operation.* So far as can be now seen, reconstruction and replacement charges have, up to the present time, been borne by current revenue, with the result that the revenue remaining in the single year of 1907 showed a net surplus of $73,851.83, a sum large enough, if distributed to shareholders upon the basis of the value of property engaged in the business as claimed by appellant, to have paid a dividend of ten per cent and about fifteen per cent upon the valuation settled by the Circuit Court.

"*There is no finding as to the extent of the application of the revenue of 1907 to reconstruction or replacement, as distinguished from current repairs and operating expenses.* It is, however, plainly inferable that the revenue of that year was used to the extent necessary. *If, in the past, reconstruction and replacement charges have been met out of current expenses, the fact must be taken into consideration,* both when we come to estimating future net income and in determining what sum shall be annually set aside to guard against future depreciation. This doubtless influenced the court below in settling upon the amount of $8,000 as a sufficient annual appropriation of income as insurance against future depreciation. *But if the constantly recurring necessity to do reconstruction or replacement work was in 1907 met out of the current income of that year, thereby diminishing the net income, the fact should be given weight in estimating future net income; otherwise there will be a double deduction on that account, first, by paying such charges as they occur, and thereafter by a contribution out of the remaining income for the same object.*

"The facts found are not full enough to at all justify this court in dealing with this problem of a replacement fund.

"There should be a full report upon past depreciation, past expense for reconstruction and replacement, and past operating expenses, including current repairs. We should be advised as to the gross receipts for recent years, and just how these receipts have been expended. *Then the amount to be set aside for future depreciation will depend upon the character and probable life of the property and the method adopted in the past to preserve the property.* It can be readily seen that the amount to be annually set aside may be such as to forbid rate reductions because of the requirement of such a fund. The matter is one for a skilled master, who should make a full report upon the value of the property, the receipts and the expense of operation and the sums paid out on reconstruction and replacements, and in dividends in recent years." (Italics ours.)

It is noted that in this case Justice Lurton speaks of the fund as a "maintenance or replacement fund," and as a "replacement fund," by inference placing the same construction as is to be drawn from Justice Peckham's Telephone decision, namely that the fund is not in a strict sense a depreciation fund to be paid to the owner, but rather a fund to be held in trust for renewal of the property for which it was created.

This case recognizes maintenance of the integrity of the property through replacement. "If in the past reconstruction and replacement charges have been met out of current expenses, the fact must be taken into consideration." Attention is directed to the fact that the replacing of old parts by new has been so well done that the value of the *plant as a whole* had suffered less than one per cent per annum.

Stress is also laid on "the character and probable life of the property and the method adopted in the past to preserve the property" as being important points for consideration.

There is also a clean-cut recognition of two methods of providing for replacement otherwise there will be a double deduction on that account, first, by paying such charges as they occur (the replacement method) and thereafter by a contribution out of the remaining income for the same object. (The method of reserves for replacement, or so-called depreciation accounting.)

This case, like the Cumberland Telephone case, raises questions as to methods of accounting and warns against excessive depreciation deductions. It is obvious that the creation of reserves, in excess of the real need of the property, and the resulting understatement of actual net earnings is contrary to the spirit of this opinion.

The Minnesota Rate cases, 230 U. S. p. 352. Decided June 9, 1913. Justice Hughes says in the Opinion on pp. 456 and 457:

"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 results.

"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 road-bed 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 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; that 'the road-bed was constantly increasing in value'; that it 'becomes solidified, embankments and slopes or excavations become settled and stable and so the better resist the effects of rains and frost'; that it 'becomes adjusted to surface drainage, and the adjustment is made permanent by concrete structures and rip-rap'; and that in other ways, a road-bed long in use 'is far more valuable than one newly constructed.' It was said that 'a large part of the depreciation is taken care of by constant repairs, renewals, additions and replacements, a sufficient sum being annually set aside and devoted to this purpose, so that this, with the application of road-bed and adaptation to the needs of the country and of the public served, together with working capital . . . fully offsets all depreciation and renders the physical properties of the road not less valuable than their cost of reproduction new.' And in a further statement upon the point, the 'knowledge derived from experience' and 'readiness to serve' were mentioned as additional offsets.

"We cannot 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 road-bed, 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 admitted 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.) In the present case, it appears that the engineer of the state commission estimated the depreciation in the property as between eight and nine million dollars. If there are items entering into the estimate of cost which should be credited with appreciation, this also should appear, so that instead of a broad comparison there should be specific findings showing the items which enter into the account of physical valuation on both sides.

"It must be remembered that we are concerned with a charge of confiscation of property by the denial of a fair return for its use; and to determine the truth of the charge *there is sought to be ascertained the present value of the property.* The realization of the benefits of property must always depend in large degree on the ability and sagacity of those who *employ it, but the appraisement is of an instrument of public service, as property,* not of the skill of the users. *And when particular physical items* are estimated as worth so much new, if in fact they are depreciated, this amount should be found and allowed for. If this is not done, the physical valuation is manifestly incomplete. And it must be regarded as incomplete in this case. Knoxville vs Knoxville Water Company, 212 U. S. 1–10." (Italics ours.)

In this case the court recognizes the points noted in the Knoxville case as follows: (*a*) The Depreciation noted is loss of value, "the depreciation is not that which has been overcome by repairs and replacements." (*b*) Depreciation which has actually taken place must "be found and allowed for," it must be "shown and deducted." (*c*) The property is treated as one composite whole. "The appraisement is of an instrument of public service, as property . . . and when particular physical items are

estimated, etc." "In many parts of the plant there should be such depreciation, as for example in old structures and equipment remaining on hand." Throughout the reference is to "the plant" and "the property." (*d*) Age, wear, and apparently obsolescence, are all recognized as causes of depreciation. "Structures become antiquated, inadequate and more or less dilapidated," "are worn out or discarded for newer types." These expressions leave little room for doubt. In addition this case settles the question that there must be specific findings of depreciation and not a broad offsetting of appreciation against depreciation.

The Minnesota Rate case also unequivocally recognizes the propriety of keeping the investment intact and overcoming depreciation by the replacement of parts of the property. The views of the court in this respect are indicated by the reference to a statement in the findings of the Master that "a large part of the depreciation is taken care of by constant repairs, renewals, additions and replacements," and the court's own subsequent statement "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 a new one." There is nothing in the Minnesota Rate cases bearing on the use of the reserve or allowance method of accounting.

While the court does use the term "actual existing depreciation in the plant as compared with a new one" in referring to the necessity for deducting depreciation in making an estimate on the basis of

reproduction new, it is not to be inferred that a purely conjectural or hypothetical figure is to be approved. The case is too clear on that point, in sections of it referring to land valuation, to leave any room for doubt as to what is meant by the clause just referred to. Actual loss of value, computed by a rational method, and capable of proof, is to be deducted from the fair value of the plant as a whole.

The next case in chronological order after the Minnesota Rate cases was the Kansas City Southern Railway case decided six months later by Justice Pitney. In view of the importance of this case from an accounting standpoint, and on account of the light it throws on the court's own interpretation of depreciation principles stated in the Knoxville Case, the decision is quoted at considerable length.

Kansas City Southern Railway vs United States, 231 U. S. p. 423. Decided Dec. 1, 1913. Justice Pitney gave the decision. On p. 444 he refers to capital accounts and operating accounts as follows:

"We are thus brought back to the fundamental distinction between (*a*) the property or capital accounts, designed to represent the investment of the stockholders, and to show the cost of the property as originally acquired, with subsequent additions and improvements; these assets being balanced by the liabilities, including the amount of the capital stock and all bonded and other indebtedness, with net profits or surplus, whether carried under the head of "profit and loss" or otherwise; and (*b*) the operating accounts, designed to show, on the one side, gross receipts or gross earnings for the year, and on the other side, the expenditures involved in producing those gross earnings and in *maintaining the property,* the balance being the net earnings."

On p. 447 Justice Pitney discusses depreciation in the following language:

"The contention of the appellant that property, originally acquired because necessary in the construction of the road, and afterwards abandoned only because rendered unnecessary by the improvement and development of the property, should remain in the property account as a part of the stockholders' investment, will be found, upon analysis, to rest upon the unwarrantable assumption that all capital expenditures result in permanent accretions to the property of the company. This in effect ignores depreciation—an inevitable fact which no system of accounts can properly ignore. A more complete depreciation than that which is represented by a part of the original plant that through destruction or obsolescence has actually perished as useful property, it would be difficult to imagine. The fact that the original investment was necessary in order that the second investment might be made is not a conclusive test. Reference is made to the cost of the scaffolding used in the erection of a house, and discarded when the house is completed; and to the cost of the paper that goes to the waste basket, rather than to the printer, in the preparation of a literary composition; but these are fanciful analogies, and do not assist us, where the real question is not how shall original cost be ascertained, but how shall subsequent depreciation in value be reckoned and accounted for?

"In *Knoxville vs Water Company,* 212 U. S. 1, this court had to do with a similar element of depreciation, and, after pointing out that such a plant as was there in question begins to depreciate in value from the moment of its use, and that before coming to the question of profit at all, the company was 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 should come to the end of their life, the court proceeded to say, (p. 14): 'If, however, the company fails to perform this plain duty and to exact sufficient returns to keep the investment unimpaired, whether this is the result of unwarranted dividends upon over-issues of securities, or of omission to exact proper prices for the output, the fault is its own. When,

therefore, a public regulation of its prices comes under question the true value of the property then employed for the purpose of earning a return cannot be enhanced by a consideration of the errors in management which have been committed in the past.' . . .

"It is insisted upon that if the appellant, having expended in round figures $600,000, secured by the sale of bonds for improvements, can be compelled to charge $400,000 of that amount to the operating expense of one year or to distribute it among the operating expenses of a series of years, and if it be forbidden to keep any other record representing the transaction, it will have in its possession no kind of record from which it can report accurately either the cost of its property or the cost of improvements or its operating expense. This, we think, is a misapprehension of the effect of the regulations. They do not require appellant to falsify its books or to change in any way the evidential character of the original entries. The source of the money and the distribution made of it as expended, may and should be correctly shown. The regulations do require that the contemporaneous abandonment of other property be likewise shown, and the replacement cost, less salvage, charged to the appropriate accounts under operating expense. This, if observed, of course, results in enforcing a prescribed distinction between capital expense and operating expense. It does not require that the record of the expenditure be obliterated; but it does of course affect the results as they work out upon the balance sheet. If this be fairly done, *there is no transmutation of new property into operating expenses, but only the insistence upon the requirement that new property added shall not alone be the measure of the accretion to the property account, but that the depletion attributable to contemporaneous abandonment of their property shall likewise be reflected upon the books.*

"The theory upon which the Commission has acted in formulating its regulations is fairly stated in its brief herein as follows: The abandonment of property incident to grade revision is 'depreciation,' and such depreciation is of two kinds—(1) that which is not replaced in kind and (2) that which is replaced by improved materials, track or equipment. If a trunk line of road

has a branch extending into a territory, not served by its main line, and, finding the branch unprofitable, abandon it, taking up the track, without constructing any substitute to serve the same territory, the abandoned branch ceases to be an earning instrumentality; the stockholders can thereafter derive no profit from it; it has served its purpose, and only past operations have benefited from it. So far as the profits of past operations have not been distributed to the stockholders, they are represented in the profit and loss account. and therefore such an abandonment or depreciation is properly chargeable to that account *unless a special depreciation account has been established in anticipation of such abandonments;* and for such an account, provision is made in the regulations. The other kind of depreciation is the result of changes attributable to the inadequacy of the existing property to meet the demands of the future. The road or the structure have to be replaced with stronger or more efficient instrumentalities. *Abandonments occasioned by changes of this character are therefore chargeable to future earnings, for the reason that the improved condition of the road is not only designed to meet the demands of the future, but presumably will result in economies of operation, and so the resulting benefits will be reaped by those who hold stock of the company in the present and in the future. The railroad company may, if it sees fit, anticipate general depreciations, and make provision for them by establishing a reserve for that purpose; but if no such provision has been made the abandonments should be taken care of by charging them to present or future operating expense.* In fact, however, the amount is so large that its inclusion in a carrier's operating expenses for a single year would unduly burden the operating expense account for that year, the carrier may, if so authorized by the commission, distribute the cost throughout a series of years.

"It is further insisted that even the theory upon which the accounting regulations rest does not, when analyzed, justify a charge of abandoned property to operating expenses, but at most a charge to profit and loss. The suggestion apparently has force; but, upon consideration, we are unable to see that it furnishes ground for judicial interference with the course pursued by the

commission. Except for the contention (already disposed of) that the value of the abandoned parcels should be permanently carried in the property account as part of the cost of progress, it is and must be conceded that sooner or later it must be charged against the operating revenue, either past or future, if the integrity of the property accounts is to be maintained; and it becomes a question of policy whether it should be charged *in solido* to profit and loss (an account presumptively representative of past accumulations) or to the operating accounts of the present and future. If abandoned property is not charged off in one way or the other it remains as a permanent inflation of the property accounts, and tends to produce, directly or indirectly, a declaration of dividends out of capital. If it be charged to the surplus account, it tends to prevent the declaration of dividends based upon a supposed accumulation of past earnings. If charged to operating expenses of the current and future years, it has a tendency to prevent the declaration of dividends from current earnings until the amount of the depreciation shall have been made up out of the earnings."

This decision discusses the necessity of a uniform system of accounts under a system of government regulation. The fundamental distinction between capital accounts and operating accounts as brought out may be stated thus:

(*a*) All capital expenditures do not result in permanent property. Depreciation must be reckoned with and accounted for.

(*b*) The cost of progress theory, or as it has been termed in some valuation work "the cost of development of the art" is not admissible to the extent of leaving in property accounts the cost of works built and subsequently abandoned or superseded by more modern works.

(*c*) The accounting methods prescribed by the

Interstate Commerce Commission are approved in so far as they permit the cost of new property to be added to capital, and require that the original cost of property abandoned, less salvage, shall be credited to capital and charged to operating expenses.

(*d*) Obsolescence, "the inadequacy of the existing property to meet the demands of the future," is a charge on future earnings because the improvement is designed to meet the needs of the future, and because it will result in economies, the benefit of which will be reaped by present and future owners.

This case deals clearly with depreciation in the sense of complete loss of value, and does not touch upon any question of the computation of theoretical depreciation or its deduction. The depreciation that is here treated is the complete passing out of useful service of a section of property, and its replacement by a new section in a new location.

Nothing could be more plain than the recognition of the court of the two methods of accounting for depreciation. The road may make provision for general depreciations "by establishing for that purpose," or by charging to operating expenses.

These cases are believed to cover not only all of the most important decisions up to Jan. 1, 1914, but also those earlier ones which are of value as showing the chronological development of the conception of Depreciation.

The decisions of this period, 1909 to 1914, are the important and controlling authority on which both engineers and accountants must base their work.

THIRD PERIOD

1914 to 1922. The Period of War and Fluctuating Prices

Shortly after the beginning of the World War prices of material and labor commenced to increase, and the result was that the utilities, especially those whose rates were fixed by contract, began to ask for relief. Prices increased rapidly after the entry of the United States into the war in 1917, reaching the peak in the autumn of 1920. The issues of "fair value" became acute and the two conceptions of value, that of reproduction at current prices and that of investment were both strongly urged. The subject of depreciation seems to have been considered of secondary importance. The decisions quoted are believed to be the ones which are entitled to greatest weight.

One state court case which is of distinct interest as one of the first, if not the first court case in which there is recognition of the possibility of so maintaining a property that depreciation is made good by replacements, is *Pioneer Telephone and Telegraph Company vs State,* decided by the Supreme Court of Oklahoma, Sept. 25, 1917. Kane, Judge. 167 Pacific, 995:

"(3) Another ground for complaint is based upon the claim that the Corporation Commission refused to allow the company a sufficient reserve for depreciation. *The Commission held that inasmuch as the evidence showed that the physical plant was kept up to a high degree of efficiency by replacements paid for out*

of current revenue, and that any deterioration covered by obsolescence would not affect the result in the case at bar, there was no depreciation, and therefore an allowance for a reserve fund to take care of depreciation was not necessary, and should not be allowed. The contention of the company on this point is that, notwithstanding every part of a properly constructed and well-equipped telephone system may be maintained in good condition from year to year out of the maintenance fund, yet the time inevitably comes with every building and unit of equipment when it can no longer be kept serviceable by repairs or current maintenance, and when it must be replaced substantially in its entirety. Therefore, they say, since the total life expectancy of the parts of the entire plant may be measured in years on something similar to a mortality table basis, unless a depreciation fund is provided for from year to year out of earnings, sufficient to replace the plant substantially in its entirety at the end of each life expectancy period, the dividends paid will before long represent the better part of the stockholders' investment. A great many authorities and opinions of experts are cited by counsel for the company which they say conclusively show the economic necessity for the principle contended for, among which are the following: Pioneer Tel. & Tel. Co. vs Westenhaver, 29 Okl. 429, 118 Pac. 354, 38 L. R. A. (N. S. 1209), State Journal Printing Co. vs Madison Gas & Elec. Co., 4 W. R. C. 501; in re Application of Cumberland Municipal Elec. Lighting Co., 4 W. R. C. 214; Cunningham et al. vs Chippewa Falls Water & L. Co., 5 W. R. C. 302; Puget Sound Elec. Ry. Co. vs Railroad Commission of Washington, 65 Wash. 75, 117 Pac. 739, Ann. Cas. 1913B, 763; People ex rel. Manhattan Ry. Co. vs Woodbury et al., 203 N. Y. 231, 96 N. E. 420; People ex rel. Third Avenue Ry. Co. vs State Board of Tax Commissioners, 136 App. Div. 155, 120 N. Y. Supp. 528.

"The expert opinion relied upon consists of an article by William B. Jackson, entitled, 'Depreciation and Reserve Funds of Electrical Properties,' published in The Electrical Review of May 7, 1910, p. 934, the report of William J. Hagenah in his Investigation of the Chicago Telephone Co., 1910, and in the second volume of Telephony, page 102. After examining such of

these authorities as are available to us, and others on the same subject not cited, we find ourselves unable to agree with counsel in their assumption that the doctrine of depreciation, as contended for by them, meets with the universal approval of the courts and the economists. From our investigation of the problem of depreciation we are convinced that precedent on this question is varying, and that there is also great contrariety of opinion among the heads of public service corporations themselves, some companies believing that their best interests lie in adopting the largest possible depreciation charge and in the consequent accumulation of a permanent fund in the future, whilst others contend that the application of the doctrine amounts to a virtual confiscation of their property. *Without attempting to set out herein our analysis of these discordant views, it is sufficient to say that we have reached the conclusion that in plants of considerable size that have attained their gait, to which class the plant herein is conceded to belong, there is both theoretically and actually a normal condition in which the replacements come along with comparative evenness, and where there can be no possible use for a so-called depreciation fund of any considerable amount.*

"In the case at bar, as we have seen, the Commission made no deduction from the value of the plant on account of depreciation, but allowed returns upon its value as a going concern, kept up to a high degree of efficiency by replacements paid for out of current revenue. There is no principle of public regulation more firmly established than the right of the company to charge in its rate an amount which will enable it to make these replacements, and as investors put their money into public utilities for the sake of the returns they will be able to obtain, if the allowance for replacements is sufficient to keep up a high degree of efficiency and prevent a lowering of the ability of the plant to earn returns, we are unable to perceive the necessity for building up a fund to be used for the purpose of counteracting a purely theoretical depreciation. The theory of the Commission seems to be that charges should be made in rates sufficient to counteract or prevent depreciation by replacements, and that when replacements are thus fully provided for, depreciation is counteracted. We see

no error in this: at least, none of which the appellant company has any just cause to complain." (Italics ours.)

Consolidated Gas Company of New York vs Newton, 267 Fed. 231, District Court, S. D. N. Y. Aug. 4, 1920, Supplemental opinion Aug. 11, 1920. Learned Hand, Judge.

This opinion has been referred to frequently as in it Judge Hand took a most pronounced stand in favor of prices prevailing at the time of inquiry. The discussion of depreciation in this opinion is dstinctly different and is here quoted in full:

"DEPRECIATION

"(3) The defendants insist upon the element of depreciation, based upon an allowance each year of that proportion of the total value which a year bears to the whole life of the plant. The Supreme Court (Knoxville Water Co. vs Knoxville, supra; Minnesota Rate cases, supra) has recognized that some depreciation is a proper element in estimating the 'rate base,' but has not as yet authoritatively settled on what principle it shall be calculated. It seems to me hardly possible in the case at bar to avoid taking a position with regard to that principle.

"If the proper standard for a 'rate base' is the present cost of a substitute plant of equal capacity, as I believe, depreciation can be a function of it only in case the allowance for renewals to the plant under consideration will in the future be greater than that of the assumed standard. If the rates allowed in the future include only an allowance for renewals of a new plant, the company will have to abate something from its normal profits because of its extraordinary renewal charges. Theoretically it makes no difference whether this problem is met by giving the plant a smaller value at present because of its future greater renewal charges, and then allowing a higher rate for renewals, or by giving it its present value, based on capacity, and letting

it bear its extra renewals out of its normal profits. Were the plant sold, the future abnormal renewals would be reflected in the sale price, being discounted at once; but that would be because the parties must at present clear their accounts once and for all. The seller would be unwilling at once to abate from his price, and later to allow the buyer from time to time for his unusual renewals. In the case of a public service company, where the authorities may always require the plant to be kept up to standard, there is an obvious advantage in declining to attempt a repeated adjustment between the actual renewals necessary and normal renewals, as would be necessary if the present prospect of such allowances were now discounted; it is the better practice to allow the plant to bear its own extra renewals and to insist that it shall always be kept up. Therefore it appears that, so far as concerns the future, the age of the plant should not be a function in the 'rate base.'

(3½) On the other hand, in computing the 'rate base' from the original cost, depreciation is of vital consequence. Practical men will prefer to ascertain the cost of a present plant by experience, when they can, rather than by estimate, just as the master here has done. In so arriving at the cost of a present plant of equal capacity, it is clear that the original cost of the plant in question must be abated by depreciation, so far as that is reflected in a loss of capacity. In such a calculation, however, there must figure past renewals as an offset to past depreciation, and, if in fact the capacity has remained the same, depreciation should not be a function of the 'rate base' at all. In such a case the inquiry as to depreciation should be confined to changes in 'price levels.'"

This case was passed upon by the Supreme Court of the United States on March 6, 1922 ——U. S.—— Advance Opinions, April 15, p. 306. Justice McReynolds delivered the opinion. Neither the basis of valuation nor depreciation is discussed, although the opinion quotes from the Master's report, including the following paragraph:

"I think that the complainant company has shown itself, clearly and beyond all reasonable doubt, entitled to relief from the statutory limitation on its rates, but that its rate of return should be calculated, not upon the present high reproduction cost of its property, with or without the deduction of observed or actual depreciation, in whatever manner computed, but upon the actual, reasonable, investment in the property devoted to the service of the complainant's consumers."

The Supreme Court says: "The fundamental question presented for determination was whether the 80 cent rate had been confiscatory under conditions existing during 1918 and 1919 and probably would continue so to be. . . . The Master's report and opinion disclose careful and intelligent consideration of the whole matter. 'Resolving all doubts against the plaintiff,' and using valuations 'pared down unsparingly,' the trial court agreed with the Master's ultimate findings and ruled that to enforce the statute would result in confiscation."

The decree of Judge Hand, while not reversed outright, was materially modified, affirmed and remanded for further proceedings in conformity with this opinion.

It is clear that the Federal decision adds nothing to the final solution while the Supreme Court opinion does not discuss the questions here being considered.

The reasoning of Judge Hand is quoted as a matter of interest.

Nashville Chattanooga and St. Louis Ry. Company vs United States, was a case involving the correctness of the government's computations of the excise tax under section 38 of the Revenue Act of Aug. 5, 1909.

This case was tried twice before the United States Court of Appeals, Sixth Circuit, both decisions being rendered by Judge Knappen.

The first opinion, reported in 249 Fed. 679 contains a statement of the character of questions involving the determination of depreciation:

"We have not overlooked the argument that the ascertainment of the amount of net income, including items deductible for operating expenses, and for losses by property depreciation, involves questions of fact, to be determined upon testimony and inferences therefrom, as to which reasonable minds may well differ. But this does not make their determination exclusively a legislative, as distinguished from a judicial, act. What is a necessary expense of operation and what is a reasonable allowance for property depreciation are ultimately questions of fact, and of no different kind than those which courts are trying every day. The fact that their determination involves personal judgment does not make to the contrary; courts and juries are constantly deciding kindred questions of reasonable care, reasonable cause, reasonable delay, reasonable compensation, and reasonable disbursements, all of which involve the personal judgment of the triers. Such questions are essentially judicial; so far as they involve legal questions, they are absolutely so."

The second opinion, while not in a rate case, goes into the subject of depreciation and is here quoted at length:

Nashville, Chattanooga and Saint Louis Railway Company vs United States, Circuit Court of Appeals, Sixth Circuit. Dec. 7, 1920. 269 Fed. 351. Knappen, Circuit Judge:

"This case is before this court a second time. In substance it is this: In June, 1916, the United States, under the direction of its commissioner of Internal Revenue, brought suit to recover from defendant an excise tax of 1 per cent claimed to be due from it for each of the years 1909 and 1910, under section 38 of the Revenue Act of August 5, 1909 (36 Stat. 11, 112, c. 6),

which makes every corporation to which it applies 'subject to pay annually' a special excise tax of 1 per cent on its net income, to be determined by deducting from gross income, among other things, operating expenses, losses sustained, 'including a reasonable allowance for depreciation of property,' interest on indebtedness, and taxes. The declaration alleged the filing by defendant with the Commissioner of Internal Revenue, on Feb. 25, 1910, and Feb. 21, 1911, respectively, of returns of its net income for the respective years 1909 and 1910; that both returns were incorrect as to the amount of defendant's income—that for 1909, in that it included, as an item of deduction from gross income, an alleged charge of $26,000 to expenses, which was not a necessary expense actually paid out of income in the maintenance and operation of its business and properties; those for both years, in that they included charges to depreciation of roadway, amounting to $249,024.54 for the year 1909 and $239,229.70 for the year 1910, which were not charged against the capital valuation of the roadway on its books, and were not reasonable allowances for depreciation of roadway within the meaning of the act; that the three items named were disallowed by the Commissioner of Internal Revenue and held by him to be incorrectly charged, and that they were in fact not correct and proper deductions from gross income, and that the total amounts so deducted, which should have been included as net income in said returns, were for the year 1909 $275,024.54, and for 1910 $239,229.70; that the defendant was thus indebted to the United States and subject to pay an income tax of 1 per cent upon the amounts stated; that it had failed and refused to make payment; and that the alleged taxes were thus due from defendant and payable by it to the United States."

* * * * *

"Defendant conceded on the trial that the deduction of the $26,000 item in its return for 1909 was not authorized. The court accordingly properly instructed that the government was entitled to a verdict for at least $260 on this account. The substance of the charge otherwise was that the question of fact to be determined was merely whether the deductions made by

defendant in its excise tax reports for the years 1909 and 1910, viz. $249,024.54 for the former year, and $239,229.70 for the latter year, were in whole or in part reasonable allowances for depreciation of roadway during those respective years; that if such allowances were reasonable the government is not entitled to recover; that if they were not reasonable the government was entitled to verdict for 1 per cent of the amounts improperly deducted. The jury was specifically instructed to consider, first, 'the depreciation, either physical or functional, in the value of those parts of the roadway which have not been repaired or renewed or replaced'; and, second, 'what has been the effect of the repairs, renewals, and replacements that have been made to other parts, and determine whether, after you strike a final balance at the end of the year, the roadway is of greater or less value, or of equal value, than or to that which it was at the beginning of the year,' and that if it should be found 'that the value of the roadway, its actual value, is as great at the end of the year, after these repairs and replacements have been made for which credit has been given as an expense deduction, then there is no depreciation in value of . . . the roadway, within the meaning of the statute,' but that 'if, after making such repairs, replacements, and renewals in the different units of the roadway, it should be found that some parts have been made more valuable by the putting in of new parts in place of wornout parts, yet the depreciation in the rest of the roadway, in the deterioration, obsolescence, etc., of other units which have not been changed, and so little done in repairing and replacing that at the end of the year, taking it as a whole, the depreciation in value has exceeded the repairs, replacements, and renewals, so that it is worth less than it was . . . to that extent the railway is entitled to a deduction of 1 per cent.'

"The first specific criticism to the charge is that depreciation was made to depend upon the relative value of the roadway 'in dollars and cents' at the beginning and end of the respective years. The contention is that the criterion is 'earning power,' 'value for use,' not its value to an investor. In point of fact, the court did not use the expression 'dollars and cents' in its charge to the jury. Its various expressions were 'value,' 'net value,'

'actual value,' 'real value,' doubtless meaning intrinsic value, value in 'dollars and cents,' as distinguished from market value, which defendant's testimony showed might be affected by considerations other than intrinsic value.

"The criticism is without merit. Not only is it clear that market value was not meant, but *the criticism loses all point through the specific admission of defendant's counsel, made upon the trial, that 'the road as a whole, for the purpose of carrying on the business of a common carrier, was just as valuable at the end of the year as at the beginning,'* and by the equally express admission of defendant's chief engineer, not only to the same effect as that of counsel, but, further, that it would be worth as much to 'any persons that wanted to buy it for a railroad.'

"The further criticism is made that 'the court refused to permit the jury to consider depreciation, physical or functional, in the units constituting roadway, track, and structures'; the argument being that, as *'a railroad is a composite property,* it is impossible to figure depreciation of a road as a whole without first considering depreciation of the units.'

"The court, however, did not instruct that depreciation of units could not be considered in determining the ultimate question whether there was not depreciation in the roadway as a whole. *It is true that, after stating that there would be no depreciation if repairs, renewals, and replacements had placed the roadway in the same value as at the beginning of the year, it was said:*

" 'In that sense you should not consider each of the individual units that enter into the roadway.'

"But the meaning of that statement was made clear by the paragraph immediately following:

" 'It was not intended to have a system of bookkeeping with reference to each particular cross-tie or each particular rail, *but you should look to the value of the roadway as a whole, comparing its value at the beginning of the year with its value at the end of the year.'*

"Further evidence of the meaning of the charge appears from the later use of the term 'net value'; also by earlier reference to the making of repairs, renewals, and replacements in the roadway, by 'taking out units that had decayed or whose usefulness

was at an end and putting in others, taking out cross-ties, decayed cross-ties, worthless cross-ties, and putting in new cross-ties, taking out rails worn out and putting in new rails, repairing and replacing different units in its roadway system from time to time,' as well as by the instruction that the jury should consider 'depreciation, either physical or functional, in the value of those parts of the roadway which have not been repaired or renewed or replaced, then also consider what has been the effect of the repairs, renewals, and replacements that have been made to other parts, and determine whether, after you strike a final balance at the end of the year, the roadway is of greater or less value, or of equal value, than or to that which it was at the beginning of the year.'

"The contention on which defendant seems to rest its chief criticism seems to be that, notwithstanding the roadway as a whole was intrinsically just as valuable at the end of the year as at the beginning of the year; that is to say, although depreciation in given units had been fully overcome by appreciation in others, the railway company would still be entitled to credit for depreciation in such individual units as had depreciated. We think this contention of defendant not sustained by reason or authority, and that the court correctly charged the true criterion. If, as is not entirely clear, it is meant to further suggest that the consideration of functional (as distinguished from physical) depreciation was not allowed by the charge to be taken into account, the suggestion is plainly without merit. Not only did the court define the roadway as including 'structures connected with the roadway, such as stations, toolhouses, and matters of that sort,' but it included in depreciation a lessening of original values 'due to wear and tear, decay, gradual decline from obsolescence—that is, getting out of date and inadequacy.' *In our opinion the jury was given the correct rule for determining the existence or non-existence of depreciation, which accords with the 'ordinary and usual sense' of that term 'as understood by business men.'* Van Baumbach vs Sargeant Land Company, 242 U. S. 503, 524, 37 Sup. Ct. 201, 61 L. Ed. 460. *To say that property can depreciate without impairment of either intrinsic value or efficiency is to our minds a solecism.*

"3. *The Refusal to Direct Verdict.*—The sole question in this regard is whether or not there was substantial testimony tending to support the government's contention that there was during the years 1909 and 1910 no net depreciation in the intrinsic value of the roadway and structures considered as a unit. It is not highly important to the determination of this question whether the controversy arose on one theory and was tried on another, nor whether the claimed depreciation would have been allowed under the system of bookkeeping employed by the government, had the charges therefor been set up on the railway company's books, 249 Fed. at page 686, 161 C. C. A. 588.

"It appears that defendant arrived at the depreciation charges by estimating the value of the perishable structures as one-third the cost of the road (less equipment and real estate), and then taking 3 per cent of this one-third value, on the theory that the average life of the various perishable elements was 33⅓ years. Whether or not these depreciation estimates were reasonable was a question for the jury.

"In our opinion there was substantial testimony tending to support the government's contention. It appeared that there was expended in round numbers for maintenance of way and structures—that is to say, for repairs, renewals and replacements—for the year 1909 of $1,600,000, and for the year 1910 of $1,554,000, and that no substantial part of these sums was carried in defendant's accounting as additions and betterments. It was admitted by defendant's chief engineer that the expenditures for 1909 'kept the road in a normal condition to carry on its business,' that 'its normal condition was a good condition,' and that the expenditures 'had made good the normal amount of depreciation.' *There was testimony by competent witnesses of railway experience that 'there may be depreciation in the units comprising the roadway, track and structures of the railroad, while there is no depreciation in the machine as a whole'; also that 'it is possible to maintain the roadway, track, and structures, so that there will be no depreciation if we consider the roadway, track, and structures as a composite whole'; also that 'the service life of any normally operated and normally and well maintained railroad is*

perpetual, and it is maintained in the condition of property serving its purpose by annual renewals and replacements.'

"The testimony, considered as a whole, tended to support the conclusion that the amounts expended by defendant during the years in question for repairs, renewals, and replacements should and would have fully offset the depreciation in the various units, and that the defendant's railway and structures were, as a whole, maintained throughout the years in question in fully as good condition, and were of fully as great intrinsic value, as at the beginning of the respective years. The jury would have been clearly justified in inferring from the testimony of defendant's chief engineer, taken as a whole, that the value of the roadway had not depreciated during the two years in question; in other words, that the repairs and renewals that had been made were of such a character as to leave the road at the end of each year of value equal to that at the beginning of the year. That officer's testimony so impressed the trial judge, who stated his opinion from the evidence that 'there is no reasonable deduction for depreciation established.' Defendant did not directly controvert the situation so shown. Its chief, if not its only, reliance seems to have been on the proposition that, in spite of it all, there was inevitable annual depreciation in some of the perishable elements not entirely renewed or replaced, so justifying the contention that for this reason there was depreciation within the meaning of the act, even though the roadway as a whole had not decreased in value. *To this argument, as rightly said, we cannot assent.* It follows that the trial judge rightfully refused to instruct verdict for defendant.

Finding no error in the record, the judgment of the District Court is affirmed. (Italics ours.)

The Queens County Gas case is of special interest in view of the thorough discussion of depreciation by the master. The approval of the master's findings by the District Court, and the affirmation of that decree by the Supreme Court seem to entitle this report to most careful consideration.

New York and Queens Gas Company vs Newton 269 Fed. 277. District Court C. D. New York, Dec. 13, 1920. Mayer, Dist. Judge.

The opinion of the court in this case is very brief and only touches upon one or two subjects not including depreciation. He approves the report of Special Master Abraham S. Gilbert as follows:

"Examining, then, this record and the special master's report, it is apparent that discussion is necessary only in respect of the more important features. Many of the details have been carefully and correctly disposed of by the master in his comprehensive report, which fully, though concisely, has dealt with the essential features of the testimony. Repetition, in this opinion, of certain findings and of the reasons in support thereof is not requisite, and it is enough to indicate approval of those findings."

The report of the special master deals with the subject of depreciation in the following language:

"*No Reduction for 'Accrued Theoretical Depreciation.'*—In determining that the complainant's property has a fair present value of at least the amount of the complainant's actual investment therein as found by me, viz. at least $1,655,887.94, I have made no deduction for what is termed 'depreciation,' in whatever way calculated. Under any basis of determining present value, the complainant's property is now worth at least the amount of such investment therein, and the sound rule of law and policy seems to require the allowance of a reasonable return upon at least that sum.

"Upon the present trial, it was insistently urged upon me by some of the defendants that there should be deducted from the cost of the property (irrespective of whether 'original,' 'pre-war,' or 'present reproduction' cost be under consideration) an amount claimed to represent so-called 'accrued theoretical depreciation,' based upon an assumption of 'life expectancy' for a gas plant and

equipment and the estimated or known number of years since the same was erected or installed. *From the testimony given upon the trial, I was strongly impressed that, in respect of a very large proportion of gas property, there is no ascertainable 'life expectancy.'* The withdrawal of such property from service comes about from inadequacy or obsolescence, which cannot be forecast in terms of years or even satisfactorily guessed at. Certain parts of operating machinery and equipment are of course subject to the effects of use. The replacement of these wearing parts enters into the cost of repairs. As to the substantial units of structures, apparatus, mains, and equipment, their withdrawal from the property accounts comes about from causes not attributable to the condition of the property itself, or any diminution in its operating efficiency, but varying utterly with the particular plant, time, local conditions and service demands, and hence capable of being forecast only as the occasion for such change in plant or equipment becomes imminent.

"The Renewal and Replacement of Gas Property.—In other words, in order to keep abreast of improvements in the art of making and distributing gas when and as it becomes economically advantageous to do so, and to meet the growing demand of the public for service more adequately and economically than would be possible through merely making additions and extensions to existing plant and equipment, larger or better and more economical and efficient units of plant and equipment are from time to time installed, to take the place of units which are still operating as efficiently as when first installed. *The loss due to such supersession cannot properly be said to have accrued during the period the superseded unit was in service. It occurred when supersession took place. It became a proper charge against the economies to be realized therefrom. It furnished no basis for the imposition of an additional charge against the user of the superseded unit during the period of its useful service, over and above the higher cost of operating it. Such a charge could not be justified, either on the ground that the unit was losing potential life, or that the capital invested in it was being consumed, because neither is true.*

"Additional Burden on the Consumer Unwarranted.—In order to justify the deduction of 'theoretical depreciation,' I was asked

in this case to assume that 'a depreciation reserve' equal to the computed 'theoretical depreciation' had been collected from the public, and then to deduct from the company's investment the amount of such assumed reserve. No such reserve had, in fact, been collected or accumulated by this company. The rate chargeable did not permit it, and there is no reason to believe that the Legislature, in prescribing the rate, ever contemplated it. *As I have set forth in findings Nos. 32 and 27 of my report, and as I have elsewhere indicated herein, the complainant gas company has maintained its property and investment intact in the past, through renewals and replacements, at an average actual cost of approximately .3 cents per 1000 cubic feet of gas sold, and no reason appears for believing that it cannot continue to do so on that basis.* Even assuming that the statute permitted such a rate, to have imposed on the company's consumers an additional burden nearly twice as great, representing a purely theoretical item of operating cost, merely to accumulate a useless reserve to justify a drastic deduction from investment in some ultimate proceeding as to rates, could not have been justified on any sound theory in the past, and cannot now be sustained as to the future.

"*Effects of an Unnecessary Reserve.*—In order to justify the assumption that a 'depreciation reserve' was or should have been collected, defendants' witness Hine testified in this case that such a reserve was necessary, 'so that when the property is retired for any cause whatsoever the fund can be charged with the cost of the property.' He testified, also, that the reserve should be in his opinion 'invested in the property,' and that when the funds were needed for renewals and replacements they would be provided 'by issuing securities against construction work which had been done originally out of this fund, for the money laid aside for this fund, just to reimburse the treasury on account of these expenditures.' This view seemed to me to disregard the obvious fact that, having deducted the amount of the reserve temporarily invested in property from that on which he proposed the company should be allowed to earn a return, he, to all intents and purposes, destroyed the earning power of such property, and investment; that therefore he could not issue any securities against such property, there being no earnings therefrom with which to pay

interest on the securities; that the reserve could never thereafter be availed of for the purpose for which it was alleged to have been created; and that it would be, in fact, as if it had never been created. Thus he not only failed to sustain his contention that a 'depreciation reserve' was necessary for the purpose which he alleged, but he proposed to treat the reserve as if he himself believed it to be both unnecessary and ineffectual, except for the purpose of justifying a deduction from the complainant's investment.

"It is obvious that the collection of an unnecessary reserve and its periodic deduction from the value of the property in service would operate to effect a piecemeal purchase, on the part of the public, of the property used by the utility in its service. In other words, it is really asking the consumer to pay for the plant, instead of paying a return on the investment. If such a consummation is desirable, of which there is no evidence, it should be effected openly, and not surreptitiously, under the guise of providing for so-called 'theoretical depreciation.'

"*Present Condition of the Property.*—Mr. Miller testified that, as of April, 1920, the expenditure of $6,144.07 for repairs, renewals, and replacements, would put the plant, structures, machinery, and equipment in condition substantially as good as when they were erected or installed. His testimony in this respect was not contradicted by that of any witness. This sum, however, does not, in my opinion, measure any impairment in the present value of the property used and useful in the gas business. It represents merely an unmatured obligation to maintain the property in efficient operating condition out of future earnings; the expert witnesses of both the complainant and the defendants agreeing that it was and is maintained in efficient and first-class condition. I therefore have not deducted this or any other sum representing so-called 'accrued depreciation' from the amount found by me to represent the investment of the complainant in its gas property upon which it is entitled to have its rate such as to yield a reasonable return."

Inasmuch as the Federal Court quotes the Master's report in full and accepts it, so far as it re-

lates to depreciation, without comment or modification, the final acceptance of this decree by the Supreme Court on review of the case entitles it to great weight.

Newton vs New York and Queens Gas Company, decided March 6, 1922, U. S., Advance Opinions, April 15, p. 309. Opinion by Justice McReynolds.

The opinion is short, only two paragraphs. The second refers to the Master's report and conclusion that the rate was confiscatory, and says:

"With this conclusion the trial court agreed, and entered an appropriate decree. We find no sufficient ground for disapproving the action so taken, and it is accordingly affirmed."

The case of *Galveston Electric Company vs City of Galveston* tried before the District Court, S. D. Texas, Feb. 10, 1921, reported in 272 Fed. on p. 147, and affirmed by the United States Supreme Court in *Galveston Electric Company vs Galveston,* decided April 10, 1922, reported in Advance Opinions, May 15, 1922, constitutes the last word spoken by the Supreme Court on the subjects of Valuation and Depreciation.

The Federal decision was rendered by District Judge Hutcheson. In passing on the motion for rehearing, April 27, 1921, he discusses depreciation on pp. 168 to 171 as follows:

"The record shows that the overheads, such as interest during construction, engineering, law expenses, etc., were arrived at by the parties by taking a certain percentage upon the estimated cost of the physical properties. It must necessarily follow, then, that,

if the physical properties entering into the cost of the property are appreciated, the overhead items will be correspondingly increased, as the necessary result of applying the same percentage figures to the increased amount of money involved. Or, putting it otherwise, for the purpose of this calculation, the synthetic process is employed, and the overheads are not treated as distinct items, but as parts of a complete whole, and while I do not find that the items of overhead, such as interest during construction, have appreciated in cost, or that, viewed as items apart from the physical property, there should be any appreciation applied to them, I do find that, when the base which is used to find the amount of these items by the application of percentage is increased, the sum of these items must necessarily itself increase.

"On the other hand, when the matter of establishing the depreciation annuity is considered, the analytic process is employed, and the sum total of the value of the plant is resolved into its constituent items, so as to select those items making up the whole which are susceptible to depreciation. Under the influence of this process it is clear that the overhead items must be discarded in arriving at the annual depreciation allowance.

"That this disposition is sound as to such items as interest during construction, organization expense, law expense, etc., admits of no doubt, because under no kind of theory could they be supposed to be subject to depreciation, and what doubt might arise with reference to the propriety of including engineering charges in these figures is at once dissipated when it is considered that the property will not be constructed again as an entirety, but is to be kept up by annual renewals from time to time made, so that engineering, and other such overheads caused by the assembling of the plant, will not have to be provided against, because they will not be again incurred.

"In short, while, if the object of the depreciation annuity were to provide a fund sufficient at the end of a period of years to replace the plant as an entirety, the percentage ought to be figured on the entire cost of the plant, including the overheads necessarily incurred in assembling it, since the object is otherwise, and merely contemplates the provision of a fund out of which annual renewals and replacements can be made, none of these

items ought to be considered in arriving at the annuity rate, for the same organization which runs the plant, the expense of which is provided for in the annual operating expenses, looks after, provides for, and takes care of the renewals.

"The result of these views requires the complete rejection by the court of the figure of $1,300,000, taken in the original opinion as the basis for the 4 per cent depreciation annuity, and the substitution therefor of the correct figure, $1,000,000, which is arrived at in accordance with these views, to which must be added $131,000 of new physical items overlooked by the court in the former opinion, making a total figure for the basis of depreciation allowance of $1,131,000.

"MAINTENANCE

"In the original opinion the excessive increases in maintenance over the year 1918 were disallowed by the court, and it was stated that an allowance of $70,000 on that score would be liberal. The arguments on the motion for rehearing have not changed, but have confirmed, that view.

"While the data before the court did not permit of the absolute deduction, the court was of the opinion that the excessive advances in maintenance were explained by the fact that maintenance had been confused with depreciation or replacement account, and that the shadowy difference between depreciation and maintenance, which exists in some classes of expenditure, had disappeared, with the result that the company was charging to maintenance items which ought to have been taken care of in replacement or depreciation account. I was led to this conclusion by the fact that, while maintenance costs were mounting higher and higher, the operating costs did not correspondingly increase.

"Counsel for complainant lay the difficulty at the door of what they call 'deferred maintenance,' and claim that, unless they are now allowed a sufficient return to take care of this deferred maintenance, it must come out of the stockholders, which they claim is unjust. To this position the answer suggests itself that, as to

maintenance and depreciation, in paraphrase of John Dryden, it may be said:

> 'Maintenance is sure to depreciation near allied,
> And thin partition walls their bounds divide,'

and that if this maintenance has been deferred as much and as long as they claim, it has by this time become depreciation, and the total of the sums of deferred maintenance might with propriety be subtracted from the valuation of the property, because the money represented in those figures is either in the property or is not in it, and this valuation has assumed that the company's property was in proper repair.

"I am inclined, however, to the view that the disposition of this item by deducting these sums from the capital value would not be accurate or just, and that the proper disposition of it is to treat it as what the company in fact claims it is, deferred maintenance, at least until such time as the company has had an opportunity to restore the property to its proper operative condition, by putting into it the 'deferred' maintenance called for by their own figures.

"Upon no view of it should the public be required to pay such rates as would permit the company, at the public's expense, to re-establish its property in the condition it ought to have been maintained in. The language of the Supreme Court in the Knoxville Water Co. case has application here:

" 'If however, a company fails to perform this plain duty, and to exact sufficient returns to keep the investment unimpaired, whether this is the result of unwarranted dividends upon over-issues of securities, or of omission to exact proper prices for the output, the fault is its own.'

"For there can be no difference between the effort to increase the *value of the property* through a recital of past failures to make replacements, and the effort to *increase the rate of return* in order to put back into the treasury moneys to take care of deferred maintenance. I am convinced, therefore, that, whether this excess maintenance is due to confusing maintenance with replacement cost, or to a condition of 'deferred maintenance,' the

so-called 'actual' maintenance expenditure cannot be allowed in determining whether the rate is confiscatory, but there should be taken an annual sum, arrived at upon a consideration of all the factors which enter into the problem, in the light of the history of the company, and in that light I have allowed $70,000, which seems to me to be at present ample, and which, if prices continue to fall, will soon become itself excessive."

The Supreme Court decision, April 10, 1922, reported in Advance Opinions, May 15, p. 383, by Justice Brandeis says, bearing on this subject:

"The company asked to have allowed as a further charge $29,500 a year on account of what is called deferred maintenance. The contention is that during the war and two years following, the company had deferred maintenance, pursuant to a policy established at the express request of the government to the end that material and labor might be released for war purposes; that to make good this deferred maintenance would cost $197,000; and that, in order to amortize this amount, an annual allowance from earnings of $29,500 should be made for five years. This is an attempt, in another form, to capitalize alleged past losses; and the request was properly refused both by the master and the court."

THE END

TABLE OF CASES AND REFERENCES