

1936

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Lewis W. Roberts, *Depreciation as an Element in Public Utility Valuation*, 1 Mo. L. REV. (1936)
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Depreciation as an Element in Public Utility Valuation

W. LEWIS ROBERTS*

One entering upon a discussion of any rate-making problem, might well heed the injunction found in Dante's *Inferno*, "Abandon hope, all ye who enter here." The landmark decision in rate-making, *Smythe v. Ames*,¹ made no mention of depreciation as an element to be considered in getting at the "fair value" of the property of a public utility for rate-making purposes. Mr. Justice Harlan stated that "the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stocks, the present as compared with the original cost of construction, the probable earning capacity of the property under the particular rates prescribed by statute, and the sum required to meet operating expenses" were matters for consideration. It was not until the United States Supreme Court was considering the case of *Knoxville v. Knoxville Water Co.*² that mention was made by that court of depreciation as something to be taken into account in rate-making.

The importance of making allowance for depreciation, not only in public utility problems, but in corporation and business ventures generally, has not been very carefully considered in the past. Neither the lawyer, the economist, nor the business man for that matter, has given it the attention that it deserves. Stockholders often wake up to find that their entire investment has disappeared because no allowance had been made for depreciation. As we drive along our state and national highways we are constantly seeing abandoned road beds of interurban and steam railways, which in many, if not in most cases are all that remain of many an investor's hopes because no provision was made for depreciation to protect against loss through obsolescence. Today much coal is being hauled by trucks from mine to consumer and sold at prices that give the truckman a bare living but make no provision for replacing his truck when it is worn out. In the meantime the regular coal operators and railroads are being injured by this competition which they cannot meet if they make proper allowance for depreciation. Depreciation, also, plays an important part in the computation of income taxes today. It is interesting to note the space that is given it in the latest publication of the United States Treasury Department on income tax—Regulations 86.

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1. 169 U. S. 466 (1897).

2. 212 U. S. 1 (1909).

In the *Knoxville* case the court said that a plant begins to depreciate in value from the moment of its use. Before considering the question of profits, the court stated, the company was entitled to earn annually a sum that would not only take care of current repairs but also of the depreciation and replacing of parts of the property when they were worn out; that the company was entitled to keep its original investment unimpaired. Furthermore, the court made it clear that since the rate of return was to be based upon the true value of the property at the time the rate was fixed, consideration could not be given the fact that allowance had not been made for depreciation in the past. We have, then, these propositions laid down at the outset: public utility plants depreciate from the start; this loss in value is part of the expense of carrying on the business; it is the duty of the management to keep the investment unimpaired by charging this depreciation to the expense of operation; and if it is not charged in at the time it accrues, it cannot later be considered in fixing the amount of return to be allowed. Mr. Justice Moody said that the cost of reproduction was one way of ascertaining the present value of the plant provided this cost be diminished by the depreciation which had come from age and use.

Depreciation according to Webster, is a reduction or loss in exchange value or purchasing power. It has elsewhere been defined as "the act or state of lessening the worth of any physical factor constituting property, caused by weather, time and use."³ The president of the Wisconsin Telephone Company, Mr. Alonzo Burt, in testifying before the commission of Wisconsin, gave a definition that is more illuminating for our purposes. He said that depreciation is the allowance that must be made for the replacing of apparatus on account of wear and tear, on account of unforeseen changes in the state of the art, or on account of increase in the traffic which outgrows the equipment and necessitates its replacement by larger and more adequate apparatus.⁴ The Interstate Commerce Commission defines depreciation as "the loss in service value not restored by current maintenance and incurred in connection with the consumption or prospective retirement of property in the course of service from causes against which the carrier is not protected by insurance, which are known to be in current operation, and whose effect can be forecast with a reasonable approach to accuracy."⁵ One should bear in mind that the term is used in at least two senses in cases dealing with public utility problems,—to indicate a lessening in value caused by wear and tear and also to designate the provision made to take care of depreciation. The first is the more accurate use of the term.⁶ Pond puts it in a little different way. He says that "there are two kinds of depreciation, that due to the ordinary physical wear of operation

3. 52 L. R. A. (N. S.) 18.

4. *Payne v. Wisconsin Telephone Co.*, 4 WIS. R. C. R. 1 (1909).

5. 177 I. C. C. 422.

6. Guernsey, *Some Depreciation Questions* (1930) 4 TEMPLE U. L. Q. 203, 206.

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and that resulting from functional depreciation which results from the necessary replacement of equipment before it is worn out by invention and improved appliances which render more efficient and satisfactory service.”⁷

A perusal of the cases soon reveals the fact that the courts refer to different kinds of depreciation. In the leading case on the subject, *Knoxville v. Knoxville Water Company*,⁸ for instance, we find the justice who wrote the opinion talking about “complete” and “incomplete” depreciation. “The complete depreciation,” he said, “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.”

Not only is the term depreciation used in the ways named, but we find the courts speaking of different kinds of depreciation. We find accrued, realized, annual, theoretical, actual or observed, and functional depreciation, mentioned in the cases. Mr. Justice Page in his opinion in *Indiana Bell Telephone Co. v. Pub. Service Comm.*⁹ says that the “accrued depreciation” has been defined in that case as the average of the consumption of property, and “realized depreciation” as that consumption of property which has come to pass by retirement. A clearer definition of accrued depreciation is to be found in a leading casebook on public utilities, “the amount of value which the property has lost in the *past*—or the difference between its ‘brand new’ and ‘present fair’ value.”¹⁰ In the case of realized depreciation upon the retirement of the property, it is pointed out by Mr. Justice Page, that there is usually some salvage in the property retired, “and the ‘net realized depreciation’ is that depreciation which remains after deducting the amount of the salvage.”¹¹ To repeat, realized depreciation is said to take place where a machine or unit is completely worn out or completely unsuited for further service and is therefore discarded.

The allowance charged by a utility against its operating expense in order to build up a reserve for future retirement of property consumed in public service, is called annual depreciation. Chief Justice Hughes in a recent case said: “Annual depreciation is the loss which takes place in a year. In determining reasonable rates for supplying public service, it is proper to include in the operating expenses, that is, in the cost of producing the service, an allowance for consumption of capital in order to maintain the integrity of the investment in the service rendered.”¹²

7. 2 POND, PUBLIC UTILITIES (4th ed. 1932) § 577.

8. 212 U. S. 1 (1909), cited note 2, *supra*.

9. 300 Fed. 190, 198 (D. C. Ind. 1924).

10. WELCH, CASES ON PUBLIC UTILITY REGULATION (1932) 493.

11. *Indiana Bell Telephone Co. v. Pub. Service Comm.*, 300 Fed. 190, 198 (D. C. Ind. 1924), cited note 9, *supra*.

12. *Lindheimer v. Illinois Bell Telephone Co.*, 292 U. S. 151, 167 (1933).

"The term "theoretical depreciation" refers rather to a method of arriving at the depreciation that has taken place than to a type of depreciation. It is calculated by means of a life table based on a study of the average life of millions of dollars' worth of equipment. It is not unlike the life tables used by insurance companies to estimate the life expectancy of an insured. In the case of theoretical depreciation, of course, the object is to estimate the amount of wear and tear that has already taken place and not to estimate the life expectancy of the piece of equipment.¹³

The terms "actual" and "observed" seem at first glance to be almost self-explanatory. Actual depreciation is used to designate the loss in value through wear, tear and obsolescence which the property in question undergoes. Observed depreciation would be that shown by an inspection of the object. The two are pointed out in *In re Union Electric Company*,¹⁴ where it is said: "We do not read the *Indianapolis Water Case*, *supra*, nor the *Pacific Telephone & Telegraph Case*, *supra*, nor any of the cases cited in either decision as upholding the view that actual depreciation not visible to the naked eye upon an inspection of the property is to be wholly ignored. What they hold in effect, as we view them, is that actual depreciation and not theoretical depreciation is to be deducted and that in arriving at the deduction recourse must be had to opinion based upon contemporary investigation." One writer on the subject regards "actual" and "observed" depreciation as one and the same thing. He says: "Actual or 'observed' depreciation is the diminution in value of the actual property, as compared with the value of perfectly new property, due to physical condition and to any obsolescence and inadequacy which is apparent. It represents the difference between what a capable and intelligent manager, obliged to furnish the service in question would pay for perfectly new property and what he would pay for the property in question."¹⁵

"Functional" depreciation is the loss that accrues from the "necessary replacement of equipment before it is worn out, by invention and improved appliances which render more efficient and satisfactory service."¹⁶ The United States Supreme Court has pointed out that the determination of functional depreciation is a very serious task, far more so than the determination of physical depreciation.¹⁷

Depreciation is not a form of insurance. Counsel for the city of Chicago in a hearing before a commission, pointed out that depreciation should not include losses from extraordinary casualties. Depreciation, he argued, "should be regarded as current and gradual consumption of service value from present-

13. L. R. A. 1916 F, 765.

14. P. U. R. 1928 E, 396, 415.

15. Hasbrouck, *When shall Depreciation be Deducted to Find the Rate-Making Value of Public Utilities* (1925) 10 CORN. L. Q. 471, 482.

16. 2 POND, *op. cit. supra* note 7.

17. *St. Louis & O'Fallon R. Co. v. United States*, 279 U. S. 461, 534 (1929).

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ly ascertainable causes."¹⁸ "The function of insurance," says Commissioner Eastman, "on the other hand, is to afford protection against possible contingencies which cannot be foreseen and which may or may not even occur."¹⁹ The purpose of a depreciation charge is to keep the investment unimpaired. As Mr. Justice Moody well put it: "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 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."²⁰

METHODS OF COMPUTING DEPRECIATION

There are several methods of computing depreciation. Mr. Justice Brandeis, in a note to his dissenting opinion in *Southwestern Bell Telephone Co. v. Public Service Comm.*²¹ enumerates five methods: (1) The replacement method; (2) the straight-line method; (3) the compound-interest method; (4) the sinking-fund method; and (5) the unit-cost method. We find mention made elsewhere of a sixth method, the observation or inspection method,²² and also a seventh, the curved-line method.²³

In the replacement method the full value of the unit worn out or replaced is charged to the costs of the year in which such replacement is made. No annual charge is provided for the purpose of meeting these expenses. In a large plant or railroad these replacement costs would tend to be fairly uniform from year to year. It is in the small plant that they would cause extraordinary costs only occasionally.²⁴

The straight-line method is the method approved by the Interstate Commerce Commission and also has received due consideration in the cases.²⁵ In this method the annual depreciation is found by dividing the estimated service value by the number of years that it is estimated the article will serve, that is the service value is divided by the service life. Where a machine costs a thousand dollars and it is estimated that it will serve for ten years, the annual

18. 118 I. C. C. 340 (1926).

19. *Id.* at 341.

20. *Knoxville v. Knoxville Water Co.*, 212 U. S. 1, 13, 14 (1909).

21. 262 U. S. 276 (1923).

22. Navjohs, *Depreciation as a Factor in Rate-Making* (1931) 11 B. U. L. REV. 164, 189.

23. Coffman, *The Meaning and Ascertainment of "Value" of Public Utilities* (1930) 15 IOWA L. REV. 401, 420.

24. For a good discussion of the various methods of computing depreciation, see Wright, *Methods of Estimating Depreciation in Valuation of Public Utilities for Rate-Making Purposes* (1916) 5 CALIF. L. REV. 1.

25. 177 I. C. C. 408, 413 (1931).

depreciation will be a hundred dollars a year. Mr. Chief Justice Hughes, in the recent case of *Lindheimer v. Illinois Bell Telephone Co.*²⁶ said: "The method is designed to spread evenly over the service life of the property the loss which is realized when the property is ultimately retired from service. According to the principle of this accounting practice, the loss is computed upon the actual cost of the property as entered upon the books, less the expected salvage, and the amount charged each year is one year's pro rata share of the total amount." The "straight-line" method is based upon the age and estimated useful life of the unit.

The "compound interest" method is also referred to as the "annuity method."²⁷ This method has been urged by the committee on valuation of the American Society of Civil Engineers,²⁸ but seems to have had little or no practical application in law cases. By this method it is sought to establish a uniform annual amount to cover an appropriate annual reservation from income caused by depreciation and also a fair return on this value. To use the illustration given by Commissioner Eastman,²⁹ taking the value of the property to be at the outset as one thousand dollars, with no salvage at retirement and a service life of ten years, assume an interest rate of six per cent, the annual amount required, he says, will be \$135.87. The reserve for depreciation for the first year will be \$75.87, and thereafter increase annually until it becomes \$128.18 at the final year. The aggregate of these amounts for the ten years will be \$1,000. The remainder of the \$135.87 is the fair return which decreases as the depreciation reserve increases.

Under the sinking-fund method the annual depreciation charges are so fixed that together with compound interest on the same they will produce the value of the property at the end of its service life. Under the plan usually followed the annual charges are uniform. If the property is worth \$1,000 and has a service life of ten years with no salvage value at the end of that time and the interest rate is six per cent compounded annually, the annual charge of \$75.87 will be required to produce the thousand dollars at the end of the ten year period. Sinking fund tables are used in calculating the annual charge. The interest goes to make up the amount needed at the end of the period. The public served pays only the amount fixed as the annual charge and not the interest, hence in the case of the sinking fund method the cost to the consumer is smaller than in the case of the straight-line method. Furthermore, in the case of the sinking-fund method, in theory at least, the investor does not derive benefit from the fund until the end of the period, in practice, however, the money may be used for capital purposes, for new additions to the plant, if need be. The whole matter then becomes one of bookkeeping. This method

26. 292 U. S. 151, 167 (1933).

27. 177 I. C. C. 409 (1931).

28. 81 TRANSACTIONS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS, 1311.

29. 177 I. C. C. 409 (1931).

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requires in addition to the regular setting aside of the annuities, that the amounts be not varied and that the payments run for the period for the estimated life only.³⁰ The straight-line method, which is as much used as the sinking-fund method, has the advantage of being simpler to apply.

The writers of a recently published work on public utility valuation refer to the "over-all" method as being used in arriving at the amount to be allowed for depreciation of a plant.³¹ This is apparently what is sometimes called the "unit" method. This so-called "over-all" method makes use of the straight-line method but instead of making estimates of the individual units of the plant, an estimate is made on the plant as a unit or as a whole.

Under the observation or inspection method, competent valuation engineers measure the amount of the depreciation by an inspection of the plant.³² The court in the case of *United Fuel Gas Co. v. Railroad Comm.*³³ expressed its belief that this method of estimating depreciation of a physical plant was to be preferred to theoretical opinions as to what the condition of the plant should be, in view of its age and previous use. The objection usually raised against this method is that estimates of the experts show a wide variation, especially where the experts represent opposing interests. Mr. Justice Snow of the New Hampshire Supreme Court suggested that the results in the case before the court showed that the Commission was led to the "irresistible conclusion that each [expert] was not unmindful of his client's interest."³⁴ The same can be said of any expert testimony and possibly of a great deal that is not expert. The same is true of medical experts, or of lawyers and even of some judges. As pointed out by one writer, no practical business man who was considering the purchase of a plant, would think of calculating the amount he should pay for it by computing the amount of depreciation by any one of the methods already suggested. He would make use of the observation method.³⁵

The curved-line method is but another name for the sinking-fund method, of which there are many variations. The Commissioner in *Beloit v. Beloit Water, Gas & E. Co.*³⁶ said: "There is, of course, no actual connection between the rate of depreciation of equipment and the rate at which money accumulates under a given rate of compound interest. The progress of depreciation must be assumed in any case. If we are to follow the proposition that it follows a curve instead of a straight line, it seems fair to assume that this curved line has a certain general form; and it would seem reasonable to assume that the 4

30. P. U. R. 1917 B, 96.

31. BAUER AND GOLD, PUBLIC UTILITY VALUATION (1934) 207.

32. Navjohs, *supra* note 22, at 189.

33. 13 F. (2d) 510 (E. D. Ky. 1925).

34. Plymouth Elec. Light Co. v. State, 81 N. H. 1, 120 Atl. 689 (1923).

35. Hasbrouck, *supra* note 15.

36. 7 Wis. R. C. R. 187 (1911).

per cent sinking-fund curve fairly represents the progress of depreciation under average conditions. Many appraisers oppose the use of a curve of any kind or form and rely upon the judgment of an expert as based upon the actual inspection of the equipment under consideration. Since, however, a great deal of equipment cannot be adequately examined in service, it is necessary to rely very largely upon age, and in such cases the appraiser actually depreciates upon an actual or mental curve which is based upon the more or less definite life table which is the result of his experience. More consistent and fairer results would appear to be obtained by the use of a life table compiled from the experience of a large number of experts in connection with a definite curve, even if the basis for the use of such curve rests, to some extent, upon assumptions which are more or less difficult to justify with exactness."

As the foregoing statement would imply, none of the methods of computing depreciation can give accurate results. They arrive at approximations only. This is due to the fact that machinery and equipment of any kind do not wear out or depreciate with any certain degree of regularity. The question is made still more difficult by the fact that there is not a clearly drawn line between what should be charged to depreciation and what should be charged to operating expenses. The Wisconsin commissioner, in distinguishing between depreciation and maintenance, gives the illustration of an electric lighting plant costing \$5,000 new which is operated for a period of ten years but still kept in good running condition by repairs. It is as efficient as when first put into use; still it has fallen off in value and would not be appraised at \$5,000. The depreciation fund, he points out, must be equal to the difference in the value of the machine at that time and when new, although the machine may have been maintained all the time in good running order.³⁷

It has been contended that if a plant is rendering one hundred per cent service no depreciation allowance should be made. This contention is not sound since depreciation is loss of value and not loss of efficiency. The attorneys for the company made that contention in *In re Boise Water Company*³⁸ case in their efforts to secure as high a valuation on the property as possible. The commission rejected the claim, saying: "The condition of utility property today may be such as to enable it to render service at approximately one hundred per cent, but its condition tomorrow may be such that it will be unable to render such service. Where property is rendering service at approximately one hundred per cent it is self-evident that its condition is then such as to render such service. It is judging the condition of the property from the service which it is rendering."³⁹ And in the *Minnesota Rate Cases*,⁴⁰ although the master found that the depreciation was more than offset by appreciation,

37. *In re Cumberland Municipal Light Plant*, 4 Wis. R. C. R. 214 (1909).

38. P. U. R. 1926 D, 321, 346.

39. See Navjohs, *supra* note 22, at 164 and Note L. R. A. 1916 F, 765.

40. 230 U. S. 352, 456, 457 (1913).

it was held that the depreciation which had actually taken place must "be found and allowed for."

By none of the methods for computing depreciation, we have seen, is it possible to arrive at an exact result. There are so many varying elements that enter into each case that at best the result is an approximation. What happens then when a management has failed to make sufficient allowance to meet all the losses that occur or what happens when a too generous percentage of the earnings have been set aside for depreciation and a much larger fund is built up than the company is entitled to? If sufficient provision has not been made in the past, can the management make up the loss by charging a larger amount than it otherwise should in the future? The Supreme Court touched upon this point in its first outstanding case bearing upon the question of depreciation, *Knoxville v. Knoxville Water Co.*⁴¹ Justice Moody there said that if the management failed in its duty to exact sufficient returns, either through distributing too large dividends or failure to exact proper prices for the company's output, the fault was upon the management and that the returns upon the true value of the property devoted to the use of the public could not be enhanced by consideration of the errors that had been committed in the past. In other words, it was just the company's bad luck that its management had not seen to it that a proper allowance was made for depreciation each year. This result is undoubtedly just, for the patrons of the present or the future should not be made to pay for what those of the past should have paid for.

On the other hand, where there has been too great a charge made for depreciation, it is the company's good luck. The leading case on the point is *Board of Public Utility Comm. v. New York Telephone Co.*⁴², where the company had accumulated a depreciation reserve of nearly seventeen million dollars, through excessive charges over a period of time. The board ordered nearly five million dollars of this fund to be used to make up deficits for the year 1925 and subsequent years. The United States Supreme Court held that this was error, as the company could not be required to give future subscribers any part of the accumulations from past operations. The court said that this fund did not belong to the subscribers but to the company. In *Smith v. Illinois Bell Telephone Co.*⁴³ the court pointed out that recognition of the ownership of such excessive reserve in the company did not make it necessary to allow similar accumulations to be piled up in the future.

Of course where these accumulations are amassed during a period of protracted litigation over raising or lowering a rate and the court has ordered such sums to be impounded and their disposition to be determined by the

41. 212 U. S. 1, 14 (1909).

42. 271 U. S. 23 (1926).

43. 282 U. S. 23, 145 (1930).

outcome of such litigation, they will be returned to the subscribers upon a finding against the contention of the company. Such was the case of *Lindheimer v. Illinois Bell Telephone Co.*,⁴⁴ where the case was before the courts for about ten years and several millions of dollars had been impounded and were finally ordered repaid to the subscribers.

PURPOSE OF ALLOWING DEPRECIATION

In its leading case on the subject of depreciation, the United States Supreme Court laid down the principle that depreciation is to be provided for in order to keep the investment unimpaired. To quote the language of Mr. Justice Butler in that case: "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."⁴⁵ And in a recent case Mr. Justice Sutherland, quoting the *Knoxville* case with approval, said that the purpose was "to get a sum sufficient to restore the property and not merely to recoup its original cost."⁴⁶

The shipper in the case of *Hammond Lumber Co. v. Public Service Comm.*⁴⁷ contended that all that he was required to pay for carriage of his goods was an amount sufficient to cover a reasonable rate of interest on the value of the plant employed in the carriage. The defendant carrier contended that it was entitled to a rate that would give a fair return of interest on the value of its plant and also provide for the depreciation of the property under all circumstances of the particular case. The court said the company ought to be allowed to come out even in an undertaking which may reasonably be expected to exhaust itself, and besides receive a fair compensation for its services.

In *Petersburg Gas Co. v. Petersburg*⁴⁸ it was pointed out that the value of real estate used or useful in the operation of a public utility plant is not subject to any deduction for depreciation, because land does not wear out, although it does rise and fall in market value.

The question of depreciation allowance ordinarily comes before the court in either one of two ways and may be presented in these two ways in the same case. It may come up in estimating the value of the property on which a return is to be made, the rate base, or it may come up in estimating the amount of income that the company is to be allowed to raise by its charges. The company naturally urges as small a depreciation allowance in the first case as is possible and as large a one as is possible in the second. For instance, in

44. 292 U. S. 151 (1933).

45. *Knoxville v. Knoxville Water Co.*, 212 U. S. 1, 14 (1909).

46. *United Railways & Elec. Co. v. West*, 280 U. S. 234, 254 (1930).

47. 96 Ore. 595, 189 Pac. 639 (1920).

48. 132 Va. 82, 110 S. E. 533 (1922).

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Pacific Gas & Electric Co. v. San Francisco,⁴⁹ the company contended that the accrued depreciation should have been fixed at about half the sum allowed by the master. The smaller the depreciation allowance subtracted from the valuation of the property, the larger will be the property valuation on which a return must be allowed.

However, when it comes to fixing the amount that the company shall be allowed to raise by its charges annually, the shoe is on the other foot and it is for the company's interest to make the depreciation charge as large as possible so as to swell the annual charge. An instance of this may be found in *Board of Public Utility Comm. v. New York Telephone Co.*⁵⁰

DEPRECIATION BASE

The question also arises whether depreciation is to be allowed on the present value of the plant or on its original cost, that is, what base is to be taken? This problem was presented in *United Fuel Gas Co. v. Public Service Comm.*⁵¹, where the court accepted the proposition that depreciation should be calculated on the basis of present value of the property rather than its original cost. If the purpose of allowing the charge is to preserve the "integrity of the investment" the present value would seem to be the right basis as the cost or replacement is the measure of what is used up. In a time of falling prices this rule works against the company, but in a time of rising prices it is to its advantage in determining the rate to be charged, but, of course, against its interest in estimating the rate base. The rule, however, seems well settled that it is the present value and not the original cost that is taken.⁵² As the court said in *San Diego Land & Town Co. v. National City*,⁵³ the property protected by the Constitution is the present value and not what was originally paid for it.

The Interstate Commerce Commission, however, has pointed out some of the difficulties that arise in taking the present valuation as the base for estimating depreciation.⁵⁴ It suggests the instance of a locomotive or any unit of property that has become obsolete and is retired for that reason; and asks the question whether the present value of the obsolete property is the cost of replacement in kind? It further points out that in the case of coal consumed in the operation of a railroad, the amount that should be charged to operating expenses is the actual cost of the coal and not what it would cost to replace it. If the reason for allowing depreciation charges is to protect original invest-

49. 265 U. S. 403 (1924).

50. 271 U. S. 23 (1926).

51. 278 U. S. 322 (1929).

52. *United Railways & Elec. Co. v. West*, 280 U. S. 234 (1930).

53. 174 U. S. 739 (1899).

54. 177 I. C. C. 378, 379 (1931).

ment as the Supreme Court intimated in earlier decisions,⁵⁵ it would seem that the Interstate Commerce Commission's contention is sound, namely that original cost and not present cost of replacement should be the base. However, the Court seems to have firmly settled on the latter in the *United Railways* case.⁵⁶ It said in that case that in rate-making the base is present value and that "it would be wholly illogical to adopt a different rule for depreciation." In contrast with the view of the majority of the court in the *United Railways* case is the dissent of Mr. Justice Brandeis. His statements seem to summarize the opposition view so well that it is worthwhile to quote from his opinion at length:

"To use a depreciation charge as the measure of the year's consumption of plant, and at the same time reject original cost as the basis of the charge, is inadmissible. It is a perversion of this business device. No method for the ascertainment of the amount of the charge yet invented is workable if fluctuating present values be taken as the basis. Every known method contemplates, and is dependent upon, the accumulation or credit of a fixed amount in a given number of years. The distribution of plant expense expressed in the depreciation charges is justified by the approximation to the fact as to the year's plant consumption which is obtained by applying the doctrine of averages. But if fluctuating present values are substituted for original cost there is no stable base to which the process of averaging can be applied. For thereby the only stable factor involved in fixing a depreciation charge would be eliminated. Each year the present value may be different. The cost of replacement at the termination of the service life of the several units or of the composite life cannot be foretold. To use as a measure of the year's consumption of plant a depreciation charge based on fluctuating present values substitutes conjecture for experience. Such a system would require the consumer of today to pay for an assumed operating expense which has never been incurred and which may never arise."⁵⁷

In some unaccountable way, an illogical idea sprang up that the patrons of a public utility have some property right or "real interest" in the reserve fund built up to take care of depreciation, especially if it be added to the capital of the company and expanded in additional facilities; and that the company was not entitled to include such additions in the valuation on which it was entitled to a fair return. The customers of the company, so the argument goes, created this fund through the additional charge made on them and they

55. *Knoxville v. Knoxville Water Co.*, 212 U. S. 1 (1909). See *Re Perry Telephone Co.*, P. U. R. 1922 D, 374, 375.

56. 280 U. S. 234 (1930), cited note 46, *supra*.

57. *Id.* at 277-278.

should not be made to pay for its use in the business. This argument sounds somewhat socialistic and far-fetched; nevertheless, at one time it received the sanction of the Supreme Court of the United States⁵⁸ and has been followed in some states,⁵⁹ and Mr. Justice Brandeis seems to give approval to the doctrine in a note to his dissenting opinion in the *United Railways* case.⁶⁰ The doctrine also has the wholehearted approval of Professor Goodard, an eminent authority.⁶¹ In the Case of *Railroad Comm. of La. v. Cumberland Telephone & Telegraph Co.*,^{61a} Mr. Justice Peckham, speaking for the Supreme Court, said:

“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 it 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.”

Mr. Justice Butler, speaking for the Court in *Board of Comm. v. New York Telephone Co.*⁶² seems clearly to show the fallacious nature of this doctrine when he said:

“Customers pay for service, not for the property used to render it. Their payments are not contributions to depreciation or other operating expenses, or to capital of the company. By paying bills for service they do not acquire any interest, legal or equitable, in the property used for their convenience or in the funds of the company. Property paid for out of the moneys received for service belongs to the company, just as does that purchased out of proceeds of its bonds and stocks.”⁶³

This position of the Court has been sustained in later cases, notably in *Smith v. Illinois Bell Telephone Co.*,⁶⁴ when the commission deducted from the valuation for rate purposes, a depreciation reserve of \$26,000,000, which had been invested by the company in extensions and additions, on the ground that it had been contributed by the subscribers of the company. The District

58. *Railroad Comm. of La. v. Cumberland Telephone and Telegraph Co.*, 212 U. S. 414 (1909).

59. Burns' Ann. Stat. of Ind. (1933) § 54-219.

60. 280 U. S. 234 (1930), cited note 46, *supra*.

61. Goodard, *The Interest of Public Utility Rate-Payers in Depreciation* (1935) 48 HARV. L. REV. 721.

61a. 212 U. S. 414 (1909), cited note 58, *supra*.

62. 271 U. S. 23 (1926).

63. See also, Wolf, *Depreciation in Rate-Making* (1930) 4 ST. JOHN'S L. REV. 214, 224; Guernsey, *supra* note 6, at 203, 209.

64. 282 U. S. 133 (1930).

Court of three judges held that this was error to exclude these extensions and additions from the rate base. This ruling was sustained by the Supreme Court on appeal. The Court observed, however, in commenting on the size of the reserve, that past experience is an indication of the company's requirements for the future and that the recognition of the ownership of the property represented in the reserve did not make it necessary to allow similar accumulations to go on if experience shows that they are excessive. The holding in *Lindheimer v. Illinois Bell Telephone Co.*⁶⁵ does not recede from this position. There the court found that the depreciation reserve claimed by the company to a large extent represented provision for capital additions, over and above the amount required to cover capital consumption. This reserve was built up by excessive annual allowances for depreciation charged to operating expenses. The necessity for such annual charges must be shown by the company and in this case the company had not sustained the burden of proof cast upon it.

DEPRECIATION RESERVE

Mention is often made of a depreciation reserve. In most cases no such fund or reserve is actually kept by the company. The allowance received for depreciation is usually invested in additions to the plant or in addition facilities. The funds are used as additional capital. In rare cases, however, the moneys received for depreciation are actually set aside and invested in high grade securities and kept intact until the property is actually replaced by new purchases with these funds. In such case, of course, the reserve is not to be taken into consideration in estimating the valuation of the property for rate purposes. It is not part of the property devoted to the public use in that case.⁶⁶

AMOUNT OR PERCENTAGE ALLOWED

The amount or percentage of the total valuation to be allowed as depreciation is a relative matter. As shown in discussing the straight-line method of computing depreciation, the life expectancy of the plant is estimated and the cost divided by the life expectancy gives the annual allowance to be made. In a large, well-organized company the replacements for wear and tear tend, as already stated, to be more or less constant and can be fairly accurately estimated in advance. In *Georgia Railway & Power Co. v. Railroad Comm.*⁶⁷, the company asked for an allowance of 2½ per cent, but the commission and the court allowed only 2 per cent. In *Bluefield Water Works v. Public Service Comm.*⁶⁸ a total allowance of 5.87 per cent was sustained. In estimating the

65. 177 I. C. C. 409 (1931).

66. Guernsey, *loc. cit. supra* note 63.

67. 262 U. S. 625 (1923).

68. 262 U. S. 679 (1923).

depreciation of a bridge in *Clark's Ferry Co. v. Public Service Comm.*,⁶⁹ one per cent was allowed when $2\frac{1}{2}$ per cent was asked for. The allowance on a gas plant in *Dayton Power & Light Co. v. Public Utility Comm.*⁷⁰ was estimated at 2 per cent of the valuation. The Interstate Commerce Commission points out that in the case of telephone and railroad companies the state commissions have made allowances ranging between four and eight per cent of the investment in the property.⁷¹ In *Brush Electric Co. v. Galveston*,⁷² estimates of accrued depreciation varied from 15 to 40 per cent. The master fixed it at 28 per cent and the district court increased the allowance to $33\frac{1}{3}$ per cent. Of course in accrued depreciation there could well be cases of much larger allowances.

SUMMARY

We have noted the growing importance of questions dealing with the allowance of depreciation charges, especially in computing the valuation of public utility plants for rate-making purposes, both for arriving at a rate base and for determining the annual charges. We have considered several definitions of the term depreciation and found that it is the allowance that must be made for the replacing of apparatus on account of wear and tear, increase in the demand for the product created, and changes in the state of the art. We have found that the courts refer to different kinds of depreciation: accrued, realized, annual, theoretical, actual or observed, and functional. We have also considered the various methods of computing depreciation: the replacement where the full value of the unit is charged up when the unit is worn out; the straight-line method which is based upon cost of the unit and its expectant life and is found by dividing the former by the latter, the quotient giving the annual depreciation of the unit; the compound interest method where it is sought to establish a uniform annual amount to cover an appropriate annual reservation from income caused by depreciation and a fair return on this value; the sinking-fund method, fixing the annual depreciation charges so that such charges, together with compound interest on the same, will produce an amount equal to the value of the property at the end of its life period; the observation method which calls for estimates by persons who inspect the property in question; and finally, the curved-line method which is one of the several forms taken by the sinking-fund method. None of these methods can give accurate results.

The contention that where a plant is giving one hundred per cent service no depreciation should be allowed, is met by the statement that depreciation is given for loss of value and not for loss of service. Where the management

69. 291 U. S. 227 (1934).

70. 292 U. S. 290 (1934).

71. 118 I. C. C. 295, 329 (1926).

72. 262 U. S. 443 (1923).

has failed to provide for depreciation in the past the mistake cannot be corrected by increased charges in the future; and on the other hand, if too great exactions have been made in the past, that fact will not prevent the allowance of depreciation charges in the future. Such accumulations may be evidence, however, that a rate is too high.

The United States Supreme Court laid down, in its leading case on the subject, the proposition that the purpose of allowing depreciation is to keep the investment unimpaired. The problem is presented to the court in either one of two ways, in estimating the value of the property for rate-making purposes or in determining the annual charges that are to be provided for in the rate. As a basis for estimating depreciation, it seems settled in the Supreme Court that present value of the property is to be taken rather than the cost of the same. This rule raises certain difficulties which have been ably pointed out by the Interstate Commerce Commission. The better view seems to be that the contention is unsound; that where the depreciation reserve or accumulation has been used for capital additions or extensions to the plant, such additions or extensions are not to be taken into consideration in rate-making, as the customers have some kind of a property interest in such fund. However, if a depreciation reserve is actually maintained and the fund invested in stocks and bonds, such fund is not entitled to be included in rate-making estimates. Finally, we have seen that the percentage of the valuation to be allowed for depreciation is a relative matter. In telephone and railroad cases, it has been observed that state commissions have granted from four to eight per cent of the investment.