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CHANGES IN THE ACCOUNTING TREATMENT OF CAPITAL ITEMS DURING THE LAST FIFTY YEARS

George O. May

This paper will discuss the changes in practice during the last half-century in accounting for the accumulation of business capital assets, not including those of agricultural and mining enterprises. It will do so from the point of view of an accountant, interested in some aspects of economics, addressing economists interested in some aspects of accounting.

It may be useful to begin by defining capital assets, the scope of the accounting to be considered, and some accounting terms. By "capital assets" are meant assets such as plant and equipment which are dedicated to the production and distribution of goods and services and are expected to have a useful life extending over a number of years or other accounting periods.

These assets fall into two main classes suggested by the terms "plant" and "equipment." Equipment is either mobile or of varied utility and easy to dismantle and ship. Plant is fixed in position and cannot be converted to another use except at a great sacrifice. The two classes present distinct problems, strikingly illustrated in the case of the railroads.

Accounting in general is a process of recording, analyzing, and interpreting transactions and events. It is concerned with individual enterprises, not with national aggregates and its conventions are determined accordingly. The branch of accounting with which we are concerned has two major objectives: (1) the presentation periodically (usually annually) of what are called statements of financial condition or balance sheets, and (2) the presentation of statements of income for the intervening periods. In one view, the balance sheet may be regarded as the primary document, and the income statement as merely an analysis of the elements that have brought about the change in financial position shown by successive balance sheets. In another, the income account may be regarded as the statement of major importance, and the balance sheet as a

tabulation of the balances left on the books for future disposition after income has been determined.

Economists concerned with the creation and exhaustion of the national stock of capital assets must recognize the limitations of statistics of accounting origin. They might desire statistics relating to the phases of the development of capital assets which include:

1. Research and experimentation to develop and improve types of assets
2. Creation of demand for products
3. Actual construction of the physical assets
4. Current maintenance
5. Exhaustion and obsolescence of units (depreciation)
6. Lessening or cessation of demand causing partial or complete obsolescence of the industry, or major parts thereof
7. Marked changes in the value of the monetary unit in which measurements are expressed

Accounting classifications do not lend themselves to such an analysis. In general, accounting does not take cognizance of items 6 and 7, or, except to a limited extent, of 1 and 2, but is concerned almost exclusively with items 3, 4, and 5. Some of the items listed are closely related; numbers 1, 5, and 6 are related because development of a new type may cause units of older types to become obsolescent or obsolete.

Again, current maintenance (4) and depreciation (5) are related. What must be considered under the latter depends on what has already been dealt with in the former. This fact is of great importance because the line drawn between expenditures to be treated as maintenance and those which are to pass through capital assets or depreciation accounts has varied between years, between industries, and between companies in the same industry. An important illustration is the treatment of retooling expense in the automobile industry. For many years, Chrysler Corp., in its reports, passed these expenditures through depreciation accounts, while General Motors Corp. treated them as operating expenses, as both companies do today. Another illustration is the varying treatment of intangible drilling costs in the oil industry.

How long the anticipated life of a unit must be to justify its treatment through depreciation accounts is a point on which there is no uniformity. In the early days of depreciation accounting, it was not, I think, the custom to apply it to property having a life of less than three years. Increased emphasis on monthly accounts and

considerations of regulatory policy, as in the case of the utilities, have tended towards a shortening of this period. On the other hand, increases in tax rates have tended to have the opposite effect.

Physical capital assets are created by fashioning physical things into forms suitable for designated purposes. The first step is to determine by research and experimentation in what forms plant and equipment can most usefully be created. Normally, continuous research and experience result in gradual improvements in the type of plant and equipment produced.

In accounting practice, the costs of research and experimentation are commonly treated as operating expenses and not as costs of capital formation, even when fruitful. There are, of course, exceptions to this rule, especially in the case of new developments by new organizations. These preliminary costs may, and often do, exceed the cost of producing the initial plant after its form has been determined. The significance of statistics of capital formation derived from accounting sources is therefore limited. The importance of this limitation is the greater because expenditures for research and experimentation have increased enormously in recent years. A recent estimate put current expenditures by government and industry at $3 billion annually, as compared with a prewar figure of $200 million. Industry's share was estimated at $1.8 billion.[1] High taxation affords a stimulus to such expenditures.

Since the development of new and improved products is essential to the successful continuance of our economic system, the allowance of its cost to be treated as an operating expense in measuring income for tax purposes may be regarded as socially desirable. Similarly, expenses incurred in creating demand are normally treated as operating expenses, although exceptions have been recognized with respect to newspapers and some other special forms of activities.

In earlier times, the facts that costs of this type were heavy in the case of industries such as railroads, and that these enterprises were considered permanent, were among the considerations that led to the adoption of the view that in this type of industry it was not necessary to provide for the exhaustion of capital assets that was taking place, but which was not being made good. The clearest case of acceptance of this view, which will be considered later, is to be found in the British Regulations of Railways Act of 1868.

One of the fundamental accounting postulates presently accepted is that, in the absence of actual evidence to the contrary, the life

[1] *Economist*, London, July 18, 1953.

of the enterprise may be deemed to be infinite. While provision is commonly made for the gradual exhaustion of the usefulness of units of plant and equipment by wear and tear or obsolescence of the type of unit, accounting, with few exceptions, does not contemplate provision in advance for the contingency that an enterprise as a whole may become incapable of reasonably profitable use because of cessation or lessening of demand for the products which it was designed to produce. When this happens, capital assets may be discarded or, as in the case of the railroads, be continued in relatively unprofitable use. Clearly, some estimate of the effects of industry obsolescence is needed.

During the past half century, some industries, such as street railways, have suffered complete obsolescence. More interesting perhaps are cases in which industries have suffered severe reductions in the demand for their product, and hence in their earning capacity, which seemed likely to be permanent, but which have been wholly or in part retrieved. The most important case doubtless is that of the railroads. Another is that of the breweries as a result of prohibition, which was later repealed.

Again, the steel industry in the 1930's seemed to have little prospect of anything approaching full employment for its existing capacity. During that entire decade annual production averaged less than 50 per cent of capacity. In view of these conditions, United States Steel Corp. in 1935 wrote off $270 million for industry obsolescence. World War II, however, created a demand for the product of the facilities which had been regarded as economically obsolete, and in 1948 the sum which had been written off was restored to the property accounts.[2]

From the standpoint of our economy as a whole, adverse effects on the stock of capital assets from industry obsolescence are no doubt much more than offset by the creation of new industries as the result of research and experimentation. In many cases also, individual corporations, foreseeing that parts of their business might become unprofitable, have developed new lines of activity to offset their obsolescence.

[2]In an attempt to measure the development of the British economy over the period 1870–1938, R. H. Phelps Brown and R. Weber, in an article in the June 1953 issue of the *Economic Journal*, made two approaches to the problem; one was to estimate the stock of capital in a base year and accumulate estimates of annual net investment; the second was to apply to the statistics of property income year by year a uniform rate of capitalization. In both cases adjustments for changes in price level were made. Whether the second method affords the best check on the results obtained by the first may be a subject for discussion.

American accounting has accepted as a postulate the proposition that changes in the value of the monetary unit, which is the accounting symbol, may be ignored. It has recognized that, as has happened in other countries, a decline in the value of the monetary unit might be so great as to force recognition of the decline, either by "once for all" adjustments or otherwise, but has taken the position that no such decline has taken place up to now. However, it now seems to be recognized that what is known as LIFO inventory[3] accounting is a major attempt to reflect charges against revenue in terms of units of the same purchasing power as those in which revenues are expressed, and therefore a departure from the principle of ignoring changes in the value of the monetary unit.

A study group on business income which published a report entitled *Changing Concepts of Business Income* (Macmillan, 1952) expressed the view that ". . . in the longer view, methods could and should be developed whereby the framework of accounting would be expanded so that the results of activities, measured in units of equal purchasing power, and the effects of changes in value of the monetary unit would be reflected separately in an integrated presentation which would also produce statements of financial position more broadly meaningful than the orthodox balance sheet of today.

"It is believed that statements of business income in which revenues and charges against revenue would be stated in units of substantially the same purchasing power would be significant and useful for many of the purposes for which income determinations are commonly used, if not also in reports upon stewardship" (page 105). For tbe present, it suggested that efforts might be made to reveal the desired information in supplementary statements.

In any historical study of accounting, changes in the general form of organization of business are of crucial importance; significant changes have taken place during the past half-century. Our business economy is now conducted through business organizations which vary in type. For the present purpose three classes may be recognized: (1) The regulated public utilities, (2) The large industrial companies whose ownership, generally speaking, is widely distributed, and, (3) The smaller business enterprises.

The development of mass production has increased the number and importance of enterprises in the second category. Along with this has come the creation of a managerial class which is con-

[3]Last in, first out; a system which calls for the charge against revenue of inventory items on the basis of the *latest* rather than the oldest, as in FIFO.

cerned primarily with the maintenance of the *flow* of operations and insurance of the permanence of the business.

A direct effect upon accounting is to extend the applicability of the postulate of permanence. More far-reaching in result is the fact that, as Schumpeter has pointed out, the growth in size and efficiency of industry has changed its relationship with government and labor. Managements have become more concerned with these relations than with the desires of stockholders. Accounting policies have become more stabilized and in the twilight zones less influenced by the views of owners and more related to long-term results.

The problems of capital formation and capital consumption and maintenance cannot well be separated in discussion of the early years of the century; in any case, it would be desirable to consider them together. They can most conveniently be dealt with in relation to types of industries, though different considerations apply, as already noted, to fixed plant and equipment.

Railroads

A study of the problem in relation to the railroads is of peculiar interest (1) because during the half-century they reached and passed their zenith so that they present the problem of accounting for a declining industry, (2) because although the larger part of their assets are fixed, a substantial part of them consists of movable equipment, (3) because during the half-century they have become subject to an increasing degree of governmental control, and (4) because in various respects they present a strong contrast to the electric light and power industry and the telephone industry, which are also regulated.

At the beginning of the century, the railroads were perhaps the most important business owners of physical capital assets, but it would be difficult to measure the extent of those assets in monetary terms, either then or at a later period. America was taking its accounting largely from Great Britain, from which it was still securing financing for its development. In Britain, accounting was still trying to adjust itself to the needs of an economy of which the factory system and wide diffusion of ownership of enterprises through limited-liability companies had comparatively recently become important parts.

With us, the memory of the depression of 1893, in which many railroads went into receivership, was fresh, although conditions were generally favorable. Hence the practices of the railroads on the whole were governed by conservatism. Many "betterments"

such as increased weight of rails, which did no more than keep the railroads abreast of the times, were charged against revenues. Some railroads had closed their capital asset accounts entirely.

At the beginning of the century we were still in an era during which building railroads for sale to the public or to existing systems, was, itself, an industry. The growth of investment was especially pronounced between 1907 and 1914. During World War I, investment showed little expansion, and while investment, measured in real terms, increased moderately during the 1920's, the increase in investment between 1914 and 1951, still speaking in real terms, is estimated at not much over $1 billion, as compared with an increase of roughly $4 billion in the years 1908–1916.

In 1907 the Interstate Commerce Commission began to increase its influence over railroads by establishing accounting classifications. Up to that time, provision for property exhaustion had generally been made either through renewal reserves (used mainly with respect to equipment) or by charging replacements, whether large or small, against operating expenses. A new classification introduced what is called "depreciation accounting," that is, a system of amortizing the cost (or other basis) of property over "useful life," which had been introduced in industrial accounting some twenty years earlier. By the new classification, railroads were required to capitalize all betterments, though they were permitted to make "appropriations of income" in respect thereof.

At that time, A. Lowes Dickinson, the leading practicing accountant of the day, expressed the opinion that sound depreciation accounting would not appreciably change the amount of operating expense. He held, however, that the methods proposed were unsatisfactory.[4] Depreciation accounting did not assume substantial importance until 1914 and then only with respect to movable equipment and some special structures.

In 1920 the Transportation Act authorized and required the ICC to determine for what classes of property and at what rates depreciation provision should be made. The courts were then holding that the rate base must be the fair present value of the property devoted to the public use, but the ICC was seeking to make its "valuation" of the railroads effective, and to bring about recognition of cost less depreciation as the fundamental determinant of the rate base. Its attitude is indicated by the statement in its 1926 report: "In our consideration, therefore, of the relative burdens imposed by the

[4]In a series of letters addressed to the ICC and published in pamphlet form by Price Waterhouse & Co., of which I was a member.

depreciation and retirement methods of accounting, we must start with the premise that the former presupposes full deduction of accrued depreciation in ascertaining the rate base value." It was anticipated that the revenues of at least some of the railroads would exceed a reasonable return on investment and that substantial national revenues might be derived from "recapture" of the excess.

But for this objective, there would have been little purpose in instituting depreciation accounting for fixed property at the stage of railroad development that had then been reached. More useful results might have been achieved by instituting a system of regulated renewal reserves.[5] Depreciation accounting might well have been confined, as it had been in the past, to equipment and special structures. The provisions to be made might more usefully have been regulated, in part at least, on the basis of *use* and not solely of the lapse of time; both theoretically and practically there are justifications for varying provisions according to the degree of activity.

Over the years, replacements and depreciation must quantitatively be roughly equal to retirements in a mature economy. In such circumstances, replacement accounting has the advantage over depreciation accounting in that the charges are based on the level of prices on which revenues are received.

The ICC made a report on depreciation in 1926; in response to protests, it reopened the case and made a second report in 1931. By that time, conditions had changed from prosperity to depression and replacement costs had fallen; operation of the depreciation order was suspended; it was not put into effect until 1943.

In the interval, two actions of the ICC are of great significance. The first proved anew that understatement of operating costs in bad times, which was recognized as an evil of private management, might occur as a result of deliberate action under government regulation. The story is told by the ICC as follows:

"When permitted by the Interstate Commerce Commission, a carrier may charge retirements and repairs to profit and loss which are ordinarily chargeable to operating expenses. Such items appear in the Profit and Loss Statement as 'Delayed Income Debits' or to some extent as 'Miscellaneous Debits' and 'Loss on Retired Road and Equipment.' Charges to account 'Delayed Income Debits' have varied in recent years as follows:

[5]See the author's article, "Carrier Property Consumed in Operation and the Regulation of Profit," *Quarterly Journal of Economics*, February 1929.

December 31, 1928	$ 6,049,545
December 31, 1929	7,369,919
December 31, 1930	37,616,254
December 31, 1931	65,629,895
December 31, 1932	28,439,318
December 31, 1933	42,779,220
December 31, 1934	60,906,646

Charges to this account result in smaller charges to operating expenses than if the ordinary accounting procedure were followed, but it cannot be said that they result in understating the true operating expenses of the accounting period because these charges usually relate in large measure to operations of preceding years."[6]

The action of the ICC was motivated no doubt by a desire to avoid situations which would have been economically undesirable or disastrous, such as making railroad securities ineligible for holding by financial institutions. In the same spirit, regulatory authorities have, on occasion, permitted commercial banks and insurance companies to carry securities at values which could not have been realized, although the institutions were governed by laws requiring that securities should not be carried at more than their market values.

The depression which led to the action recited brought many railroads into receivership from which some have not yet emerged. Reorganization of these roads with capitalization scaled down to less that the "value in use" of the property employed raised an important question concerning the charges to be made against revenues when property was retired or subjected to depreciation accounting.

In the Chicago Great Western Railroad Company case (ex parte 138), the ICC met this problem in a judicious way by requiring that the charge should be based on the *service value* of the unit without regard to the computed cost thereof to the reorganized company. This method was accepted for federal income tax purposes for reorganized railroads only.

The great importance of this point and the wisdom of the ICC's decision have not, I think, been adequately realized. In the many reorganizations that followed the depression of 1893, there had generally been no reduction in capitalization. Bondholders received bonds of lower priority or capital stock; holders of capital stock received stock in the reorganized company upon paying what was

[6] *Statistics of Railways*, Interstate Commerce Commission, 1934, pp. 63–64.

virtually an assessment, but took the form of a subscription to stock, at a price greatly in excess of its worth in the market.

In the reorganizations that followed the Great Depression forty years later, the ICC undertook to limit the total capitalization to sums upon which it was not unreasonable to suppose that the company might be able to pay interest or dividends. Thus, the new capitzlization represented a rough evaluation of future expectations and ceased to be a measure of the capital invested that needed to be maintained.

World War II created numerous problems for the railroads, including those arising from the enforcement of depreciation accounting (which could hardly have occurred at a more inappropriate time). To the extent that depreciation accounting was substituted for renewal accounting, the effect was to base charges for exhaustion on the lower prices of an earlier period rather than on the current price level at which replacements had to be made.

A study made for the Study Group on Business Income showed net income reported as available for property reserves, dividends, etc. in 1947 at $479 million, but estimated that adjustment of the charge for property exhaustion in terms of current dollars would have reduced this sum by approximately $210 million. (This, despite the fact that of the total of combined charges for maintenance, replacement, and renewals and repairs, less than 30 per cent was made on a depreciation basis.)[7]

The railroads present in a striking way the problem of industry obsolescence, which has been given little consideration in accounting. In 1940 the Class I railroads showed an investment in "road and equipment" of $25.6 billion, with accrued depreciation reserves of $3.1 billion, the net figure being thus $22.5 billion. During World War II extraordinary charges for amortization of new facilities were made with the result that at the end of 1950 the net investment had increased by only about $1 billion during the decade. In the ten years the expenditures on road had amounted to $2.6 billion while expenditures for equipment had been $5.1 billion. This was due largely to dieselization, which has brought new life to the industry.

As already pointed out, depreciation charges reflect past costs and not the cost of making good exhaustion. Since the railroads have passed maturity, this may be regarded as tending to produce an overstatement of income. But even on this basis, the income is not adequate to constitute a reasonable return on the net sum at

[7] *Business Income and Price Levels, An Accounting Study—1949* (privately printed but widely distributed).

which road and equipment are carried. The securities outstanding against this investment aggregate only $15 billion and the market value of the securities is doubtless less than par.

Looking backward, we can see that fifty years ago the railroads were destined to find a large part of their most profitable traffic diverted to other means of transportation and to undergo other changes which would make them partially obsolete. They still perform almost indispensable services, but these services do not yield a reasonable return on the capital that has been invested in them. Street railways in many cases have suffered complete industry obsolescence following a period in which improper capitalization of changes in the type of operation was common.

When industry obsolescence becomes complete in a given area, it doubtless receives some form of recognition in accounting and in statistics of capital formation and exhaustion. Accounting faces the task of giving recognition to such developments before they reach the final stage.

Electric Power and Light

The electric power and light industry offers a sharp contrast, for it is still in a period of rapid expansion. Federal Power Commission statistics of privately owned utilities of classes A and B show that the recorded investment on December 31, 1951 was 60 per cent greater than five years earlier. This expansion has taken place despite the fact that governmental sources now supply about 18 per cent of the total users of electric power.

In the early days of the century, when the industry was in an experimental stage and units rapidly became obsolete, it was undoubtedly general practice to capitalize the cost of the new unit without making any appreciable deduction from capital for the retired units. Later the industry adopted the retirement reserve method of dealing with property exhaustion which, as I have said elsewhere, combined the defects of the renewal reserve system and depreciation accounting, since it deferred any provision for exhaustion until replacement was imminent, but then quite illogically, based the charge on the cost of the property then to be retired rather than on the cost of the replacement. This practice seemed to some accountants unjustifiable; for many years they steadfastly refused to accept without qualification accounts prepared on this basis.

During the 1920's a number of conditions, of which this practice was one, combined to bring about an exaggeration of net capital

formation and earnings in the industry. Other contributing factors were (1) a strong movement toward combinations of enterprises through the creation of holding companies, coupled with the fact that the prices to be paid in these acquisitions were usually determined on the basis of reported net income, and (2) the attitude of the courts toward regulation, which required that the rate base should be fixed in relation to current price levels, and that only "observed depreciation," and not depreciation calculated by formula, should be deducted from new value in arriving at it. Inclusion in operating cost of a charge for property exhaustion as it accrued would have placed an undue burden on consumers.

It is not surprising, therefore, that the utility commissions tolerated the retirement reserve method of providing for exhaustion. Reserves thus created have a reasonable relation to the observed depreciation which was deducted from new value in determining the rate base.

In the second half of the 1930's the attitude of the courts toward the rate base changed and the commissions gradually introduced depreciation accounting into the determination of both the rate base and the income of the utility. A series of protracted legal battles ended in the complete victory for the commissions in the succeeding decade.[8]

Furthermore, the commissions undertook to determine the extent of "improper" capitalizations and underprovisions for depreciation that might be deemed to have taken place in the past and required the utilities to make good these "improprieties" by provision out of net income.

The average annual rate of depreciation is about 2.5 per cent.[9] The line drawn between charges to maintenance and charges against depreciation provisions is such that maintenance charges amount to only 7 per cent of operating revenues as compared with depreciation charges of 9.0 per cent. The combined total of 16 per cent is thus equivalent to about 4.0 per cent of investment. If it may be assumed that this rate would, in a period of monetary stability, be adequate to provide for upkeep of the property, it obviously could not be deemed to include any substantial allowance for obsolescence. And

[8] *Federal Power Commission et al. v. Hope Natural Gas Co.*, 320 U.S. 591 (1944). *U.S.A. et al. v. New York Telephone Company*, 326 U.S. 638 (1946).

[9] Federal power statistics for 1951 state the rate of 2.2 per cent, but this rate was computed on the investment at the end of the year, which included (to the extent of about 8 per cent) construction work in progress and other items not representing plants in actual operation.

certainly the provision made is not adequate for the exhaustion that is taking place, measured in terms of monetary units in which the revenues are received.

Statistics of the Federal Power Commission covering utilities of classes A and B show that from 1940 to 1951 charges for maintenance (which reflect the full effects of rising prices) rose from 5.1 per cent to 6.9 per cent of operating revenues, while the depreciation provisions (which do not fully reflect these changes) declined from 10.7 per cent to 9.0 per cent of revenues. Income before interest and dividends increased from $850 million to $1,100 million. If exhaustion charges were adjusted to current price levels, this increase would disappear.

From 1940 to 1945 the percentage of accumulated reserve for depreciation and amortization to investment increased rapidly—from 13.3 per cent to 21.2 per cent. From that point, increasing investment slowed down and then reversed the trend so that at the end of 1951 the reserve stood at 20.3 per cent of utility plant investment.

Certainly no provision is being made for hazards such as the railroads have encountered in the last half-century. And the development of publicly owned electrical plants and such revolutionary changes as could be forthcoming from atomic energy suggest that those hazards may be even greater than any the railroads have suffered.

Materially different results are arrived at if income tax returns are used as a basis in computation instead of FPC statistics or the individual reports of corporations. This point may be illustrated from a prospectus which came to hand as this paper was being prepared. The prospectus stated that in the company's own accounts composite rates for electrical properties of 2.0 per cent had been taken and that the charges on that basis had been for the last three years (in round figures) $5.0, $5.6, and $6 million, but that the deductions claimed in the same years for tax purposes had been $8.2, $8.8, and $8.3 million, exclusive of $800,000 for amortization under certificates of necessity in the last year.

The prospectus also stated that the total sum being amortized under certificates of necessity was estimated at $32.0 million, representing property to be placed in service during a three-year period. In the first year following completion, the amortization charges claimed for tax purposes on the new construction would thus amount to $6.4 million as compared with about $640,000, the normal depreciation charge.

Regulatory Policy

The common defense offered for the refusal of commissions to allow the electric utilities to provide for exhaustion of capital assets on the basis of current rather than past price levels is that advanced by Charles W. Smith of the FPC in his dissent from the conclusions of the Study Group on Business Income:

"Utilities, in particular, under the investment principle of rate regulation, should adhere to the cost basis of stating depreciation expense. Under the investment principle of rate regulation, when the additional investment is made, it is protected through the allowance of a fair return thereon plus full depreciation. This is a practical method in that it avoids guesswork and at the same time fully protects the investment, whatever it may be when made."

Acceptance of Smith's argument assumes that the present "protective" policy will be effective over many decades and will continue even though the price level may turn markedly downward or the industry may suffer industry obsolescence. Both reason and past experience indicate the vanity of any such hopes.

Telephone Industry

A contrast to the industries already considered is afforded by the history of the treatment of property exhaustion by the Bell Telephone System. Depreciation accounting on a liberal basis has from the first characterized the accounting of the system. When regulation came, the industry attempted to provide for exhaustion as it occurred, both in its own accounts and in the measurement of income for rate purposes, and to sustain a contention that only "observed depreciation" should be deducted in measuring the rate base. For many years it maintained these inconsistent positions with considerable success. But in the case of *Lindheimer* v. *Illinois Bell Telephone Co.* in 1934, the Supreme Court rejected its contention. The court held that the company, on which the burden of proof rested, had failed to show that the rates established by the Federal Communications Commission were confiscatory; that it had not shown that its depreciation charges were necessary; and that in fact such a contention was contradicted by its own claim as to the depreciated value of its property.

In this industry, if the statistics err, it is on the side of overstatement of property exhaustion, at least in the period prior to 1934.

Private Industry

It is difficult to offer generalizations in regard to the treatment of property exhaustion in private industry. Undoubtedly provisions have been far larger than in public utilities (other than the telephone service).

In the early part of the century, it was common to deal with the problem mainly or even wholly by charging additions and betterments against revenues in determining income. A striking illustration is afforded by General Electric Co., whose report for 1907 states that between 1893 and 1907 additions to buildings, plant, and equipment (which stood at the beginning of the period at about $4 million) had amounted to $23 million, of which $18 million had been charged to revenue so that the net increase in these accounts for the fourteen years was only $5 million. Until the coming of income taxation, it was common for industrial companies in New England to make no additions to or deductions from capital asset accounts from year to year.

Again, a comparison of the statements of United States Steel Corp. and Bethlehem Steel Corp. will show that Bethlehem Steel has relied more on charges against maintenance and less on depreciation charges than its main competitor. In general the example United States Steel (which in its first annual accounts for 1902 set an example of sound accounting and fair disclosure) has resulted in provisions for property exhaustion of the steel industry which are at least adequate by accepted accounting standards. (No doubt in some prosperous years they have been more than adequate.)

The petroleum industry, which is another large owner of capital assets, is beset with so many uncertainties that the estimation of property exhaustion is extremely difficult. There is little doubt that errors have been generally on the side of conservatism.

Recent History

In 1947 United States Steel Corp. took the lead in increasing its exhaustion charges on account of the rise in price levels. A number of other companies, including E. I. DuPont deNemours and Chrysler Corp., took various forms of action with the same objective. A technical committee of the American Institute of Accountants issued a statement which was later embodied in one of its formal bulletins disapproving all such actions and adhering to the position that exhaustion charges (depreciation) should be based on the money cost of property, unless, by formal and appropriate action, the property accounts had been restated at a higher figure (which

has been done in few if any cases). The Securities and Exchange Commission declined to accept annual reports made by the companies in question, but eventually accepted accounts in which substantially similar results had been reached by methods which had not been proscribed by the A.I.A. In neither form were the charges accepted for income tax purposes. The A.I.A. committee still adheres to the position taken in 1947, although a substantial minority disagree at the present time.[10]

This incident has raised anew the question often discussed in the past regarding the proper function of what are inappropriately called "depreciation charges." In the earlier discussions the word was used in its colloquial sense, in that what was sought to be provided for was said to be a "loss in value" due to the condition to which capital assets were subject. Similar language is frequently employed today.

Beginning in the 1880's in Great Britain, the theory gained ground that depreciation accounting should be concerned only with amortizing cost over useful life without regard to changes in *value* during that life. In the effort to emphasize the point that depreciation was not to be measured by periodic revaluations, the relation of the problem to the necessity for replacement was unduly minimized.

Throughout the period, however, there can be found frequent mention of the necessity of maintaining a provision large enough to provide for the proper maintenance of assets. One of the most effective statements on this point of view is contained in a report by two highly regarded academic accountants and a lawyer in 1938:[11] "Broadly speaking, a plant should be maintained out of revenue in a state of efficiency corresponding to the normal progress of the manufacturing arts of that industry." The Study Group on Business Income commented: "The criterion is not a precise one, but few accounting criteria are."

It does not seem necessary to develop this point at length, because I assume that from the economic standpoint the desirability of measuring revenues and charges against revenues in terms of units of equal purchasing power would be generally conceded.

A word ought to be added regarding the term "useful life." From the earliest discussions of depreciation accounting, it has been

[10]This development is discussed at length in the report of the Study Group on Business Income.

[11]T. H. Sanders, H. R. Hatfield, and U. Moore, *A Statement of Accounting Principles*, American Institute of Accountants, 1938, p. 35.

recognized that the length of life of property depends partly on what is done to preserve or extend that life and on what is regarded as continued usefulness.

A unit maintained as standby equipment is still useful, but to charge its original cost by equal installments over the period during which it was either in full use or in reserve would obviously result in overstatement of income over the earlier years. Again, a unit may have a life of forty years, provided always that important parts costing, let us say, one-third of the original cost of the unit are replaced during the period. If salvage is ignored, the useful life in that case would be deemed to be thirty not forty years. Obviously, one-thirtieth of the original cost in each of forty years would provide for the cost of the original installation and the replacements necessary to the realization of an *actual life* of forty years.[12]

Finally it ought not to be forgotten that in depreciation accounting much depends on (1) the size of the unit depreciated (a ship may be one or many depreciable units), (2) whether units are depreciated individually or as a class, (3) whether a composite rate is applied (as it is commonly done in the electric power industry) to all property, and (4) where the line is drawn between charges to maintenance and charges to either the property account or against an accumulated depreciation reserve.

It will be understood that in this paper I have discussed only the accounting practice that was current over the half-century. In certain industries, notably the railroads, the utilities, and steel, there have been investigations, some of them extremely detailed, of their

[12]Extract from letter of Price Waterhouse & Co. to H. C. Adams, April 30, 1907: "Another, and in our opinion preferable as being a more practical conception of the term 'estimated life,' is that it means the average effective life of the property, which must be determined on a consideration not only of the term which will elapse before the property is abandoned as obsolete, but also of the estimated life and scrap value of the several component parts of the property and the percentages of the original cost presented by such component parts. It is undoubtedly possible to arrive at an estimated life on this basis which will be approximately correct, and when this is done a depreciation scheme which distributes the original cost over the term of such an estimated life will clearly be sufficient to provide for all renewals which restore or extend life, and will result in the distribution of both wear and tear and obsolescence substantially to the periods in which they accrue. In such a calculation the element of obsolescence is relatively a minor consideration, and any error in the rate of depreciation adopted, which may be caused by an incorrect estimate of the period which will elapse before the property is finally abandoned, will be very small as compared with the error which would result from a similar cause in a calculation made on the basis indicated in the preceding paragraph."

history and accounting; and economists and statisticians may be able to supplement the information available from the reports of individual companies from these sources. This is probably more feasible in relation to producers' durable equipment than in relation to construction carried out by the corporations themselves. Wherever labor costs are involved, retroactive adjustments cannot be made with any great accuracy.

Today there are pressures both internal and external on the accountants to make a larger contribution to the history of industry than they are now making. No one, however, can read the literature of the profession without realizing how strong is the opposition to any departure from what are claimed to be the traditional limitations of the art.

COMMENT

ROBERT EISNER, Northwestern University

In an analysis of accounting procedures, and in particular in any recommendations for change, one should be aware of varied and far-reaching implications of both current and proposed practices; for these practices have close ties to the mechanism distributing the national income and, through private expenditure and governmental fiscal effects, to the determinants of the aggregate amount of that income.

Thus there may be various grounds on which one may wish to question such statements as that of George O. May: "... I assume that from the economic standpoint the desirability of measuring revenues and charges against revenues in terms of units of equal purchasing power would be generally conceded." One may also wish to take exception to a 1938 statement of accounting principles quoted by May: "Broadly speaking, a plant should be maintained out of revenue in a state of efficiency corresponding to the normal progress of the manufacturing arts of that industry."

For one thing, the American economy has been characterized by what might be considered, after a generation of experience with the phenomenom, as a rising price trend. If there is a general expectation that, regardless of cyclical or "random" fluctuations, this trend will continue, a "purchasing power" adjustment for one sector of the economy will involve not merely a redistribution over time of the secularly unchanged shares of the national dividend accruing to various sectors of the economy; it will entail as well the very real

possibility of a substantial permanent change in these shares. The existing corporate profits tax structure enhances this possibility. That structure places a premium on any adjustments, such as those implicit in the purchasing power suggestion, which will increase the "charges" against revenues and hence reduce stated taxable income.

It may well be that after due consideration economists will decide that corporate profits after taxes are not high enough and should be raised. However, it hardly seems appropriate to bring about this result as an unannounced by-product of an attempt to clarify accounting practices. Indeed, if our prime concern were consistency, we might ask why consumers should not be allowed similar adjustments for the increased costs of replacing their homes, automobiles, and other durable assets. More obviously, why should not holders of bonds and other titles to assets fixed in money terms receive some kind of purchasing power adjustment in the interests of consistency (as Modigliani has also pointed out)? However, if this were to be done, would the economy become hopelessly encumbered by these restraints on price and interest flexibility? For recall that some economists consider this flexibility necessary for reasonably smooth adjustment to the variety of disturbances—both exogenous and endogenous—with which our economic system must cope.

Maintenance of plants "out of revenue in a state of efficiency corresponding to the normal progress of the manufacturing arts of that industry" may raise even more serious questions. Considering again our profits tax structure (although the extent to which wage claims and dividend payments are related to "accounting profits" makes tax considerations not the only relevant factor) this proposal may be viewed as a government subsidy to existing firms for the improvements and innovations which new enterprises would incorporate in their new plants without a corresponding subsidy. One may argue further that business taxes measure the varied services or contribution of government or of society as a whole involved in the "progress of the manufacturing arts throughout our economy." Then should not the firms which participate in this progress pay a substantial share of the cost of the services which make the progress possible? Indeed, one may carry the argument still further and suggest that workers who dissipate their strength and stamina in decades of work in mine or mill should be similarly compensated or subsidized in order to be put on the same footing as the healthy, modernly trained young men who are able after rela-

tively brief experience to offer industry more than the worn-out men of the older generation.

There is no intent, in this brief comment, to offer any conclusive remarks on these subjects. My chief point is that many of the apparently innocent and superficially "obvious" proposals for more efficient and meaningful accounting practices, particularly with regard to the charging of depreciation, are far-reaching in their effects. These effects must be considered carefully before reasonable decisions can be made as to the merits of such proposals.

SOLOMON FABRICANT, National Bureau of Economic Research

George O. May's experience is so vast that I feel at a disadvantage in discussing his paper. You will remember how Laurence Sterne, arguing about the order of things in France, had his opponent turn on him triumphantly and ask: "You have been in France?" I was not in the United States of 1903; and I cannot overcome my handicap by taking the next stage to Dover. One and twenty years give a man far stronger rights than one and twenty miles of sailing. All I can try to do, therefore, is to add one or two notes to May's interesting piece of history, by way of emphasis and supplementation.

Economists need to work with accounting data when they study profits and other income, capital formation and capital consumption, national wealth and national balance sheets. Therefore it is extremely important that they be aware of the effect of changes in accounting practices on the character of their data. But it is not only changes in accounting practice that do things to our data. Even stable accounting practices may put secular and cyclical peculiarities into the figures at our disposal. For example the prevailing practice of calculating depreciation on a straight-line basis causes depreciation charges to be stable, although the use made of plant and equipment varies cyclically. And incomparabilities among the figures of different industries arise because accounting practices, although stable, vary among industries. Maintenance accounting is emphasized among railroads, while in manufacturing the emphasis is on depreciation accounting: calculated profits of these two industries move differently merely because of these accounting differences.

We must realize, further, that in a significant sense accounting practice changes not only when the rules are altered but also when the situation in which they are applied is altered. In the report that May prepared for the Study Group on Business Income, he noted

the accounting postulate that the value of money is reasonably constant. This postulate is not realized when price levels change radically. In effect, therefore, change in price levels will change the nature of accounting data even though accountants hold to their rules.

These various points may be of some consequence to the interpretation of the figures on business earnings reported by the National Income Division of the Department of Commerce. The last-mentioned point, for example, is surely important today. As we all know, the NID puts into its accounts the business calculations of depreciation at original cost. When prices change within narrow limits, these estimates will not yield results much different from those that would be yielded by the more appropriate current-cost accounting estimates. But prices have not been changing within narrow limits. The difference between current-cost accounting and original-cost accounting is no longer negligible.

REPLY BY MR. MAY

Solomon Fabricant's comments call only for thanks since they add to rather than dissent from what I have said. I have worked with him for many years and much of his thinking is reflected in my own.

Robert Eisner makes three points which call for comment. Upon the first, I would point out that in the passage which he quotes I used the word "generally," not "universally." I did so advisedly because one of the ten economist-statistician members of the Study Group on Business Income did disagree with the view expressed.

With regard to his comment on the 1938 Statement of Accounting Principles, which I quoted, I would point out that in wage adjustments it has become customary to assume a steady rise in efficiency in the equipment employed in industry.

Eisner's comment on the suggestion that revenues and charges should be expressed in units of the same purchasing power loses its validity if that unit is the current monetary unit. In that case, the net income attributed to business will be measured in terms of current money, just as wages and the income from bonds are measured. If the rise in that income is disproportionate to the rise in other forms of income, the remedy is, as Sir Henry Clay has pointed out, properly made on the revenue side, not by understating costs.