company without a depreciation or replacement fund. To demonstrate this statement let us put the facts into the shape of a formula, assuming that a depreciation fund had been created:—

Let P = original cost of plant.
Let A = additions to plant paid for from charges to depreciation.
Let a = additions to plant paid for by capital other than from charges to depreciation.
Then $(A+a)$ = total cost of additions to plant.
Let D = accrued depreciation.
Let F = depreciation or replacement fund.
Let I = total investment.

Then we will have

$$I=P+(A+a)-D+F$$

Since D and F are equal, this equation reduces to

$$I=P+(A+a)$$

In other words, the original investment in plant and additions thereto has been maintained. Since no fund has been created, the Public Service Commission says:—

$$I=P+(A+a)-D$$

Assuming that the amount D has been completely expended in additions A

we have

$$A=D$$

and hence

$$I=P+a$$

This shows clearly that the company's investment has been reduced by the amount of depreciation charged off, and that the company has no asset to offset this loss. Surely this is not justice and does not accord with the decision of the United States Supreme Court in the Knoxville Water Co. case which is quoted later.

Setting Aside of Depreciation

Sound business principles require the setting aside of depreciation. The Pennsylvania Public Service Law provides, Article II., Section 1 (i):—

"It shall be the duty of every public service company to carry a proper and reasonable depreciation account, if required so to do by the order of the Commission."

And also (Article V., Section 15):—

"The Commission may, and shall after hearing had upon its own motion or upon complaint, establish by an order to be served, as hereinafter provided, upon every public service company affected thereby, a system of accounts to be used by such public service companies: and may also in its discretion prescribe the manner and form in which accounts, records and memoranda shall be kept by public service companies, including the accounts, records and memoranda of the conveyance of passengers and property and a proper and reasonable depreciation account, . . ."

Uniform System of Accounting

In carrying out these sections of the law, the Public Service Commission under date of March 25, 1918, prescribed and issued a uniform classification of accounts for water companies, in which it provides for the keeping of an account to be known as "Depreciation of Structures and Equipment Reserve." This is on the asset side of the balance sheet, is a subtractive account and is identical with what has been generally carried as "Accrued Depreciation" on the liability side of the balance sheet. The Westmoreland Water Co. was, therefore, carrying a depreciation account such as water companies are now required by the Public Service Commission to carry, and yet the assets of the company were reduced by the amount of that account with no offset, and this was justified by the claim that the money had been returned to the stockholders because it had been invested in extensions and betterments to the plant. Of course, in obtaining the value of the physical plant it was perfectly proper to subtract the amount of accrued depreciation. The gradual reduction in the value of the plant because of depreciation is a fundamental fact, but if the original investment is to be maintained intact, there must be a corresponding asset equal in amount, and this is the depreciation or replacement fund.

By way of illustration of what this may mean to the investors in a water works enterprise, let us assume that the original cost of a plant is $1,000,000, and we will consider that no additions are made to the plant, also that it is a pumping plant of ordinary construction, and that to create a proper depreciation or replacement fund to be invested on a 4 per cent. sinking fund basis, 1 per cent. per year of the original cost of the plant must be set aside. This means an average life for the plant of about forty-one years. Under these assumptions the amount in the replacement fund at the end of each year would be as follows:—

First year	$ 10,000
Second year	20,400
Third year	31,261
Fourth year	42,465
Fifth year	54,163
Sixth year	66,330
Seventh year	78,983
Eighth year	92,142
Ninth year	105,882
Tenth year	120,061
Fifteenth year	200,236

These figures are based upon the assumption that there had been no replacements made. This would probably be true for the first ten or twelve years, and we might then reasonably expect replacements requiring money to be taken from the replacement fund. If, however, at the end of fifteen years this company met with a rate case requiring the valuation of its plant, it will find its plant value reduced by 20 per cent. of the original investment, and according to decisions up to the present, unless it has the equivalent funds in a depreciation or replacement fund it has nothing to offset this loss. This is, of course, upon the assumption that the earnings of the plant have not been excessive and hence there has been no return of this amount, or any part of it, to the stockholders.

Against this method of valuation we have the decision of the Supreme Court of the United States in the case of Knoxville vs. Knoxville Water Co.:—

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

Reproduction Cost Less Depreciation

Surely nothing could be plainer than that, and yet, in decision after decision of the various State Utility Commissions, accrued depreciation has been subtracted without any regard to whether or not it has ever been earned, or if earned it has ever been returned to the stockholders.

Arguments in the effort to convince commissions of the correctness of this theory have been made so often, only to be ignored, that it seemed almost as hopeless as the effort to convince the commissions that "going value," "cost of establishing business," or "the value of established business," —whatever one chooses to call it—has a separate and distinct cost and value over and above that of the physical plant. It was, therefore, with surprise and pleasure that the author noted the decision of the Wisconsin Railroad Commission handed down June 1, 1918, in the case of the Milwaukee Electric Railway and Light Co., *et al.*, vs. City of Milwaukee. (P.U.R. 1918-E.) In this decision the commission says:—