Economics

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THE COST OF THE SERVICE THEORY

OF RATE MAKING.
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# FOREWORD

It has been the attempt of this paper to treat the cost of the service theory not by the isolation of the theory but rather by comparison and contrast with the other principal theories of ratemaking. The treatise is based on a wide range of literaure on the subject, but is by nomeans exhaustive of such literature. The study has covered principally the American roads but the theoretical portions are of general significance.

University, Virginia.                R. B. F.
May 15th, 1923.

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## THE COST OF THE SERVICE THEORY OF RATE MAKING

Economics has been defined as " the science that treats of those phenomena concerned with the wealth getting and the wealth consuming activities of man." (1) It then becomes necessary to make a brief survey of a few of the usages and concepts of economic science which will be appropriate to and useful in this study.

It is evident from this definition that man is the center of economic activities. The very origin of the word economics is the Greek meaning household management and concerning itself with the management of the household, an institution of man. (2) Furthermore, the science is concerned with production as a means the logical end of which is consumption of the products of production. It then becomes necessary to examine the several factors of production. As may be readily expected, society has not recognized all of the factors at all stages of its development and only the modern conception of these will be presented here. (3) The four factors of production are, land, labor, capital and the entrepreneur. The recognition of the entreprene as a factor of production again points to man as the center of economic activities.

(1). Ely, R. T., Principles of Economics, -
(2). Haney, L. H., History of Economic Thought, -
(3). Ibid , -

In a brief examination of these several factors it is to be stated that land includes all natural agents, including waterfalls, the air, and every gift of nature. Professor Seligman points out that this factor should be treated separately because of its source, its durability, and the differential nature of its income, rent. (1) Pure economic rent is the result of the existence of different qualities of land possessing different grades of fertility. It is therefore, a differential element determined by the marginal or the last piece of land that is brought into cultivation. Professor Irving Fisher declares that all capital produces an income which is also differential in nature since all capital is not equally productive, and sees no reason for declaring land peculiar because of the differential nature of rent. (2) It may be added that land differs further in that though it is capital it is not freely reproducible as in the ease of other capital. Capital in this sense is used to mean wealth used to produce more wealth and wealth as "all useful agreeable exchangeable things which may not be obtained without labor and sacrifice." (3)

Labor is the exertion of human energy and effort not merely for the pleasure of exertion and is productive when it adds to the sum total of utilities, Capital is wealth used to produce more wealth but it is obvious that the factors labor and captal are not and could not be considered seperately. Professor Seligman points out that labor never produced any thing absolutely per se, (4) and the same is true of capital. The share of

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(1) Seligman, Principles of Economics, -
(2) Fisher,
(3) J.S. Mill, Principles of Economics, -
(4) Seligman, Essays on Taxation, -

labor in the social income is wages and that of capital is interest. To treat the theories connected withe the shares in the social income by the four factors would be farefetched and irrelevant here. As to the entrepreneur as a factor in production, it is sufficient to state that he is the go between , the undertaker, who brings labor and the other factors together that they may be productive and his share in the social income is known as profits, the latter being used in the economic sense.

The activity of men concerns itself with production and consumption. We have examined briefly the factors of production. It now becomes necessary to study the nature of production. Production in the creation of utilities and with this all of the factors of production are concerned. It may be asked why does all production merely concern itself with the creation of utilities. In this regard the breadth of the statement takes into regard the distribution also. In answer to this question it will suffice to recall that neither production nor consumption can add or subtract from the sum total of matter, Production merely makes the matter more consumable by adding utility to it while consumption is the change in the form again recognising production as an means and consumption as an end.

The utilities added by production may be time, form, or place. The grain elevator is an example of time utility as is the cold storage plant, both being factors in preserving food until it is needed. Manufacturing is said to add form utility while transportation is said to addplace utility.

Thus the railroad is concerned with the creation of place utility.(1)

This paper concerns itself with an attempt to study the determination of the remuneration due the railroad for its service in the creation of place utility. The question does not resolve itself into the determination of the share of land or labor, capital or the entrepreneur for as in the case of all enterprises all of the factors are drawn upon by the railroad in its operation. Capital labor and the entrepreneur are foremost in the railroad enterprose but land must support the latter two and form a formidable source for the former.

The remuneration of the railroad takes the form of revenue derived from rates which are the prices charged for the services. Defined in terms of economics price is the value of a commodity or service stated in terms of the medium of exchange. Value is the power of one commodity to demand another in exbhange for itself. This is value in exhhange, the only value taking a useful conceivable form in economics. Normaly price is determined by the law of supply and demand under conditions of free compitition, that is, price will be determined at the point at which supply and demand are in equilibrum. This point will be under the same conditions, the cost of production plus a fair rate of profit.

Cost as an ultimate determinant of price, under such conditions was recognized by Ricardo. This has been accepted

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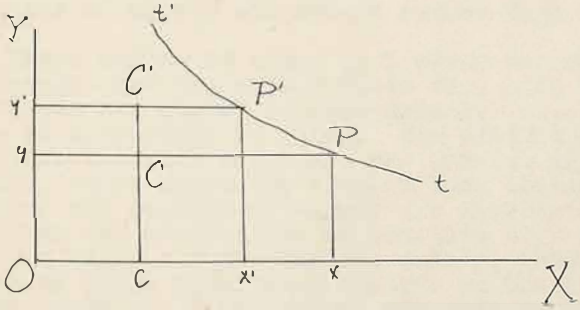
(1). Marshall, Principles of Economics, p. 674.

in economic theory since that time. As applied to the determination of railroad charges, Albert Fink(1) was probably the first to seriously suggest the procedure. In speaking of rate theories, President A. T. Hadley attempted to state the proposition in the form of a mathematical equation.(2)

To begin with, Hadley states that rate theories should be based on observation made from practice and not preconceived notions of what practice ought to be. Rates take the form of a differential equation.

> The manager lowers rates until the differential of the gross earnings on a particular line of traffic ceases to be greater (that is becomes equal to the differential of the operating expenses----. The rate is the independent variable. The volume of the traffic is the function of the rate; as the rate diminishes, the volume usually increases and never decreases. Let x equal the rate per carload for a particular class of goods, between two given points, and y equal the number of carloads obtained at that rate. The successive values of y corresponding to the successive reductings reductions of x will form a traffic curve. OP equals xy, the rate per carload multiplied by the number of carloads obtained at that rate. Cy (i.e. rectangle OC) equals the special expense of hauling y carloads; and (x minus c)y (the rectangle cP) equals the profit in the widest sense, that is, the share to be



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(1). Henry Hudson, The Southern Railway & Steamship Association, Q. J. Econ. Vol. 5

(2). A. T. Hadley, Railroad Transportation, p. 261. Also see Different Meanings of Cost, Q. J. Econ. Vol. 11 p. 310; and Workings of the I. C. C. Law Q. J. Econ. Vol. 2 (1888) p. 377.

appropriated to (the) general expenses and dividends. The manager wishes this to be as large as possible. How will a reduction of rates affect this?

Reduce to $x'$ and the traffic is $y'$, the gross earnings $OP'$ and the expenses $OC'$. The increase in earnings is $yP$ minus $xP$ equals $x'Dy$ minus $yDx$. The increase in operating expenses equals $yC'$ equals $cDy$. At the point where the former ceases to exceed the latter, the differentials must be equal. Then $xdy$ minus $ydx$ equals $cdy$; or $(x$ minus $c)dy$ equals $ydx$ ( for convenience of illustration, the differentials themselves arenall treated as positive/ Due allowance for this is made in the signs of the terms.) The same result might have been obtained in another way. The rectangle $cP$ equals $(x$ minus $c)y$. The railroad manager wishes to make this a maximum. Its first differential must, therefore, equal to zero. Then $(x$ minus $c)dy$ minus $ydx$ equals to zero; or $(x$ minus $c)dy$ equals to $ydx$.

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This curve is independent of the railroad manager and depends on business conditions. Each class of commodities has a a curve of its own. The right end of the curve is based on the value of the commodity and a high rate would reduce it to the $x$ axis , It wil extend far to the right for valuable commodities. The upper end of the curve depends upon the expansiveness of supply and demand rather than value.

> Where either of these is limited the curve soon soon approaches the axis $y$ where they both expand readily. the curves run almont perpendicularly ----. Such traffic tends to areduction in rates. The traffic in food, fuel and other articles of common use furnish the best examples of this, it is generally true of long distance traffic by which new sources of supply are developed.
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> Thus the possibility of charging high rates depends upon the value of the article mainly, butthe profitablene of making large reductions depends on the expansiveness of the traffic. If reductions are made on traffic which does not expand, somebody else besides the railroad gets the whole profit. When the supply canexpand, but the demand does not the benefit goes to the consumers. This is the case in general reductions of rate on manufactured articles where there is no pool. If demand can expand more rapidly than supply , the production goes into the pocket of the producers or middlemen.. This is the case in the milk traffic.

Hadley then argues that fixed charges and dividends do not affect charges except in so far as a road which is paying high dividends may reduce rates lower than otherwise it would

in order not to tempt other capital into the field. But while fixed charges are not taken into consideration in making rates the prospective revenue is taken into consideration before incurring the fixed charges.

It has been stated that rates as a price will be determined under conditions of free and perfect competition at a point that will yield the cost of performing the service plus a fair rate of profit. But the rate wars preceding 1887 have prove that the railroad is an industry in which absolutely free competition is neither desired nor practicable. Such an experience as the rate wars of the early 70's (1) Show that this is true. Competition will always fail in any business of large decreasing costs and large traffic of which nature the railroad partakes. Thus two roads whose tracks are parallel engage in a rate war. At each reduction in rates by the one the other attempts to make a greater reduction. This continues until one of the roads is a bankrupt. Its capital is in the nature of such an investment that it cannot be retired from the business as in the case of the grocer, so it will go into the hands of the receivers to be operated at bare costs perhaps . In many cases before the federal government supervision was quite so extensive , the successful competitor would purchase its defeated rival. This has been demonstrated throughout the history of American railroads. It is obvious then that the railroad tends to become a monopoly. Moreover, it often happened that the owners of the road would voluntarily operate their road in such a manner that it would go into the hands of the receivers in order not to have to pay fixed charges

It has already been observed that rates and prices are of a very similiar nature and practically identical. A railroad rate is a price for the addition of place utility to commodities Again, it has already been observed that if unrestricted competition was permitted or if rates and rate making were not regulated rates would tend to become monopoly prices and subject to monopoly law in price making. (1)

This leads to a discussion of rate theories and policies which have been crystallized from views of all parties concerned with and affected by rates. Beginning with the decision, Munn versus Illinois, which declared that certain industries are affected with a public interest though they are owned and operated by private individuals, the railroad has been recognized to be in that category. It is recognized that there are interests affected by the railroad vastly too important to entrust to one person or group of persons. Whether regulation by the state or state ownership is desirable is not in the province of this paper. So important is the question of rases and rate making that whole cities or towns may be destroyed by a change in the tariffs of the railroads. The growth of certain cities may be greatly stilted by the same thing. Thus Lynchburg and Danville are two cities in Virginia and are competitive points on the Southern railroad. Certain discriminations seem to have been made against Danville in favor of Lynchburg. For example, a ton of fertilizer shipped from Chicago to Danville costs about $ 4 ( approximately) more in freight when shipped to Danville than when shipped to Lynchburg. It seems that cotton rates that

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(1). Marshall, Principles of Economics, p485 -487.

were favorable to Danville has been the extent of favors to that city. The first cases to come before the Interstate Commerce Commission included the case of alleged discrimination in rates in favor on Richmond and against Danville. (1)

It is evident that railroad owners and managers are not interested in rates per se. They wish to see their capital yield sufficiently to justify their investment in that industry rather than some other. This yield must be sufficient to pay operating expenses and fixed charges and leave a reasonable and fair return on their capital. Moreover, it is recognized that the public has a certain very vital interest in rates. The public's interest is to see the greatest amount of commodities reach the market or the place of consumption.

The modern conviction is that rates should be reasonable as witnesses the clause in the Act to Regulate Commerce. It is not unreasonable to expect the railroads to contribute to the social welfare. (2) These are the chief considerations that have been crystallized into the several theories of operation of the railroads.

The first theory of operation we shall treat is the theory often known as the "utopian" theory of running these highways. The railroads would be operated as objects of public enjoyment, and consequently free in the sense that the streets or the public schools are free. It is at once seen that this would be a gross discrimination against the man whose business required him to do little traveling and in favor of the man who travelled much.

Secondly, the railroads might be operated on the basis of a fee charged specifically for the service performed. This would correspond to the situation of the postoffice and is known as the "postal" theory of operation. Under this theory of operation the railroad might have its expenses to exactly equal its revenues or as the postoffice usually does it might operate on a deficit basis and have this deficit made up from taxation. In the latter case it is evident that the form of discrimination referred to in the above theory of utopian rates would prevail here also.

Thirdly, and lastly the railroad may be operated on the basis of a profit. Whether under state ownership or private it seems certainly as yet this is the most feasible plan. It is not the province of this paper to discuss the great merit of self interest or to laud the great laissez-faire principle of Adam Smith, yet it seems that until many changes have come over our society this must be the theory of operation for our railroads. The question resolves into some return against a high return on the investment. Reasonableness has such an elastic meaning that the wisdom of of one generation would seldom give it the same interpretation as that of the preceding or the succeeding. It is under this latter theory that the most of the theorixes of rates as actually practiced arise.

Obviously there would be no rates under the utopian theory of operation. As there is no charge made for vertical

transportation as evidenced by elevators so would the same principle be applied to the railroads. This could be the state of affairs only in a socialistic state the merits of which relevant here nor would the general arguments against such a state add to the thesis of this paper.

Under the postal theory of operation a fee would be for the service specifically performed. As in the case of the postoffice distance and geographical advantages would be totally ignored. The same charges would be made for passengers or freight regardless of the length of journey. It might happen that a system of zones might be used as in the case of our own parce post. The American street railway is to a large extent an example of the postal theory of rates. In this particular industry also is seen the zone feature. Again, certain through freight is treated in a manner not unlike this in regard to rates. It is only fitting that we pause a moment to note that one of the most outdtanding arguments against such a theory of rates is that it would affect certain gross discriminations. It is obvious that certain sections of the country have natural geographical advantages for certain industries. In speaking of this phase of international trade it would be said that one country has a comparative advantage ove another due to some geographical favoritism. This is equally true of different sections of the same country. It will be observed later in the treatment of the theories of the Interstate Commerce Commission that the Commission has not countenanced any tendency strictly adhering to such a policy of equalizing of geographical advantages. The postal theory of the theory of keeping everybody

in the business would equalize geographical and sectional advantages by making compensatory rates. Such a discriminatory rate would restrd the progress of society by encouraging sections ill fitted to certain industries to practice them , the effect being felt by all sections.

As already pointed out most of the rate theories arise unde the profit theory of operation. It is now in order to enumerate the theories arising underthis theory of operation with their several characteristics.

The value of the commodity(1) or the taxation theory of rated would make rates proportional to the value of the commodity. It will be later observed that the Interstate Commerce Commission laid much stress on this principle in their early decision and in speaking of the principle often used the term to mean the same thing as we are prone to understand from the term what the traffic will bear. Professor Cohn, who in his advocation of the governmental control and operation(2) of railroads sets forth the theory of" faculty"as a test of a just rate, argues that the rates of the five classes of passengers on German railroads tend to be proportional to their respective abilities to pay. It is immediately observed that the expression faculty is borrowed from the field of public finance and it is i in the field of public finance that Professor Cohn is primarily interested. Even this theory is a derivative of the cost of the service theory in that it recognises that a certain element

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(1) A Contribution to the Theory of Rates, F.W.Taussig, Q. J. of Econ., Vol.V, p. 439.

(2) G.Cohn. Die Englishhe Eisenbahnpolitik Der lesten Jahre, Leipsic (1883) p. 65-84.

of risk enters into the transportation of the more valuable commodities that does not enter into the transportation of the lesser valuable traffic. As stated above the taxation theory is akin to the well known theory of what the traffic will bear. It is needless to say that the taxation theory is not scientific as is the case of its kindredn theory of faculty in the field of public finance. However, it may indeed be socially good, yet the difficulties and the dangers of attempting to apply it to rate making seem to seriously discount any such anticipated goods.

A second theory of rates or what a traffic manager might term as a rate policy and not a rate theory at all, is the socalled developmental theory. This theory would be the basis of granting lower rates to young industries or newly settled sections of the country. Such a policy looks into the future and anticipates the probable growth of traffic if such an industry is now favored. The problem of anticipating the growth of traffic has already been discussed in connection with the value of the service theory as enunciated by Professor Hadley, and will be further treated in connection with the actual working out of rates in a later section of this paper. Often rates given under a developmental policy will be actually lower than the cost of rendering the service and the deficit will be borne by industries in lesser favored localities and industries. This policy seems to have been practiced in the California lemon industry. (1) Again, in the development of the California raisin industry(2) there was keen competition with the Spanish product. In 1891 the rate~~s~~ on raisins of native growth was

(1) The Development of Alaska by Railroads, Alfred H. Brooks, Q. J.of Economics, Vol. 28. p. 586.
(2) Ripley. R

one and three- fourths cents per one hundred pounds while the rate on Spanish raisins was three cents. Consequently no raisins were imported into California that year while that state shipped 34,000 pounds. Such rates are indeed a discrimination but to adjudge their reasonableness would require a close scrutiny of each case which does not come within the scope of this paper. Such a rate policy tends to be liable to the same criticism as high protection tariffs in regards to international trade. (1) However, the fact that a given rate is in the above sense a discriminatory rate does not mean that the rate in question is not good per se as witnesses the socalled commodity rates. In every day life we see the merchant giving a higher rate on certain goods and a lower rate on others, thus using the latter for the purpose of a "leader"to attract customers. The Interstate Commerce Commission has always countenanced the socalled socialization of rates. Thus it has permitted certain goods of wide usage to go at cheaper rates and adjudged them not to be discriminatory. (2)

The value of the service theory of rates would make transportation charges commensurate with what the public would pay rather than go without the service. It then tends to be always a maximum rate, though in practice it has not been that on account of other factors. The form this Principle has taken in actual practice is the socalled what the traffic will bear policy. In a word the principle is that

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(1) Railway Rates as Protective Tariff, M.O. Lorenz, Q.J Ec. Vol. p. 176, ff.
(2) Railway Rates as Protective Tariff, Hugo R. Meyer, Q.J. Econ. Vol. p. 1 ff.
(3) Johnson, E.R., American Railway Transportation, p. 280.

the charge made for the transportation of an article shall be based on the value added to the commodity by the transportation thereof. Thus it is argued that after a certain product is transported it has a higher value at the seaboard than inland. This reasoning tends to be in a circle or to overlook the fact that the changed value as evidenced by the higher price at the seaboardis due in part to the added transportation charge. Yet this is not the most difficult part or the greatest argument against value of the service as a principle inthe fixing railroad charges. The value of the service would put ratemaking on a subjective basis. It is therefore a difficult theory to apply in actual practice, though the Interstate Commerce Commission has endeavored to use the principle to a considerable extent, though to far the greater extent in the form of the value of the commodity principle. Asshall be discussed in the following pages Professor Pigou speaks of the value of the service theory as discriminating monopoly of the third degree.

Again, it may happen that the value of the service may be less than the cost of the service. In this case either the goods will move at a loss to the railroads or they cannot be accepted at the rate thus determined. Perhaps, the railroad might raise the rate on other commodities to offset the deficit and thus discriminate against these latter commodities. When all of these several ramifications are taken into consideration it seems that not the value of the service but the principle of what the traffic will bear has been the determining principle in ratemaking. (1)

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(1) Taussig, F.W. Principles of Economics, Vol. II, p.372.

In the following discussion the treatment of the two theories, cost of service and value of service shall be done by way of comparison. (1)

Professor Pigou says that value of the service is discriminating monopoly of the third degree. (2) As already stated previously, it is generally agreed that except in so far as transportation charges or services are supplied jointly with those sold at the same time to another set of purchasers simple competition will tend to bring about a system of uniform rates per ton mile for similar services. For these services the level of uniform rates would be such that the demand price and the supply price will coincide and when the service of the railroad transport was sold in conjunction with some other service such as cartage or packing, an appropriate additionwould be made to the charge. In light of this preamble an analysis is in order.

First, the actual level of the uniform mileage rate, to which simple competition would lead on any particular railway will depend on the circumstances and the position of the particular railroad, that is, if it passes throughpoor territory with a sparse populationor whether it was built with a high per mile cost due to the ruggedness of the country through which it passes.

Secondly, departure from uniform mileage rates will occur in simple competition in so far as buyers of a ton mile of transportation require along with this , other incidental

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(1) Pigou, A.C. The Economics of Welfare, 256-78. This discussion is based on this writing.
Seealso, Cost and Value of the Service in Ratemaking, Q.J.Econ. Vol. 30,p.205, M.O.Lorenz.

services involving expense. Thus small consignments require separate collection and delivery, separate handling and invoicing and accounting at the terminals, and bad loading in the cars. (1) This true of hauling of fruits and meats etc. requiring refrigeration. Authorities consider this proper. (2) On this ground a tapering rate as found in many European countries is justified.

Thirdly, attention must be called to the fact that the services though physically similar are not necessarily similar inrespect to cost. They will vary when they are rendered at different seasons of the year or even at different hauls of the same commodity at almost the same time of year and almost under the same conditions. Railways must produce the services at the time they are supplied" consequently the cost of the service principle would warrant higher rates or fares for travel at busy seasons and at busy hours of the daywhile in practice the busy portion of the day is the time when workmens' tickets are sold.

Lastly, the cost of the service theory or principle in some instances leads logically to lower charges to people whose purchases are more continuous than to those who buy intermittently. Thus the man taking continuous service cannot contribute to a peak load, while one taking service intermittently is likely in some degree to, to do so. It is difficult to make a practical differential though this form of discrimination is the basis of issuing season tickets.

The above reasoning ai true forservices sold to different groups of individuals and not being supplied jointly In case of joint supply the above statements are exceptions to the generalizations that simple free competition would cause all ton-mile of transpostation to sell at the sameprice In the case of joint costs there would probably evolve under simple competition different rates per ton-mile of each of the joint products. At this point Professor Pigou disagrees with Taussig that carrying coal and copper is really turning out two products, (1) any more than selling wool to two different merchants would constitute the creation of two products.

Pigou further shows that popular attachment to the value of the service theory is based on two confusions, first that the product of the railroad is joint , and second, that the railroad monopolist will when required to charge equal rate for coal and copper "stop stop transporting coal altogether while continuing to transport copper at a high rate." the national dividend being increased by the permission to discriminate between the two rates. This argument is valid in its field but is irrelevant here.

The same author then cites Professor Hadley showas is in favor of certain discriminations of this nature as are applicable in the way of what the traffic will bear and doubts that this is true of the entire railroad

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(1) Quart. J. Econ. Vol. (1910) p.47.
(2) Hadley, A.T. Railroad Transportation, p.

world and is an impregnable argument that the value of the service principle ought to be followed in the determination of all rates. He argues that there may be certain conditions under which discriminating monopoly of the third degree enables some traffic while the simple competition or the cost of the service principle might not. Thus, since the railroad has large fixed investment and fixed expenses it costs no more to haul a ton a week thatan several hundred thousand. The system cannot be made capable of effecting less than a certain minimum of transportation. (1) This is readily recognized as an argument in favor of the discriminating momopoly of the third degree. Again, inthe case of a very elastic demand for traffic services a small change in the rate would cause an important change in the demand. Here, too, the cost of the service or simple competition might not attract purchasers while the so-called discriminating momopoly of the third degree would. However, even the arguments in favor of the discriminating monopoly would not hold in the case where the demand for the service was greater than the supply. In order that they may hold the district affected must not be too busy and thickly populatednor musttoo little active or sparsely populated. There must be a certain immediate range of activity and population which does not seem, compared with the total range of possibility, to be very extensive. Hence, the probability that the conditions necessary to make discriminating monopoly of the third degree more advantageous to the national dividend than the simple competition will be present in any railroad selected at random at any time seems a priori to be small. It may, however, that a certain route may pass through such a period caused by a certain growthe of wealth and population

and which causes disappear when ~~an~~ some other later point in the growth of the two factors has been reached. Some infer that the value of the service might be used while the industry is in this stage of development only to be replaced when the population has later increased and with it the demand has sufficiently grown, by the cost of the service principle. (1) It seems that this period is brief for most lines.

Pigou in his contention that the cost of the service principle is preferable declares that rather than yield to the complex principle of discriminating monopoly of the third degree, it would be better to grant a bounty and finance it by general taxation. The bounty would continue during the period of the small traffic described above. The general interest of the public seems to warrant this to the discrimination in favor of a few traders or rather in the end, the customers of these traders. We are thus left with the cost of the service principle modified at the need, sometimes by bounties, sometimes by bounties on particular services deliberately sold for less than cost.

In applying the above principle, the author acknowledges the difficulties of cost accounting and declares at times certain flat rates may be charged or some rates used but believes that does not invalidate the principle or the soundness or the usefulness of the cost basis.

There are two distinct views of the cost of the service principle. Cost may be used to mean an additional expense due to the acceptance of the commodity for transportation and which would not have been incurred if it had not been accepted. This takes th

the view of the charge being for a specific service. This would necessitate a more refined cost analysis and allocation of costs than has yet been offered. On the other hand, cost may be used to mean all costs, fixed and variable, leaving the question as one of the just apportionment so that all commodities transported will bear their share of the cost. (1) At another place in this paper an analysis of costs an a discussion of the possibility of cost allocation and cost apportionment will be treated.

A remarkable stand is taken by Sakolski on cost as the ultimate basis for ratemaking. As previously noted, under conditions of free competition, cost plus a fair and reasonable rate of profit will ultimately be the basis of price. If price rises more capital will be invested in the field until such an amount of capital appears as to more than satiate the demand. This would lower the return on the capital in the field, and discourage further investment therein. Sakolski holds: that:

> The cost of the service theory is unsatisfactory for by no means can railroad costs be measured by or applied directly to particular railway services. The transportation cost of each class or kind of commodity not only differs, but each item differs at any given time and each haul has a different cost. Cost is a resultant of all conditions under which the transportation is done---- One of the chief elements affecting cost in railroad transportation is traffic density (that is the volume of traffic). The more business done, the lower the cost of performing each unit of service. The rates themselves influence the volume of business Accordingly, to base rates entirely on cost would be attempting to find one unknown in terms of another.(2)

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(1) Johnson and Van Metre, Railroad Transportation, p.335.
(2) Sakolski, A. M. American Railroad Economics, p.5.

It seems that this statement follows the ancient view which reasoned in this fashion as did even the classical school. The attack of the Austrian school was from the same approach as that of the above author. The Austrian or psychological school then offered the theory of marginal utility to explain this economic paradox. (1)

Professor Ripley attacks cost from a number of angles. He observes that certain roads delay expenditures during lean years and defer until better years making an untrue use of cost as a basis of rates. Again, costs will vary a great deal in the case of different roads. This certain roads built throught rugged mountainous countrywill not be comparable to the expense of a road built over a Southwestern plain. However, the question arises as to how these varied costs are to be reconciled on through traffic. Another angle of attack is the claim that the railroad presents a case of joint costs and accordingly accurate and direct allocation is practically out of the question. In regard to another aspect of the latter point Professor Ripley argues that the fixed charges are fixed only up to the point of full utilization of the railroad plant. After the full utilisation of the entire plant the question of the allocation of the new additions must be faced. This array of attack is indeed a formidable one on the strict cost of service basis of ratemaking. A fuller discussion of these points will be made in the section of this paper dealing with the allocation of costs. (2)

A kindred theory both to the value of the commodity and

(1) Mill, J.S., Principles of Economics, p.
(2) Ripley, W.Z. Rates and Regulation, p.

the value of the servide theories is that of what the traffice will bear.

> The real meaning of the phrase is, that within the limits already described - the superior limit of what any traffic can afford to pay, and the inferior limit of what the railroad can afford to carry it for- railroad charges for different categories of traffic are fixed, not according to any estimated cost of service, but roughly on the principle of equality of sacrifice by the payer. So regarded, (the principle ) 'what the traffic will bear' is a principle, not of extortion, but of equitable concession to the to the weaker members of the community. ---- Translated into railway (economics) language, the principle means this: the total railway revenue is made up of rates which, in the case of traffic unable to bear a high rate, are so low as to cover hardly more than actual out-ofpocket expenses; which in the case of mediumclass traffic , cover both out-of-pocket and an a proportionate part of the unapportioned cost; and finally, in the case of high-class traffic , after covering that traffic's own expenses, leaves a large and disproportionate surplus available as a contribution towards the unapportioned expenses of the low class-traffic, which such traffic itself could not afford to bear.

The same author notes that the policy of charging what the traffic will bear is almost universally accepted. (1) Probably the best example of the actual working of the principle is found in Professor Hadley's book on railroad transportation.(2)

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(1) Acworth, W.M., The Elements of Railway Economics, p. 77.
(2) Hadley, A.T., Railroad Transportation, p. Putnam & Sons New York and London, 1885.

## RATE THEORIES OF THE INTERSTATE COMMERCE COMMISSION

The act intitled "An Act to Regulate Commerce" was approved on February 4, 1887 and accordingly as provided in Section 24 of that act, the provisions of sections eleven and eighteen relating to the appointment and organization of the Commission went into effect at once and the remaining provisions took effect sixty days after the passage.

The leading features of the act are the following:

> All charges made for services by carriers subject to this act must be reasonable and just. Every unjust and unreasonable charge is prohibited and declared to be unlawful.
>
> The direct or indirect charging, demanding, collection or receiving for any service rendered a greater or less compensation from any one or more persons than from any other for a like and contemporaneous service is declared to be unjust discrimination and is prohibited.
>
> The giving of any undue or unreasonable preference as between persons or localities or kinds or traffic or subjecting any one of them to undue or unreasonable prejudice or disadvantage is declared to be unlawful.
>
> Reasonable, proper and equal facilities for interchanges of traffic between lines, for receiving, forwarding, and delivering of passengers and property between connecting lines is required, and discrimination in rates and charges as between connecting lines is forbidden.
>
> It is made unlawful to charge or receive any greater compensation in the aggregate for the transportation of passengers and property under substantially similar conditions and conditions for a shorter than for a longer distance over the same line in the same direction, the shorter being included within the longer distance.
>
> Contracts, agreements or combinations for the pooling of freights of different and competing railroads, or for dividing between them the aggregate or net earnings of such railroads or any portion thereof are declared to be unlawful.
>
> All cariers subject to the law are required to print their tariffs for the transportation of persons and property, and to keep them for public inspection at every depot or station on their road. An advance in rates is not to be made until after ten days public notice, but a reduction in rates

may be made to take effect at once, the notice of the same being immediately and publicly given. The rates publicly notified are to be the maximum as well as the minimum charges which can be collected or received for the services respectively for which they purport to be established.

Copies of all tariffs are required to be filed with this Commission which is also to be promply notified of all charges that shall be made in the same. The joint tariffs of connecting roads are also required to be filed, and also copies of all contracts , agreements or arrangements between carriers in relation to traffic affected by the act.

It is made lawful for any carrier to enter into any combination, contract or agreement, expressed or implied to prevent by change of time schedules, carriage in different cars or by other means or defices, the carriage if freights from being continuous from the place of shipment to the place of distribution.(1)

These are the most outstanding provisions of the act. Special mention should be made of the section of the act which makes a number of remarkable exceptions, that is section 22.

Section lland 12 creates the Commissionsand names its duties. It shall consists of five commissioners to be named by the President and Senate to serve for six years, one retiring each year. The commissioners are not to be in any way financially interested in any of the businesses subject to the act. They shall not engage in any other business and it shall be their duty to execute the probisions of the act.

By induction it seems that one may arrive at the theories of the rate making held by the Commission and that such theories based on long experience must indeed be very valuable.(2)

In its first report the Commission laid down what it

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(1). I.C.C. Report (1888)
(2). Railroad Rate Theories of the Interstate Commerce Commission by M. B. Hammond, Quarterly Journal of Economics (1900) vol. XXV. This discussion is based largely on Mr. Hammond's article

considered some of the most outstanding factors in determining a reasonable rate. In their discussion of "classifications" the Commission discussed the theory of railroad charges for service. They at once condemned the cost of the service theory because of the difficulty of allocating the cost to the several commodities because it

> ---would restrict within very narrow limits the commerce in articles whose bulk or weight was large as compared with their value.(1)

The value of the service is accepted whole heartedly as the true principle to be the determinant of rates. They say;

> Such method of appointment would be left for the country because it would enlarge commerce and extend communication; it would be left for the railroad, because it would build up a large business, and it would notbe unjust to property owners who would then be made to pay in some proportion to benefits received.(2)

Classification was one of the first problems to face the Commission. In its first report the Commission advised a more uniform classification ot freights as it was the basis of numerous complaints and would greatly facilitate rate making in the country. It even hinted broadly at uniformity, saying,

> The desirability of uniformity is so great that the suggestion is frequently heard that the national legislation should provide for and compell it. If such legislation should be adopted it would be necessary to empower some tribunal to make the classification, and the difficulties which would attend the making would be very great. Relative rates would be involved in it for classification. It was very early in the history of railroads perceived

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(1). First Annual Report of I.C.C. pp. 30-32.

> that if these agencies of commerce were to accomplish the greatest practical good, the charges for the transportion of the different articles of freight could not be apportioned amoung such articles by reference to the cost of transporting them severally, for if the apportionment of cost were possible it would restrict within certain very narrow limits the commerce in articles whose bulk or weight was large as compared with their value.(1)

Continuing in this strain, the Commission further justifies its stand in favor of the value of the service principle, saying:

> It was therefore seen not to be unjust to apportion the whole costs of service amoung all the articles transported, upon a basis which would consider the relative values of the service more than the relative cost of carriage. Such a method of apportionment would be best for the country because it would enlarge commerce and extend communication; it would be best for the railroads because it would build up a large business, and it would not be unjust to property owners, who thus would be made to pay in porpotion to the benefits received. Such a system of rate making would in principle approximate taxation, the value of the articles carried being the most important element in determining what shall be paid on it.(2)

The Commission observed that the most frequent of complaint were, the lack of steadiness in rate, the disproportion between the charges for long and those for short distances, the great disparity between the charges made by roads differently circumstanced as to advantages, and the extremely low rates which are compelled by compitition in some cases, and which may make rates which are not unreasonable seem on comparison extremely high. Such rates in turn are due to several factors. These include the length of haul(it is as easy to move a hundred miles

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(1). Workings of Interstate Law - A. T. Hadley, Quart. Jour. of Econ. vol. 2 (1888), p 177. Also see Report of Interstate Commerce Commission, pp, 63-64.
(2). I.C.C. Report (1887); also see Taussig's article on "Joint Costs" in Ripley's "Railroad Problems"; also Prof. Cohn's "Taxation Theory of Rates".

as ten), the quantity hauled, freight for return hauls, and the relative costs of moving trains.(1)

The Commision does not attempt to say in what manner it would measure the value of the service though we get some idea from the decisions rendered by this body. It was early held in one of the Standard Oil cases that :

> The effect of transportation upon market value is taken into account by carriers in making rates.(2)

Again it was held in a later case that:

> The value of the service to the shipper in a general sense is the ability to reach the market, and to make his commodity a subject of commerce.---In a more definite and accurate sense it consist in reaching a market at a profit being in effect what the traffic will bear to be remunerative to producer or dealer.(3)

It would seem that the Commission was measuring the value of the service by determining the difference in market value of the commodity at the point of shipment and at the place of unloading. As previously pointed out in this paper this difference in the long run is determined by the railway rate. This reasoning seems to lead one in a circle and as Mr. Hammond points out was in reality only a truism to the Commission.(4) On this very point the Commission states :-

> The price of farm products at railway stations is usually the market price in Chicago, St. Louis, New York, or other markets to which shipment from such station are usually,made, less transportation charges and commissions.(5)

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(1). See Southern Railway and Steamship Associations, by Henry Hudson, Quart. Jour. of Econ. for a discussion of railroad agreements on rates before 1887.(Vol. 5, p. 70).
(2). Rice vs. L.& N.R.R.Co. I I.C.C.Rep. 503.
(3). Imperial Coal Co. vs. Pittsburg & L.E.R.R.Co. 1 I.C.C.Rep
(4). 4 I.C.C. Rep. 116. 3 I.C.R. 94, i.e. Alleged Excessive Freights Rates and Charges on Food Products.

It would seem that though the value of the service was by proclamation the basis of determining rates, yet in the Commissions decisions "what the traffic would bear" was the principle actually applied. Of course what the service is worth or what the traffic will bear varies as we view it from the viewpoint of carrier to shipper and consumer.

As previously pointed out in this paper the value of the service tends to be a subjectice standard and is of little value in actual solution of the rate question. As Mr. Hammond puts it:-

> The term "value of the service" may have some importance as an expression th an ideal relationship which should exist between railway rates, but it will not, in many instances at least serve as a definite standard by which railroad rates may be measured and compared.(1)

However, it shoule be observed thom these few statements that from a study of the Commission's decisions we can expect to find that a "single principle has been used by the Commission for solving all rate problems; as at any rate, if the Commission insists on their statement that "value of service is the underlying principle in all cases this principle is used in such a broad sense that it may inslude a variety of considerations any one of which may at times be the leading factor inthe Commissions decisions. Opinions may differ somewhat as to the best way fo stating the factors involved. By the present writer they have been classified as follows: (1) the relative

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(1). Rate Theories of Interstate Commerce Commission.
M. B. Hammond Q. Jour. of Econ. Nov. 1910

values of the commodities transported; (2) the relative cost of transporting the commodoties; (3) the relative distance the articles are carried; (4) the relative natural advantages of location possessed by various places; (5) the special and peculiar interests of a given section or a given class of producers; (6) the importance of maintaining competition; (7) the extent to which a given rate tends to yield a fairn return on actual capital investment".(1)

It seems to the author quoted above that these have been the standards by which the Commission has consciously or unconsciously used in deciding the cases coming before it for the determination of a reasonable rate. Needless to say, many cases involved several of these points. Yet this would be the same as treating several cases and would contradict what has been said. By such a review of the decisions of the Commission it is believed that it may be shown that some one of the above statements stand out as primary with the others only as secondary determinants of a reasonable rate.

As previously stated the Commission held the value of the article carried the guiding principle in rate making, saying ;

> The value of the article carried is the most important element in determining what shall be paid on it. (2)

Practically the same position was held in the second Annual Report where it was held that value of the service

> would seldom be burdensome to articles of high

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(1). Theories of Rates of Int. Com. Com. Hammond Q.J. of Econ. vol. 25 p. 10. 1910

(2). First Annual Report of I. C. C. pp. 30-32.

value, but it would relieve cheaper articles from burdens which if apportioned strictly to cost to the carriers of their transportation would render carriage for considerable distances out of the question.(1)

In his treatment of the subject Mr. Hammond analyzes the several types of cases which have come before the Commission. Thefirst deals with rates on commodities "closely related in character and frequently competitive with each other in the open market". He further divides this group into "articles offered for transportation in different stages of manufacture" and "articles that do not represent the same commodity but are nevertheless substitutes for each other and the transportation rates might easily determine which commodity should be used".

In the first sub-group we find the case of rates charged on "hub-blocks" used in the manufacture of wheels but upon which "only so much labor has been expended as in needful to put them into condition for seasoning". It was found that the defendant carrier had classed the hub-blocks as fifth class traffic. It was proven that a carload of hub-blocks had a value of only $280 while a carload of hubs turned out yet not mortised, was worth $5000. As a result of these findings of difference in value at different stages of manufacture, the Commission ordered that the hub-blocks be placed in the sixth class and required the same rates as given lumber.(2)

Similarly in the case of Murphy, Wasly & Co. vs. Wabash

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(1). Second Annual Report of I.C.C. p. 35.
(2). F. L. Hurlburt vs. L.M.& M.S. Ry. Co. 2 I.C.C. Rep. 122
2 I.C.C. R. 81.

R.R. Co. etal a like decision was reached. The defendants were charging the same rate on chair materials from Detroit to Omaha as they were charging for finished chairs. The value of the respecteve commodities was only $7 per dozen chairs at Detroit while the value of finished chairs was $28 a dozen at Detroit and $20 at Omaha.(1)

Again, in a case not unlike the above the Commission expressed the opinion that unfinished bedroom suits should be given a rate equal to not more than 85% of that granted to finished articles because of "the difference in value of the unfinished and finished furniture, -- and the greater tonnage per carload which can be hauled of the former."(2) However it is seen that the element of cost is also a determinant in the latter two cases.

In a number of cases concerning the relative rates on raw and semi-finished materials the Commission applied the same principles used in the above cases. Accordingly carriers were ordered to cease and desist from classifying hatter's and fur scrappings and cuttings as double first class, while at the same time the finished fur hats were classed as first class in the Official Classification.(3) Obvious enough the cost of the service and competition entered into the making of this decision but the value of the commodity was predominant. In regard to this the Commission says:

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(1). 5 I.C.C. Rep. 122; 3 I.C.C. Rep 725.
(2). Potter Mfg. Co. vs. Chi.& Grand Trunk R.R.Co. 5 I.C.C. Rep.514
4 I.C.R. 233.
(3). Newman vs. N.Y.C.& H.R. Co. et al. 11 I.C.C. Rep. 517.

> We would be inclined to say that fur scrap and cuttings must be rated higher than second class were it not for the claim that of the defendants that this would lead to fraud in the billing of fur and fur scraps---- Hatters fur, the raw material, does compete in a way with hats, the finished product, and we do not think that under the circumstances of this case the rate upon the raw material ought to be greater than upon the finished product.

Likewise on the sane grounds the Commission refused to permit leather scraps and sole leather to be placed in the same class with the same rates, when it had been shown that leather scraps had a value of from 2 to 5 cents a pound while soleleather was worth 25 to 45 cents per pound. It is significant that in this case the Commission adds a cost of service argument to its decision, stating, "liability to damage in scrap is practically nothing".(1)

In regard to charging the same rate on second-hand dynamoes as on niw the Commission held that the carriers could not be forced to adopt a classification that would provide one rate for noe and another for the other. Since it was shown that the second-hand dynamos were for junk purposes and had no other actual value the carriers were Bound to apply the rates offered on scrap iron. The Commission says:

> Its value is no greater than the selling price by the pound of the metal which it contains, not indeed as great since a certain amount of labor must be expended even before that price can be obtained.(2)

In this same case greater cost in handling the new dynamos was also advanced as an argument in arriving at the above decision.

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(1). National Machinery Wrecking Co. vs. P.C.& St.L.Ry. Co. et al 11 I.C.C. Rep. 581.

(2). Page etal vs, D.L. & W.R.R. 6 I.C.C.Rep. 148; 49 I.C.R. 525.

> [illegible]

[illegible]

[illegible]

> [illegible]

[illegible]

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(1) [illegible]

(2) [illegible]

In the case where the defendant railroad was charged with putting a different rate on window shades than the material from which they were produced, the Commission apparently reversed the value of commodity principle at first, saying:

> The items of similar bulk weight, less value and risk of carriage, and important volume of traffic, are all in the direction of giving window shades a classification as low as that which is provided for window hollands.

The facts of the case showed that the defendant carrier had been classifying window in class one and window hollands in class three of the Official Classification. When the U. S. Circuit Court refused to enforce this order on the ground that it "applied to shades having very high value as to the cheaper varieties, the Commission gave the case a re-hearing and issued a new order. This order permitted the carriers "to restrict their transportation of window shades at third-class rates to those limited to a specified maximum valuation at the point of shipment", thus strengthening the value of the commodity principle.(1)

The Commission held in the Michigan Box Co. vs. F. & P. M. R.R. Co. etal, that a rate on box shooks higher than that on lumber was unjustifiable since the evidence presented showed that the weight of a carload of lumber was 36,000 pounds and its value was from $350 to $800, while the weight of a carload of box shooks was about 30,000 pounds and its value only $220.(2)

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(1). 6 I.C.C. Rep. 548
(2). 6 I.C. Rep. 335

A number of cases have been before the Commission in which the question concerned the relative rates on cereals and their products. In most of the cases competitive conditions were the main arguments involved but to a certain extent a difference in value intered into consideration as justifying a higher rate on the more valuable. The Commission's attitude seems apparent in its dicision of the question on a differential between aoen and cornmeal shipped from Missouri River points to Louisiana in regard to which it said:

> The Commission has as a rule approved a reasonable difference between any raw material and the manufactured article, but when the amount of labor, and increased value, and extra risk, were so comparatively insignificant as upon grain whole and grain ground, it is not found that any very great extra freight charge was warrented by needs of the carriers, as a protection to any industry or just to the consumer and wherever the carrier has seen fit to waive its privilege of a slightly advanced rate for the carriage of its product, and the rate on the raw material was reasonably low, the Commission has not interfered with that discretion.

In a similar case a differential of 3 cents per 100 pounds as above the rate on corn was allowed in the movement of corn from the Missouri River to points in Texas.(1) Cost of service was also advanced in this case. On the same ground as above cited the carriers were permitted to grant a 5 cents differential to corn bound to the Pacific Coast.(2)

Tje Commission recognized a sufficient difference in value between cream and milk to justify a charge of 45 cents

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(1). 11 I.C.C. Rep. 220
(2). 11 I.C.C. Rep.210

per can for tramsporting cream and only 35 cents for milk. In this case also a higher charge was warrented for transporting cream on the ground of greater risk and cost.

The evidence in the case of Chicago Board of Trade vs. C. & A. R.R. Co. etal(1) showed that the defendant carriers were giving lower rates on packing house produce from Sioux City, Iowa, and other western packing centers to Chicago than they were giving on live hogs shipped to the same market. They maintained that (1) higher costs of service, (2) the larger traffic in packing house products and the materials used in these houses such as salt, etc., which furnished return cargoes in part; and (3) the necessity of protecting vested interests of the packing industry in the west justified the discrimination between the rates for live hogs and packing house products, in favor of the farmer.

In its decision denying the justification to discriminate as described above the Commission held:-

> As certain articles of commerce, the evidence showd without conflict that the live hog and its productss are in direct competition with each other. This only brings out in a stronger the discrimination that is made against the traffic in the live hog as compared with the traffic of the products. Of the two the product is very much more valuable; it is transported at more expense to the carrier.

On account of the competition factor between western and Chicago packers, the Commission did not as we might expect order a lower rate on hogs, but said:-

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(1). 4 I.C.C. Rep. 153; 3 I.C.R. 237.

> rates made by them on live hags should not be greater than upon packing hluse products.(1)

It should be noted that the railroads in question had defended their practice on the grounds of "(1) higher cost of service in the case of live hogs; (2) larger traffic in packing-house-products, and the materials used in these houses, such as salt, rice, etc., which furnished return cargoes in part; and (3) the necessity of protecting vested interests, since large investments had been made in the western packing industry, based on the expectation that lower rates were to be given its products". The Commission found none of the points sufficiently borne out in the evidence to justify the discrimination in favor of dressed pork.

In the case of the Chicago Live Stock Exchange vs. C. & G. W. Ry. etal, (10 I.C.C. Rep. 428) practically the same issue as stated in the above Live Stock Exchange case existed, compoicated by the fact that certain roads had extended their lines beyond the Missouri River while certain others extended only to the river. "The roads extending beyond the river were inclined to establish such rates as would favor the traffic in live stock since in this way shipments to Chicago would be entirely over their lines.

The roads terminating at the river were, on the other hand, inclined to establish such rates as favored the traffic in live stock products; since if the animals were unloaded and slaughtered at the Missouri river towns, these lines would share in the shipment of the products to Chicago and the East."

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(1). Chicago Board of Trade vs. C.& A. R.R. etal., 4 I.C.C. Rep. 153; 3 I.C.R. 233.

It is evident then, that the real cause of discrimination was competition between the two sets of roads. In this case, too, the defendant road offered the claim of greater cost in the case of slaughtered meat, as its justification for the lower rate on live stock. To this the Commission replied;

> Although we think cost in transportation is an important element, we do not consider it a controlling factor in this case---- In determining what the relation should between the rates charged for transporting two different freight articles, value is often an important factor, but this is not alone because of the greater risk connected with the transportation of the more valuable article. Improvements made during recent years in the roadbeds and equipment of carriers have rendered the item of risk in many cases of little consequence. The value of the article is important, principally, because of its bearing upon the value to the shipper of the transportation service; and the value of the service is, and always has been considered by carriers one of the important elements to be considered when fixing the rates to be charged for transportation. As stated in the finds of fact, live stock products, compared with live animals, are about twice as valuable.

The Commission did not, however, follow this to its logical sequence but owing to the competition between the two commodities, deemed it wise to make equal rates on each.

In the case of Shipper's Association of Northwest Iowa vs. the Illinois Central Railroad Company etal, besides numerous other complicating elements much stress was laid on the value of the commodity. The Association called atention to the fact that rates on grain were so high as compared as compared with rates on hogs and cattle, that it seemed that such rates "favored the farmers who fed their grain and shipped the live stock, and thus discriminated against the small farmers, and tenants who could not afford to carry stock for feeding". Thus form

this angle, as Mr. Hammond notes, the question concerns "what shall be the rates on raw materials, (grain) as compared to those on its manufactured products (hogs and cattle)."

The roads replied that "ideally" the above reasoning was correct but the "actual conditions of competition prevented the roads in question from following this since "competition was the controlling consideration". Although admitting to a certain degree the claim of the roads the Commission held that the relation between the two was "especially unfair". It was shown that between 1887 and 1898 that decline in sale on live stock had been much greater than on grain and the Commission held:

> We are of the opinion, too, that the rate on live stock at the present time is lower in proportion to the service rendered than that on grain.

In regard to certain commodities competitive in character the Commission has made a number of interesting decisions in which the value of the service was a outstanding element. It was held that Pearline should not be discriminated against by placing it in the forth class while common soap was in class six. Instead it held that Pearline should be placed in class five and that common soap should remain in class six. In its decision the Commission said:

> The very great difference in value and also the risks in case of serious accident in the transportation of Pearline as compared with common soap would indicate that that there is ground for a reasonable difference in the freight rates on those two articles. (1)

(1). James Pyle & Sons vs. East Tenn. & Ga. R.R. CO.
1 I.C.C. Rep. 465

The value of the commodity is again the controlling factor in the case of Coxe Bros. vs. the Lehigh Valley R.R. Co.(1) In this case the complainants asked that their bituminous and anthracite products be given the same rate, which petition the Commission failed to grant on the ground that (1) "the value of the anthracite coal was greater and therefore the service of transporting it was worth more to the shipper; (2) the shorter distance from the mines to the principal market in the case of anthracite rendered its transpertation per ton-mile more expensive". For the same reason, a difference in value, the Commission permitted a different slassification between "soft and lump coal used only for domestic purposes, and mine-run, nut, mill and slack coal used only for steam purposes".(2) Likewise paper bags made of cheap grade of paper were permitted to be placed in a lower classification than envelopes, though cost of transporting the bags was less as shown by the complainant(3

In one of the Standard Oil cases(4) "the carrier was ordered to charge only on the basis of the weight of the oil carried in barrels when it charged for oil only, if carried in tanks and not to charge barrel shipments on the gross weights".

In regard to that class of decisions in which value

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(1). 4.I.C.C. Rep. 533; 3 I.C.R. 460.

(2). Mc Grew vs. Missouri Pac. Ry. Co. 8 I.C.C. Rep.630

(3). Wolf Bros. vs. Alleghany Ry. Co. etal. 7 I.C.C. Rep.160

(4). Rice, Robertson and Winthrop vs. Western N.Y. & Penna. R.R.Co. 4 I.C.C. 131; $ 3 I.C.C.R. 162.

of the commodity was an outstanding feature Mr. Hammond cites a number of cases. Thus the first case of non-competing commodities which were sufficiently similar to be treated alike, was the decision ordering that lumber and railroad-ties be placed in the same class since their value and the conditions of transportation were similar.(1) For similar reasons raisons were held to be discriminated against by being placed in a higher class than California dried fruits since the market value of the rasins was the lower,(2) as was the holding placing celery in the same classification as other like vegetables (e.g. cauliflower, asparagus, etc.)(3) on the ground celery had come into more extensive use since the first classification.

The same author cites one singular case in this regard which is better illustrated by a citation from the decision of the Commission, which said;

"As a barrel of cabbage is three fourths of that of a barrel of potatoes and its price or value only one half (two fourths) it would seem that there is a difference of one fourth in the favor of cabbage. This is upon the assumption that bulk and value would operate equally in proportion to amounts in enhancing rates. Our conclusion is that the rate on cabbage from Charleston shoule be one-fourth less than the rate on potatoes".(4)

The Commission has at times regarded the use the

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(1). Reynolds vs. Western N.Y.& Penna. Ry.Co. etal., 1 I.C.C.Rep.393 I.C.R. 686.

(2). Martin vs. Sou. Pacific Co. etal., 2 I.C.C.Rep. 1; 2 I.C.R. 1.

(3). Tecumseh Celery Co. vs. Cin. Jackson & Mackinaw Ry. Co. etal. 5 I.C.C.Rep. 633; 4 I.C.R. 318.

(4). Truck Farmer's Assn. of Charlestonand Vacinity vs. Northwestern

commodity is to serve in its decisions, thus accounting for a higher hate on cow peas than common commercial fertilizers, since such peas were not only more valuable but were used as an enricher of the soil and its blades were fed as cattle food.(1) The result of a similar ruling was the placement of the "Scheidel outfit", and electrical apparatus, mainly employdd in the production of the Xray in the first class with medical and scientifid instruments,with double first class rates in the Official Classification.(2) This discussion of the value of the commodity as a basis of the Commission's decisions may be well summed up in the case of Rice vs. Cincinnatti, Washington and Baltimore Railroad Co. etal(3) where the Commission said:

> In respect to the methods and cost of transportation these commodities (cotton-seed-oil and terpentine) have a notable resemblance to petroleum products, and the cheapest of them is several times more valuable than illuminating oil----Notwithstanding the comparatively low value of refined petroleum, the amount exacted for its transportation is in some instances 60% greater than the sum accepted for carrying cotton-seed oil between the same stations. It is impossible to reconcile such inconsistant charges. The cotton-seed oil rate, in the cases referred to is not forced upon the railroad, and it must, therefore be presumed to be remunerative; but of the lower rate for the higher priced article is reasonable to the carrier, how can the higher rate for the lower priced article be reasonable to the shipper.

It seems that the Commission has had in mind the market value and not the intrinsic value as witnesses certain of its decisions. Thus in Warner vs. N.Y.C.and H. R.R. Co. etal,(4)

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Ry. Co. of South Carolina etal. 6 I.C.C.Rep. 295

(1). A. G. Swaffield vs. Atlantic Coast Line R.R. Co.etal. 10 I.C.C. Rep. 281

(2). W Scheidel & Co. vs. Chi. & N.W. Ry. Co. etal. 11 I.C.C.Rep.530

(3). 5 I.C.Rep. 193; 3 I.C.R. 841

(4). 4 I.C.C. Rep. 32; 3 I.C.C.R. 74.

in speking of "the modes of packing, the methods of handling, the risks of transportation," of beer and ale as compared with a certain patent medicine. In regard to the relative values of the two the Commission held that since the market value of a carload of the patent medicine was $5400 while a carolad of beer or ale sole for about $1800, the defendant was justified in classing patent medicine in first class for less than carload lots and third class for carload lots, while at the same time placing beer and ale in third and fifth classes as it happened to be in less than carload lots or carload lots respectively. The commissioners said:

> The value of an article to the manufacturer is the price it commands and it seems only reasonable that the carriers should take into account the market value, a thing generally known and easily ascertained, as one of the conscilliations in arranging their classifications and fixing the rates a commodity should bear, It is not seen that the relations that any specific commodity whould bear to other commodities for classification purposes can be arrived at in any other practical way.

The same distinction was made in the case where a manufacturer who advertises his soap as a toilet soap yet sought laundry soap rates thereon as it was of the same grade. The Commission held that the price he was seeking the market was the determining factor in the valuation of the soap.(1)

In certain cases where value of the commodity was figured the Commission has taken certain social conditions into consideration. In regard to fixing hay rates the commissioners say:

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(1). Andrews Soap Co vs. Pittsburg, Cincinatti and St. Louis R.R. etal. 4 I.C.C. Rep. 41; 3 I.C.R. 77.

> When the market price yields but scant return for labor and expenses of production, the cost of transportation needs to be as moderate as will be consistent with justice to the carriers.(1)

Again, in the hay case, National Hay Association vs. Lakeshore and Michigan Southern R.R. Co. etal.,(2) the same view was held. Still again, in the case of extensively used steel products as rails and building steel, it was held that the roads were justified in giving a low rate.(3) It was further held in regard to the same products that a reduction in times of low market prices in the same was justifiable, but that the roads might again advance rates on a return of the normal market price.(4) It was held as previously stated, that the rates on the lower priced grains (as oats and corn) should bear a lower rate than wheat.(5) Where the commodity has a low market value and is extensively used the Commission has taken cognizance of this fact.(6)

The same general principle of value has entered into the question of passenger rates to some extent as witnesses

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(1). Behmier vs. Memphis & Charleston R.R. Co. etal., 6 I.C.C. Rep. 257; 4 I.C.R. 870.
(2). 9 I.C.C. Rep. 264.
(3). Colorado Fuel & Iron Co. vs. Sou. Pac. Co. etal; 6 I.C.C. 488.
(4). In the matter of proposed advances in freight rates. 9 I.C.C. Rep/ 382
(5). 4 I.C.C. Rep. 48; 3 I.C.C. R. 93.
(6). 6 I.C.C. Rep. 520.
Delaware State Grange vs. N. Y. Phila. & Norfolk R.R. Co. etal; 4 I. C. C. Rep. 558; 3 I. C. C. R. 554.

the case in which the Commission "upheld certain roads in their practice of putting immigrants into a special class and giving them lower rates than were accorded either to first or second class passengers,,and in their refusal to sell tickets to other persons at the same rates as were given to the immigrants even though these persons were willing to ride in the immigrants cars.(1)

It appears then that while the Commission " referred to the principle of the value of the service as influential in determining the rate ,they have never insisted that charge should be proportional to the values of the commodities. "Usually other elements have been the cause of the use of value as risk to the carrier, necessity that competition be preserved by considering relative values of competing commodities, the relative values of finished and unfinished goods, and in a few cases as stated above social and economic considerations have been recognized. It would seem that Professor E. R. Johnson is hardly justified in believing value as a basis will be increasingly used as government regulation increases.(2)

Before 1891 a great number of cases had been decided bythe Commission, into which costs were a consideration.(3)

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(1). Ry. Rate Theories of I.C.C. Hammond Q. J. Econ. vol.25 p. 39
(2). Saney vs. N.Y.C. & H.R.R. Co. etal; 2 I.C.C. Rep. 338.
(2). American Ry. Transp. p. 281. Cf. "Principles of Govt. Rebulation of Railroads, Polit. Science Quart, Vol. 25,46-47
(3). In re Louisville & Nashville Railroad Co;
Boston Chamber of Commerce vs. Lakeshore and Michigan Sou.Ry.Co.
Evans vs. Oregon Ry. and Navigation Co.;
McMoran etal vs. Grand Trunk Ry. Co. of Canada etal;
Thurber etal vs. N.Y.C. Hudson River Ry. Co. etal;
Legget vs. same;
Greene vs. same;
Lehman & Higgenson Co. etal vs. Southern Pacific Co. etal;
In re alleged excessive freight rates and charges on food prod.

It may be well to review a few of these earlier cases to observe such considerations as was given cost in the determination of a reasonable rate.

In Boston Chamber of Commerce vs. Hudson River Railroad it was held: (1888)

> That the relative reasonableness of rates on shipments from western points to cities on the Atlantic seaboard is to be determined by all circumstances and conditions that affect the traffic to respective points between which the rates are questioned and not solely one standard of comparison. ----The length and character of the haul; the cost of the service; the value of the commodity; the conditions of th competition; the storage capacity and geographical situation at different terminal points are all elements of importance bearing upon the relative reasonableness of the respectivee transportation.

The recognition that there is no single standard was thus early made and continues to be the opinion of the Commission. The same view is evident in the following decision:

> The method of thsting freight rates of a railway by the rate per ton-mile is one by which these rates may be brought down to the narrowest point of scrutiny and is in this sense valuable, but it is like looking at them with a microscope, for it ignores all other tests except that which it alone furnishes and does not take into consideration any of the surronding circumstances and conditions that enter into the making of the rate no matter how cumpulsory or imperious these may be and for this reason it cannot be considered a controlling rule in determining the reasonableness of rates.(1)

At another point the(2) Commission says:

> In determining what is a just and reasonable rate

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Mfgrs and Jobbers Union of Mankoto vs. Mineapolis and St. Louis Ry. Co. etal
Board of Trade of City of Chicago vs. Chicago and Alton Ry.Co.;
Bates vs. Penna Ry. Co. etal;
N. Y. Board of Trade and Transportation etal vs. Penna. Ry.Co.;
W. S. King & Co. vs. N.Y., New Haven and Hartford Ry. Co. etal
(1). Business Men's Assoc. of State of Minnesota vs. Chicago, St. Paul, Mineapolis and Omaha Ry. Co.
(2). I.C.C. Report (1889) p. 229.

for a particular commodity (for example, wheat) the Commission will take into consideration the earning and expenses of operating, rates charged upon the same commodity upon other roads as nearly similarly situated as possible, the diversities between such other roads, etc.

Again in a later report the Commission says:

> Rates are never measured exclusively by weight of the articles carried, or by bulk, or cost to the carrier of transporting them, or by the value to owner in having them transported; and if all of these and others are taken into account in the determination fo rates as they virtually are, there is no rule by which can be determined how much importance should be attached to any one or any combination of them.(1)

In Andrews Soap Co.vs. Pittsburgh, Cincinnati and St. Louis Ry. Co. etal(2) it was held that:

> In fixing reasonable rates the requirements of operating expenses, founded on fixed charges, and dividends on capitol stock from the fotal traffic(3) are to be considered, but the claim that any particular rate in to be measured by these as a fixed standard, below which the rate may not be lawfully reduced is one rightly subject to some qualifications one of which is that the obligations must be actual and in good faith.

In the same year the Commission said in regard to classification:(4)

> An important question is, what is the probable cost of carriage of the articles severally, and each is expected to be so classed that the rate it would bear would be such as to cover this cost and also afford some profit to the carrier.

It continues by further discussion tof the possibility of ruin to industry if this policy was relentlessly followed with regard to bulky commodities.

It is noteworthy that in its report of 1890, the Commission

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(1). I.C.C. Report (1890), p. 14
(2). 3 I.C.C.
(3), Recognizing cost as an ultimate basis.
(4). I.C.C. Report (1890)

complained of its lack of authority to execute its decisions, and hthe fact that its findings of fact were not conclusive, but subject to the review of the courts. Moreover, new evidence could be and usually was introduced. "A very common assumption by parties connected with railroad service is that the question of reasonableness of rates is one of law, and therefore, the decisions of the Interstate Commerce Commission must at all times, when rates are involved, be subject to review".(1) It notes rightly that the courts are prone to pass on the one rate neglecting the fact that it is a part of a system of rates which should be considered before a change may reghtly be justified. As early as this (1890), "what the traffic will bear" was discussed by the Commission, indicating "the maximum charge though often used in the opposite sense".

The nearest approach to a rule for determining a reasonable rate to this time appears to be "that rates must not be made so low that carriers would be seft unable to pay interest on their obligations and something by way of dividends to stockholders after maintaining the road in proper condition and paying all remaining expenses".(2) Here again,is the cost plus a fair profit idea. The Commission maintains that there can be no standard of expenses and cites cases of railroads which would rever be able to pay their obligations yet operate to the benefit of the country they serve. Carriers can best make ratesnot "merely by

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(1). I.C.C. Report p. 10-15, (1890). (Also see Ripley's Rates and Regulations, and Johnson and Van Metre, Railroad Transportation.

(2). Ibid.

the question of cost to themselves and value to the owner of the property carried but every consideration of a public nature which can fairly bear upon the question of public usefulness. The whole subject is one exclusively one of discretion with railroad managers and the officials of associations who are brought directly in contact with the business itself and with the people whom they serve, that they are not expected to refer to legal counsel upon questions of classification but could assume that such a question was altogether aside from this proper service and would be much more likely to consuly with merchants, manufacturers and others who are to be patrons of these roads than with one whose business was to deal with legal questions and not with questions of discretion and purely business managemant.(1)

In regard to cost as a basis for railroad rates, the question of determination of such costs immediately arrises. Professor Hammond declaes that "if the theory of costs of service is empooyed in explaining the principle of railway charges, the term "cost" must, undoubtedly, be used in the sense of joint costs.(2) The Commission early held that the cost of service principle was not applicable to railroad charges. "While cost, as it has been said is an element to be taken into account in the fixing of rates and one of the very highest importance, it cannot, for reasons well understood, be made the rate-basis, but it must in any case be used with caution and reserve.

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(1). I.C.C. Report (1890) p.169

(2). Railway Rate Theories of the I.C.C. Hammond- Q. J. of Ec. vol. 25 p. 40; Taussig in Q. J. of Econ. vol 5 pp. 438-65. Reprinted in Ripley's "Railway Problems", pp. 127-44

This is not merely because the word 'cost' is made use of in different senses when applied to railroad traffic, it being often used to cover merely the expense of loading, moving and unloading trains, but also because in whatever sense may be used, it is quite impossible apportion with accuracy the costs of service amoung the items of traffic----- Any attempt to apportion the costs, therefore would at best and under the most favorable circumstances would only reach an approximation. This is so well understood the world over that the proportion from time to time is made in other countries to measure the charge of the carrier by the costs of the carriage solely, have always been abandoned after investigation".

It seems that though traffic managers and the Commission as well denounce cost as a rate basis, yet "it is somewhat surprising to find that in defnding rates which have been made the subject of complaint to the commission railway officials and railway attorneys have frequently--perhaps most frequently--done so by use of costs of the service arguments. Even more surprising, however, is the fact that the commissioners have not only lent a willing ear to such arguments and sustained them whenever the evidence seemed to support them, but they have very frequently on their own initative entered into an investigation of the costs of the transportation with a view of rendering a decision on the basis of the ascertained by this investigation".(1)

It seems not to have been the design to either use costs as the sole basis or to allocate cost by different commodities,

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(1). Hammond, "I.C.C. Rate Theories". Q. G. of Econ. Vol. 25 p. 41.

This is not used

"but the cost of the service has never theless been used as a means of determining the reasonableness of rates in four different classes of cases".

The first type of cases under the above head is the "cost of rendering some specific service". In John P. Squire & Co. vs. The Michigan Central Railroad Company etal(1) the question of charges on live stock and slaughtered meat arose as in the Chicago Board of Trade and Chicago Live Stock Exchange cases, previously cited. The plaintiff was engaged in slaughtering hogs near Boston. For some time the roads had given him a rate of thirty cents per one hundred pounds on live hogs from Chicago to Boston. At the same time The Trunk Line Association had fixed dressed beef rates at sixtyfive cents per one hundred pounds with which price the plaintiff was satisfied also. But following this extreme competition brought rates on beef products to as low as seventeen cents per one hundred pounds with a consequent raising of the plaintiff's business. Evidence showed that practically the only difference of slaughtering of hogs in the Easte and West was the costs of transportation of the live anamals.

Although the plaintiff asked that purely "commercial considerations" not cost of the service be used in this case, the Commission left its "value of commodity" principle and argued that to use this in this case would necessitate a change in the rates for every change on the market of the value of the live hogs in the market.

After an investigation of costs the Commission rendered

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(1). 4 I. C. C. Rep. 611; 3 I. C. R. 515.

the following decision:

> (1) The produce(slaughtered hogs) is carried in more expensive cars---- The interest on the increase origanal cost and the greater outlay for repairs are constant expenses. (2) The weight of the refrigerator car, when loaded with the product, including the ice for refrigeration, is about 64,000 pounds, and that of the live stock when loaded is 46,000 pounds. If the tariff was based solely upon tonnage, that is upon the weight of the car and its load when the carrier charges 30 cents per hundred pounds for carrying live hogs the charge for carrying the product should be about 42 cents per hundred. (3) The loading and unloading of the animals by the shipper instead of the carrier continuing advantage. (4) The rapidity with which the cars used in the live stock traffic are loaded rendered them less liable to detention and they are returned to traffic sooner than when loaded with product. (5) The refrigerator cars have to be iced. Five tons of ice and salt per car furnished in the Chicago--Boston business. This is a constant expense in summer months. (6) The product is more valuable than live hogs.----We are of the opinion that in the fixing of relative rates upon articles strictly competitive as these are, the proper relation should be determined from the costs of the service, and if the difference in this respect between two competitive artecles can be ascertained, such a rule should be fixed for each as correspond to the costs of service. This is fair to the carrier and we believe that the manufacturer has a right to demand of the companies that such a relation of rates as to these articles should be maintained.

The investigation of the Commission in 1902 and 1903 in the case of The Matter of Proposed Advances in Freight Rates,(1) resulted in a permission of that body for the proposed raise rates to the old rate level on dressed beef since in truth it was not a raise but a restoration as the old competition was passed, and since the cost of transporting the beef was expensive to a degree justifying the rate.

In Truck Farmer's Association of Charlston and Vicinity vs. Northeastern Railroad Company of South Carolina et al,(2)

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(1). 9 I. C. C. Rep. 382

(2). 6 I. C. C. Rep. 295.

the Commission justified a higher charge on strawberries than on cabbages and potatoes shipped in bulk, in the following language:

> The rate per ton-mile under the charge above perscribed of six cents per quart will be very much higher than that demanded by the carriers on ordinary freight. Relatively higher rates on strawberries, however, appear to be justified by the exceptional character of the service connected with their transportation. This exceptional service is necessitated by the higher perishable character of the traffic, requiring refrigeration en route, rapid transit, specially provided trains, and prompt delivery at destination. There is also involved in this extra trouble, in handling and receiving and delivering points, extra facilities at such points, the "drilling" of cars in a train, reduction of lengths of train to secure celerity of movement, partially loaded cars, the return of cars empty, and perhaps other incidentals".

In Georgia Peach Farmer's Association vs. Atlantic Coast Line Railroad Co. et al(1) the above decision was followed in general but the Commission was not willing to permit charges to be raised as value increased, for purpose of insurance. It did admit the justification of this point in a subsequent case where it said:

> (Damage in case of live stock) (was) an "incident in the transportation of the commodity which may properly bee taken into account by the railroad in establishing tariffs".

The Commission held in J. K. Farrer et al vs. Southern Railroad Co. et al (11 I.C.C. Rep. 632) that on account of the differences in the cost of service, the road was justified in charging a higher rate on dressed timber-- because:

> The dressing of the timber results in a comparatively important waste of raw material, which is by that amount loss of tonnage to the carrier, a duplication fo terminal expense, a loss of time and increase of expenses by reason of delays in the through shipment to destination.

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(1). 10 I.C.C. Rep. 255.

Many other decisions taking into consideration specific services have been rendered by the Commission(1). Still another group of cases (as noted by Mr. Hammond) is that group in which the commodity being transported is compared with similar commodities, e.g. strawberries as compared with oranges.(2) Again, as regards the relative rates cons corn and cornmeal, the Commission has considered cost(3). In a case of complaint because of rise in the rates on cattle, the Commission agreed that cost should be the basis for their decision saying,

> it is possible to determine with reasonable accuracy the cost of transporting a train of this live stock between any two points(4).

Mr. Hammond cites a type of cases in which rates complained of were compared with the rates elsewhere for a similar service. Here costs were considered again, e. g. the relative cost of transporting cotton from Meridian, Mississippi to New Orleans as compared with the cost of shipping the same commodity from Shreve Port, Louisiana to New Orleans(5).

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(1). 7 I.C.C. Rep. 386.
(2). C. P. Perry vs. the Fla. Cen & Pen. R.R? Co. etal; 5 I.C.C. Rep. 97; 3 I.C.R. 740.
(3). H. Bates and H. Bates Jr. vs. The Mobile & Ohio R.R. Co. 3 I.C.C. Rep. 435.
Board of Railroad Commissioners vs. Atchison, Topeka & Santa Fe Ry. Co., 8 I.C.C. Rep. 304
(4). Cattle Raisers Association of Texas vs. Missouri, Kansas, & Texas Ry. Co. etal; 11 I.C.C. Rep. 296.
(5). New Orleans Cotton Exchange vs. Cincinnati, New Orleans & Texas Pac. Ry. Co. etal; 2 I.C.C. Rep. 375.
Also see Newland etal vs. Northern Pac. R.R. Co. etal; 6 I.C.C. Rep. 131; and
George J. Kindel vs. Boston and Albany R.R? etal, 11 I.C.C. Rep. 495.

Again, the Commission has given consideration to cost in the case of carloads as compared with less than carloads lots(1). In conclusion fo the analysis of cases in which cost has been a factor it seems fitting to note this conclusion of the paper upon whose study the above analysis is based.

> ---It is plain that wefind that the value of the service is merely equivalen to the well-known monopolistic principle of charging that price which will yield the largest net return. It is also evident that the Inte rstate Commerce Commission could never consent to the use of such a principle as a basis for determining reasonable rates. The great advantage which cost of service has over value of service, is that it furnishes a concrete standard of measurement. It states a quid pro quo as a reason for amking a charge. It is a standard of reasonableness which has been adopted in all of our economic relations to make charges less than costs would mean that other commodities or other industries would have to make up the deficiency, or else the railroads of the country would run at a loss. To charge more than costs, or the other hand would mean that the railroad industry was forcing other industries to surrender to it a portion of their legitimate earnings. The fact that it is universally accepted in other transactions as a test of reasonableness explains why the Commission has naturally turned to a consideration of costs when the equity of a given rate has been brought in question, and it also explains why the railway officials have naturally made a cost service their defence when their rates have been attacked. ----That there are obstacles--inseparable ones--to any direct determination of the costs of performing a specific service in transportation no one familiar with the subject will deny, it has been by means of a direct determination of costs, however that the Commission has sought a solution. Them method followed, as we have seen has been that of comparison. This ascertainable cost of moving a certain commodity has been compared with the cost of moving the same commodity in a different manner or under different circumstances. This method of comparative costs does not yield absolute accurate results but it is often sufficient for practical purposes and we must remember that Economics, likelaw, does not concern itself with trifles(2).

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(2). Railroad Rare Theories of The Interstate Commerce Commission, by M. B. Hammond, Quart. Jour. of Econ. (1910) vol. 25, p. 531

(1). C. M. Barrow vs. Jason & Miss. Valley RR. Co. etal, 10 I.C.C. Rep. 333.
Buckeye Buggy Co. vs. The C.C.C. & St. Louis R.R. etal; 9 I.C.C. Rep. 620
W. S. Schofield etal vs. Lakeshore and Michigan Southern Ry. Co. 2 I.C.C. Rep. 90.
Harvard Co. vs. The Penna. Co. etal ;4 I.C.C. Rep. 212.

> In the disposition of rate cases before it, the Commission has always considered the costs of performing various services in so far as the proper statistics were available and applicable. Such application has been limited because of the lack of information, due to the fact that the Commission in recent years has not required carriers to regular apportion their operating expenses to the various branches of the railway service. (This was done prior to 1894, as seen the summaries in "Statistics of Railroads in the United States)--- Many railways now apportion their expenses by class of service on their own initiative. From sixty to seventy per cent. of the operating expensis of railway companies can be apportioned in a satisfactory manner between freight and passenger service.(1)

In view of the revived interest the Commission reconsidered requiring the railroads to separate their expenses. A hearing was held in Washington, D. C., on May 2, 1914 to consider various plans Some railroads asked the Commission for formulas by which to apportion their expenses.

In the report quoted above is found a discussion of allocation of costs under the head intitled, "In the matter of separation of operating expenses", 30 I. C. C. 676. This ruling of the Commission all class one roads embracing carriers whose revenues exceed $1,000,000 per annum, to separate their operating expenses on certain prescribed bases.

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(1). Report of Interstate Commerce Commission, p. 45(1914).

Having followed the trend of the court and the Commission decisions before 1910 and noted the second scene of the situation as set forth in the step of 1914, it is to be noted the the Interstate Commission is laying an increasing stress on cost of service as a factor in ratemaking. (1) So great is this indeed that the "evidence and the briefs presented both by the railroads and the protestants now give special prominence to expense apportionments; and certain firms of accountants have specialized in railroad rate cases." Among the important cases depending on costs for a decision have been the Wisconsin decision of 1907( Buell vs C.M.& St. P. R'y Co., 1 Wis. R.R.Rep., 324) and the Western Passenger Rate Case. In these and in many others the Commission has attempted to allocate or apportion expenses. (2)

As previously stated, the Commission issued the Rules for the separation of operating expenses between freight and passenger serviceson large steam railways. (3) A succeeding section of this paperwill treat this attempt of the Commission to devise a system of accounts to separate freight and passenger expenses. It will be recalled that this requirement had been suspended in 1894. Since this revival of interest in 1914 continued progress has been made, but still many of the old problems continue to baffle and even defy all attempts to allocate or to apportion.

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(1) Five Per Cent Case, 31 I.C.C. 392; Anthracite Coal Case, 35, I.C.C. 220; 1915 Western Rate Case of Advances, 35 I.C.C. 497; Western Passenger Fare Case, 37 L.C.C. 1; Lake Erie Ports Iron Ore Case, 41 I.C.C. 181; New England Milk Rate Case, 40 I.C.C. 699.

(2) Separation of Railway Operating Expenses, Between Passengers and Freight, W.J.Cunningham, Q. J. Econ. Vol. 31. p. 259.

(3) Do Cost oF Transportation Exhibits in Railway Rate Cases Show Costs?, A.S.Olmsted, Anal. Am. Acad.1916, Pub. 973.

## RATE MAKING ABROAD.

The fallacy of analogy is truly a fallacy since analogy is so laden with the danger of comparing the incomparable and drawing conclusions. It has become known as the "patent medicine" argument. However in this brief statement only a general perspective of the rate systems of England, France, Italy and Germany will be considered in an attempt to portray features c common and peculiar to these systems.

British passenger service yields practically one half of the revenues of the British hoads, having increased by about 5.4% annually from 1854 to 1894. The proportion of the total revenue yielded by the passenger service in relation to the total is greater than for any other country in the world

| | 1855 | 1865 | 1870 | 1880 | 1890 | 1900 | 1905 |
|---|---|---|---|---|---|---|---|
| Percentage of passenger receipts to total income | 49.7 | 46.2 | 42.8 | 41.5 | 42.9 | 43.3 | 42.9 |
| Percentage of freight receipts to total income | | | 53.5 | 54.6 | 52.8 | 51.0 | 49.7 |

In their passenger as well as their goods traffic, the British railways have in the main not followed the cost of service principle of rate making. They have usually made rates according to what the traffic would bear,(1) both as to the present and the future. Their managers have, therefore, generally made rates in order to secure traffic. They have understood well that for the most part, it costs less per unit to carry a greater number of units of traffic. In practically no instances, however, have they offered the public a rate so low as not to cover the cost incurred by the railways in hauling the additional traffic. The British railway managers have known that it is most difficult, if not really impossible, to ascertain exactly what each unit of service

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(1). Acwart, Elements of Economics.

> costs; and they have also believed that such a basis of rate making would not be entirely fair, could it be accurately known. They have made rates on the principle of the value of the service, and they have proved that such a principle may be administered with a fair amount of justice to the public."

It amy be noted here that British classification of g freight is very simple still. The act of Parliament known as the Railway Clauses--Consolidation Act of 1845 provided certain maxima which held untilc changes of the Board of Track and Parliament in 1891-92. In this period the railways were practically their own masters in making rates and classifications. The length of their haul is very short, with an average of from thirty-one to fifty miles as compared with two hundred and forty for the United States. The British roads have also a large volume of finished high grade commodities to haul and much of this has to be carried at high speed. Much traffic carried by the express companies and parcel post is carried by the British railways. In connection with length of haul it whould be remembered that the terminal collection and delivery costs are the same for long as for short hauls. The British freight service is not so expensive as it might appear.(1)

In regard to interline traffic the British railways established a clearing house as early as 1842 to manage this traffic. Under this arrangement there sprung up a "clearing-house classification" so that when the Act of 1888 was passed demanding a simpler classification this classification was offered almost "in toto". An unusual provision was embodied in the Act

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(1). Acworth, Elements of Railway Economics. For full discussion see English Railway Rate Question, J. Mavor, Q. J. Econ. vol.8,p.280

of 1894, to the effect that a railroad had to prove the reasonableness of any increase over the actual rates in force on october 3, 1892.

These are some of the most outstanding peculiarities of British railways when comparing them with those of the United States.

In speaking of the Commission created by the Act of 1898, Professor Raper says:

> During the decade of its operation the Commission considered two important classes of cases: (1) Those which involved increases of rates in order to bring an end to an end to an anomalous condition; and in these cases the Commission decided in favor of the railways. (2) Those in which the railways claimed that an increase in cost of operation necessitated an increase in certain rates. Wherever the railways proved that the increase in the cost of service was presumably permanent and in fair proportion to the increase of rate, the Commission allowed the increase.(1)

The above indicates that in justifying changes in rates British railroads often have their claims for charge on the cost basis. Yet the Commission has not laid down a rule on what should determine reasonableness. It must always be proven. Even the decisions of the Commission are not always consistent. Thus the decision that rate competition did not justify a preferential rate to foreign goods over domestic in the Budd case of 1890 was reversed in the Liverpool Corn Trader's Association vs. the Great Western Railway two years later.

It is not entirely far fetched to mention here that the British Commission has done a great service to the Empire and shared a greater dignity than our Interstate Commerce Commission

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(1). Railway Transportation, Raper, p55; also see Control of Railroad Accounts in Leading European Countries, A. M. Sakalski; vol. 24, p. 474.

since few of its decisions have been reversed by higher courts of appeal.(1)

In regard to passenger traffic, it is well to call attentionto the stratification or class system so conspicuous in England and from which this country is far from an exception to the rest of Europe. In England the passinger service recognizes three classes. It is enteresting to note that the tendency has been toward a decrease in class One and an increase in class three until in 1905 this class included 95% of the traffic and 75% of the passenger fares. As observed, this stratification is common to all of Europe doubtlessly due to the social order of that society. So profound an influence has this had on some thinkers that Professor Cohn has set forth his "taxation" or "ability to pay" theory of passinger rates. This is discussed in another portion of this paper.(2)

It should be pointed out that by way of regulation the English government has not prescribed any formula for determining rates but has laid down certain "maxima" between which the companies might shift at their descrition. The same is seen in the system of the "cahier des charges" of France.

In a discussion of French rates it is well to cite as in the case of the United Kingdom the fact that passenger traffic is divided inte three classes in France also. The same tendency

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(1). English Railway and Canal Commission of 1888, S. J. McLean, Q. J. Econ. vol. 70.
(2). Some Curious Phases of the Railway Question in Europe. S. Sterne, Q. J. Econ. vol. I, p. 464.

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[illegible]

of the first class to decrease and the third to increase is evident there too, until in 1905 the first class composed 4.4%; the second 24.7% and the third 70.9%; "and these percentages have not varied greatly in many years".

As to comparative volume of passinger and freight traffic, "in 1900, and this may be taken as a fairly representative year, the passenger service yielded 44.7% of all the income while the freight service's portion was 53.6% with 1.7% from miscellaneous sources".

Classification has been most difficult owing to the variety of commodities composing French traffic. The classification consists of four groups by the concessions of 1842 with prescribed maximum statuatory rates.(1) These remain as the maxima to the present with actual rates varying below such maxima. Such variations are subject to the scrutiny of the Minister of Public Works who supressed them and who for the sake of justice to the shippers and finance to the government, has meant a comparative rigid system of actual rates upon a kilometric basis. The Minister has, however, allowed variations to foster certain local industries against certain imports. As an example of rates on the kilometric basis, "the rates, including taxes, for all merchandise hauled at fast speed were in 1884, upon the lines of one of the efficient companies, The Eastern, as follows:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Up to 200 km. | 40 | centimes | per | ton | (metric) | per | km. |
| From 200 - 300 km. | 38 | " | " | " | " | " | " |
| From 300-400 km. | 35.8 | " | " | " | " | " | " |
| Over 400 km. . . | 33.6 | " | " | " | " | " | " |

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(1). French Method of Contralling Railroad Rates, W. H. Buckler, Q. J. Econ. vol. XX, p. 279.

In regard to the theory behind French rates, Professor Raper says;

> The French classification and skedule of rates have been upon the whole more complicated than those of any other country. They also have been based upon what the traffic would bear(1) -upon the value of service; and this is every where a fairly complicated principle of rate making. There were in 1879, when a reform, for the purpose of securing more simplicity and some reduction in rates, was inaugurated as many as 1854 special traffics. The governemnt now established six classes fo freight traffic for the slow service (petite vitesse), uniformly applicable to all of the companies; and formulated standard rates for each class with variations according to the nature of the goods, their bulk and the distance of their haul. For the fast (grande vitesse) service, the standard rates were now made uniform, though its traffic remained unclassified. Further uniformity and simplification were made in 1892 and 1895. (Attention should be called to tapering rate or bareme as applied to French rates. This is explained in Italian rates also).(2)

Stratification of passenger traffic into four, mostly three classes, is found in Italy as in France and England, the third class in Italy containing about 76% of the traffic in 1899. The kilometric basis of rates already explained in France is common both to freight and passenger traffic in Italy. In 1906 the revision established amoung other things the "tapering system of rates". That is, rates shall increase with distance or length of haul up to a certain limit. Prior to 1906 all rates had been based upon a kilometric basis. Now three divisions were made: (1) distances up to 150 kilometers, (2) from 150 to 1550, (3) beyond 1550. For the first division of traffic all rates were fixed upon a rigid kilometric basis; the field of the second

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(1). French Method of Controlling R.R. Rates, W. H. Buckler, Q. J. of Econ. vol. 20, p. 284.
(2). Control of Railroad Accounting in Leading European Countries, A. M. Sakolski, Q. J. of Econ. vol. 24, p. 789.
For discussion of tapering rates, see Railways in New Zeland, W. W. Stuart and J. E. Llessignot. Q. J. of Econ. vol. 23, p. 652

division was divided into many zones, with tapering rates per zone; the total charge for the third division could never become larger than the last zone in the second, 1541-50 kilometers, however great the length of the journey. The standard rates per kilometer for the first division were as follows:

| | Class I | Class II | Class III |
|---|---|---|---|
| Express trains | 12.76 centimes | 8.93 centimes | 5.80 centimes |
| Slow and mixed trains | 11.60 centimes | 8.12 centimes | 5.22 centimes |

Italian freight service is divided into two broad general classes or groups: (1) fast freight and (2) slow freight. These have been divided into two and eight classes respectively. Furthermore, a distinction has been made between "conveyance charges" and "terminal charges" in Italy. Thus for slow freight "the terminals were in 1907 fixed at 206 lire per ton for the first five classes and 123 lire for the last three. The normal conveyance rates were at this date for the eight classes as follows: 16.48 centimes per net (metric) ton per kilometer, 14.42, 12.36, 10.30, 8.24, 7.21, 6.18, 5.15,"

Average length of trips for passengers for all classes in Italy is very short being only 3 miles - 1900. The traffic is composed of small shipments which has given rise to the "Expediture" or shipping agent. The hauls are very short. There has developed certain rates based on minimum shipments or based on extraordinary(1) requirements as to loading and unloading. "The wagon-load rates have been general for the large majority

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(1). The Railway Situation in Italy, Filippo Tajain, Q. J. Econ. vol. 32, p. 618

of Italian traffic; and for these the zone system has applied to both distance and weight; for special slow service, only to distance. Certain concessions have been made to discourage certain imports and encourage certain exports.

German passenger traffic is divided into four classes or five including the socalled "military" class. Almost nine tenths of the traffic is included in the third and fourth groups or classes, the two classes combined amounting to 69.6% of the total in 1860, 75.8% in 1875, 87.9% in 1891-92, and 88.6% in 1905. Trips are short in Germany and the value of trips per capita is small. The general tendency has been for railroads to standardize railroad passenger rates on a per passenger per kilometer. basis. After a long struggle the reform of 1907 brought about uniformity in rates dividing the new standard into express and ordinary rates. It should be bourne in mind that German and European passinger service in general does not provide for baggage as in America.

In the case of freight rates in 1877 there was worked out by representatives of all of the railways a uniform classification and rates. It recognized and created two general groups: (1) express and (2) slow service basing the rate on distance basis of charge per ton per mile. Again, German railways make a distinction between "conveyance charges" and "terminal charges". However, at present in actual practice considerably more than half of the freight traffic is carried at exceptional rates. In Prussia 59.1% of all the traffic in 1882, 61.3% in 1885, 46.8% in 1890, 45.6% in 1895, 64.2% in 1900, 64.3% in1906, moved

on special rates. "In 1910 there were 27 exceptional commodities and 31 special seaport classes." These, of course, included the raw material like ores, wood, coal and oil. This raw material class includes or removes at a special rate of 2.2 pf. per ton per kilometer for distances up to 350 kilometers, and 1.4 for longer hauls. Its terminal charges are 70 pf. per ton.(1)

A failure to follow policy of the theory of distance rates or to adjust them is the result of a desire to foster German commerce by offering exceptional rates to raw materials coming in and from the sources, and to exported finished products. Again, the keen competition of Belgian, French, and Dutch carriers brought the exceptional rates.

The rigid distance rate seems to be very simple but has not proven very efficient in Germany. Still when the socalled exceptions were introduced the system of rates was greatly complicated until in 1912 it would require 915 volumes to contain the complete set of all tariffs of all railroads in the Empire. In 1908 for goods alone there were 798 tariffs - 209 for domestic commodities, 392 for goods hauled between Germany and foreign lands, 107 for foreign commodities carried through Germany; for live stock, 120, and for coal, 87. Carload lots move at less than smaller quantities. The multiplicity of tariffs and the complesity of rates has brought into existence in Germany the "expediteur" already observed in Italy and France as serving as a middle man or shipping agent.

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(1). Control of Railroad Accounts in Leading European Countries, A. M. Sakolski, Q. J. Econ. vol. 27, p. 472.

The strict rate distance has forced Berlin to bring her fresh foods from a small area as compared with New York. Again it has encouraged the use of foreign coal in Northern Germany when domestic mines abound in Southern Germany. Perhaps the tapering rate would greatly alleviate the high distance rate and bring many parts of Germany claser together is the comment of Professor Raper.

In conclusion it may be added that German freight service is not so good as its passenger service which doubtless enjoys some of its economy and efficiency at the expense of the freight service. Attention whould also be called to the part of canals in the German system of freight transportation.

## THE POSSIBILITY OF THE ALLOCATION OF COSTS.

During recent years the various states, local and federal govermental bodies have taken steps to regulate rates for service performed by the various public utilities, comprising railroads, both steam and electric, telephone systems, electric supply systems, gas works, and practically all other varieties of public utilities. "The Interstate Commerce Commission as treated in the previous section is a federal body which has jurisdiction over the subject of interstate rates and service, i.e., where the pro;erty and service of the utility extend across the boundaries of one state into another-----" "The first question which naturally arises is: Why are utilities which belong to the highest order of industries necessary to human comfort, and in which the investment is usually very great, subjected to regulation, while other industries, some of which are even more necessary to human existance than the public utilities are not regulated? Why limit a streetcar fare to five cents and allow the butcher to charge twice this sum in excess of a normal profit on a single pound of his merchandise? The former is not a vital necessity while the latter is".

"The answer (to this question) lies in the fact that all governments whether local or federal have granted unusual privileges to public utilities, and thereby place the utilities under an obligation to take no more from the public which is the

giveer of these privileges, than would represent a fair return on the value of the property". This latter statement is the very crux of the question under consideration, namely the determination of a fair return with cost a s the basis. Among the privileges granted to public utilities are: (a) the right of condemnation or eminent domain; (b) the right to use public streets and highways; (c) and the granting of privileges which place the utilities beyond competition and make it a monopoly. In the discussion of the theoretical side of the question the tendency of railroads toward monopoly has been discovered. Such a grant as this latter would alone warrant government control. Yet in the face of such favors the utility is left to work out its own destiny in the particular locality where it is located. "The value of a street railway plant resides mainly in two facts: (1) it is an operating business which has cost a certain amount of money to install and develop, (2) and it has become a regular part of the life of the community." It is a case of vast fixed capital and when it falls into ill favor or has other misfortune it cannot simply move to another location as in the case of the butcher.

"From all of which it is obvious: (1) that a public utility is subject to regulation, bpth as to character of service and as to the rates charged therefor; and(2) that the rates so fixed must be sufficient to pay all the reasonable costs of performing the service stipulated and also to pay a fair return on the investment." In answering the question of the expediency of granting a monopoly to one company rather than all8wother companies to compete and thus determine a competition rate I wish to again refer to the disastrous rate war of the seventies

and again state that history has proved the expediency of competition rates in steam railways. Furthermore it would cost the public less actual capital since it would eliminate needless duplication of equipment. It is obvious such mono

It is obvious that such monopolies should not be granted, with the attendant privileges, unless it is for the welfare of the community. If the given utility is a vital necessity to the public and justly warrents the appellation, "public utility," even though it cannot be reasonably expected to pay an inducive or even a return to cover costs, it may be expedient for the g government to subsidize such an industry. This seems more expedient and equitable than simply permitting the industry to charge a rate which will place the entire burden on a few who actually use the utility while the many who benefit incidentally, by the increased value of property, and the increased general prosperity, go free from the burden. It may be argued that such a proposition is based on a confused sonception of the incidence of such a burden, that it is only too obvious that laborers and merchants and the artificers will raise the prico of their products by the amount of the enhanced rate they must pay, thus passing the burden on and diffusing it amoung the whole people. However, all students of economics now recognize the fallacious n nature of this "diffusion" argument whether it be in the question of taxation, where it was stated by its advocates that it made no difference where tax was placed fori in the end it would diffuse among the whole poeple, or whether it be in this question of rate making for public utilities.

# THE POSSIBILITY OF ALLOCATION OF COSTS

This leads to the fact that whether the railway or public utility is sufficiently productive to pay the cost by means of an income actually earned by rate charge to those actually benefited or whether any such cost must be defrayed by government subsidy, it must be forthcoming and furthermore, in either case the burden is upon the public.(1) It is not the object of this paper to discass the most expedient manner of distributing this burden yet is to be noted that this is a vital question growing more acute daily.

This is a society of private property holding. A man has the privilege of choice of occupation and the holders of capital possess the choice of investment. In a previous portion of this paper the differential nature of economic rent has been discussed briefly. Notably is economic rent a differential item but it is held by the more modern writers that the rate of interest on all capital is of the same nature and determined by the marginal productivity of capital. It is only too obvious that the basis for this is that all capital investments are not equally productive. In a society of private property holding it is the privilege of the holder of capital to choose the investment into which he will invest his capital. Since thee days of Adam Smith the determinant has been recognized to be self interest. If then it is the marginal capital which determines the rate, and the marginal capital is the capital which barely returns the principal but no interest, and, should railroads be below the margin, it is

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(1). F. W. Taussig. "A Contribution to the Theory of Rates." Quart. Jour. of Econ., vol V, p. 443.

only too obvious that investers will not invest therein. It seems then that cost must be a determinant of rates if private ownership of railroads is to continue, and even though the government saw fit to own and operate, or to operate them, cost must not go unconsidered. It is argued that the investor should receive a fair return on his capital. How then is such a fair return to be determined unless first we know the cost? How is justice to be shown to all those benefited unless the service they receive bears a just relation to the cost? It is not the intention here to hold that value can be interpreted entirely objectively, however, but to point out that to ignore cost is to seek to find the unknown in terms of two other unknowns.

> Ther general theory on which a fair income from the ownership and operation of a public service corporation is based, is that the money, legitimately and properly invested by those undertaking the enterprise, shall bring a reasonable return from the moment of its investment; that this reasonable return shall continue so long as the invester's funds remain in the property; that the investment shall be maintained constantly at its original value except when withdrawn by the investor; that all subsequent funds invested in additions to or increases in plant shall be protected in the same manner as the original investment; and finally, that a "reasonable" return on this class of investment shall be greater than a "reasonable" return on bonds or other guaranteed securities of the character issued by stable governments or prosperous municipalities.

The statement quoted above would duely care for all items, warrenting a sufficiently high rate to cover depreciation, and risk and sees no reason for condemning a reasonable surplus since all years are not lean and all are not fat, but the investor will be guaranteed a fair return in order that the use of his capital may be retained.

The same author quoted above declares that in order to make a plant pay from the beginning, "the valuation(1) of the plant made at any time must be the total ariginal cost together with certain cadditions and subtractions: the additions are: (a) Losses of allowable income sustained during unproductive years. (b) Additions to plant. (c) Cost of replacement of wornout or retired equipment. (d) Depreciation funds set aside. The subtractions are: (a) Profits in excess of normal allowable income. (b) Apparatus, buildings, distribution system, track and all portions of the plant which has been destroyed, removed or taken permanently out of service for any reason. (c) Depreciation in plant values".

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(1). Sakolski, A. N., Problems of Railroad Valuation, Economic Review, vol. 8 (1915)

Samuel Dunn, Valuation of Railroads with especial reference to Physical Valuation in Minesota, Journal of Political Economy, vol. 17. (1909).

A A. Berglund, Valuation of Railroads in the State of Washington, Jour. of Polit. Econ. vol. 21. (1913)

J. S. Adams, A Valuation of Railroads for Purposes of Taxation. Jour. of Polit. Econ. vol. 23. (1915)

Edward L. Swart, Railroad Valuation as a Tool, Jour. of Polit. Econ. vol. 28, (1920). This author estimates that a fair return (5 1/2%) should be yielded on investment.

Pierce Butler, Valuation of Railway Property of Purposes of rate regulation. Jour. os Polit. Econ. vol. 23 (1918)

W. Z. Ripley, The Investor in Railroad Valuation, Jour. of Polit. Econ.

Certainly the consideration of the above items must be included in the fixing of a rate but unless the utility has a distinct and peculiar benefit to confer on the community the fact that funds are invested are to claim to a return, but if the people recognize that such a utility is worthy of privileges and desirable such a guarantee of return must be forthcoming to retain the investment.

Rate making is not a simple arithmetic process but is a compoex and difficult science and even an art. Even expert engineers disagree on such items as (a) the value of the property, including equipment and intangible charges; (b) the amount of the depreciation-- both accrued and to be allowed for the future; (c) the reasonableness of certain charges set up in the cost of operation; (d) and the amount of losses sustained in the initial stages of operation of the utility, if any: i.e. the socalled "Cost of Establishing Business" or "Going Value". If the mere settlement of these matters was all the determination of the rate would be easy, but not all services are equally valuable nor entirely similar. Rates must vary with the commodities in question for not all freight traffic can bear an equal rate nor does all freight traffic cost the same to transport it, nor does the current used in a motor bear the same rate charges as that used for illumination. It is evident then that local conditions cannot be ignored since the utility and the community are mutually interdependant.

One factor which greatly complicates rate making is the necessity of predicting the condition of the utility and the population which it will serne for some years in advance. It is not practical to make a new rate based on cost for every article transported. In order to assist and encourage business, the rate charged must not only be favorable in amount but stable. Rate wars tended to produce low rates but most unstable and uncertain rates which tended to demoralize and even paraoize certain business because of this uncertainty. For the same reason that business may depend upon a decision of a court as establishing a stable opinion on the particular question so must rates be stable for at least a period of time.

Thus in most cases where rates are fixed by regulatory bodies, they are fixed for five, three or a shorter period. "In order to determine the rates therefore, it is necessary to decide on some uniform rate which will yield a return to the company during the assumed period, sufficient to meet all operating charges plus the allowable net profit on the average investment." It is necessary in making this prediction to determine, (a) the growth of population; which may reasonably be expected; (b) the increase in the amount of service which will be required per unit of population; (c) the increase in the equipment which will be required by the utility to render the service which will be demanded of it; (d) and the cost, per unit of service, for all operating expenses, averaging over the period over which the rate is to apply[1]

In determining the probable increase in population it will be necessary to study the growth during prior years and by getting an average for a reasonable period, extend this prediction by growth cerves, carefully modified by curves plotted from similar communities. In the record item mentioned above the service demanded per unit of population must depend upon investigations of like utilities in other countries of similar circumstances and in other similar nearby localities. This leads to the conclusion of the probable "load" demanded which is determined by multiplying (a) by (b) in the above statement. Lastly comes the actual problem of allocating costs to the various branches of service, and then to the various commodities transported.

"The rate of return for a public utility may be fixed in accordance with one of three conditions, which are; (a) that it be just high enough to avoid confiscation, (b) that it give a reasonable return, (c) that it be higher than either (a) or (b) and dictated by expediency. Of course the rate of any utility in different communities would very greatly. Thus the rate which escapes confiscation has been variously fixed by differentt courts. One of the earliest and most celebrated cases was that of the Knoxville Water Company in which the court decided that a 4% return, with an additional 2% allowance for depreciation, was not confiscatory, therefore the Knoxville Water Company could obtain no relief in the courts and its petition for a higher rate was denied.

More recent decisions place the rate at 6% plus a reasonable depreciation allowance.

It seems that due to the fact railroads are duly protected by monopoly rights that investments therein are as safe as those in any form of enterprise or securities, with the possible exception of city, state or United States government bonds. Furthermore, these public utilities have always had recourse to the courts for any real losses. For these reasons it seems that the proper rate of return on money invested in any form of enterprise pertaking of the nature of a public utility, should be only a reasonable interest rate, plus the amount necessary for paying the owners a small percentage, and should carry with it no speculative returns, sudh as might rationally be applied to other forms of investment in which the funds are less secure. An expedient rate of return may be a fixed rate, say 8%, on property value. This must take into account the rate at which the utilities must secure funds with which to operate. In the gas company public utility several unique schemes fo the slicing rule type have been devised which would share the lessened cost advantages due to increased production with both consumer and producer. Among the schemes are the socalled "London Sliding Scale" and "Houston Bonus System". These are not entirely different form the socalled "Plumb Plan" of operating the railroads.

In the making of tramway fares the question is not extremely difficult of solution. Most of the European tramway

systems are divided into zones, and the fare is based on a unit charge for passing through such zones, or what is the same thing the passenger pays an amount proportional to distance over which he is carried. This is entirely different from the American plan of charging the same fare for a long haul as a short haul. This is true of the European railway systems as previously noted. Such seems contrary to American public policy since European cities are already as thickly populated and the adjacent country as thickly built up as they can ever be while the American policy is to have the suburbs populated.

Theoretical rates for street cars are the easiest of all rates to determine, but such theoretical figures are necessarily subject to modification, in order to be adopted to the locality and within some reasonable subdivision of our unit currency. As an example of this, using the same author's figures, consider a street railway having an original value of $4,887,500 the real estate $181,000, and all the other values $583,200.

"The accrued depreciation, net, is $862,000. The net value of the property then is $5,651,700 - $862,000 - $4,789,100.

| | |
|---|---|
| Annual operating expenses, total including taxes.. | $1,520,720 |
| Depreciation, 3% on $4,887,500 . . . . . . . . . . . | 146,625 |
| Net return, 8% on $4,789,100 . . . . . . . . . . . . | 383,128 |
| Total gross income necessary . . . . . . . . . . . . | $2,050,473 |

The railway has certain sources of income outside that proceeds from passinger traffic, suchas rental of advertising privileges in cars, power sales and possibly others. The income from all these sources is $40,000 per annum. Deducting this from the gross required income, there remains $2?010, 000 ahich must be secured from passenger traffic.

"The approximate number of passingers for the year is estimated at 34,532,000. Hence the theoretical fare would be: $\frac{2,010,473}{34,532,000}$ - $0.05822 or 5.822 cents.

It will then be necessary to work out the fare most practical. If the above fare were six cents then the return would be more than 3% too high. Therefore it seems best to charge seven cents for cash fares and five cents for tickets, etc.

The fundamental principles thus laid down are sufficient introduction to a discussion of costs and possibilities of their allocation in the railroad industry. The first step in rate making is classification(1). The first step in classification comes in the division of passenger and freight services. This is of course a very simple matter. Then follows that grouping of commodities in classes accordingly as;

> (the) commodities are crude, rough, or finished; liquid or dry; knocked down or set up; loose or in bulk; nested or in boxes, or otherwise packed; if vegetables, whether green or dry, desiccated or evaporated; the market value and shippers' representations as to their character; the cost of service, length and direction of haul; the season and manner of shipment; the space occupied and weight; whether in carload or less than carload lots; the volume of annual shipments to be caldulated on; the sort of car

> required, whether flat, gondola, box, tank, or special; whether ice or heat must be furnished; the speed of trains necessary for perishable of otherwise rush goods; the risk of handling, either to the goods themselves or other property, the weights, actual and estimated; the carrier's risk or owner's release from damage or loss. All these circumstances, bewildering as they appear to the layman, are comparatively simple to the expert.

When such a grouping of commodities has been effected the next step is the actual determination of charges for each group of commodities. The problem of separating passenger and freight costs has taken no inconsiderable amount of the attention of accountants.

In the instructions laid down by the Commission as to the apportionment of costs between passenger and freight service there are three general principles followed. Such expenditures as may be definitely and accurately allocated should be reported separately. Such expenditures as may not be definitely and a accurately allocated, but are susceptible of apportionment on some basis which will approximately represent the facts, should be pro-rated. Such expenditures as those which defy any accurate or even approximate allocation or apportionment should be reported as "undivided, the Commission to later determine or as needed in special cases, how the undivided items should be split between the two classes of service.

Examples of the first group of direct charges include wages of locomotive and train crews, and cost of locomotive fuel. The second group includes such accounts as station service where a part may be directly allocated and the remainder must be apportioned on the basis of "man hours" and "locomotive hours".

The third group of items include such items as these found in the maintinance of way and structures accounts. Among these would be the renewal of ties , rails, ballast, and all items classed as general expenses.

Maintenance of way items present the greatest problems. All charges not apportioned directly or directly allocated are to be apportioned on various bases. Thus all of the items of superintendence is to be reported as undivided, while maintenance of fuel stations is divided on the basis of freight and passenger fuel costs.

Only one item under maintenance of equipment defies allocation or apportionment, viz, work equipment-repairs and depreciation and retirements. Depreciation and retirement of locomotives and cars are to be assigned directly a far as possible "and apportion the remainder according to themileage made in each class of traffic, by individual locomotives (or cars)." Maintenance of way superintendence is to be apportioned on the same basis as freight and passenger proportions of repairs of locomotives and cars. The entire group of traffic expenses is to be assigned directly. Transportation expenses are all to be assigned and none to be reported undivided. Thus train dispatching is to be apportioned according to transportation miles.

In various hearings the trend of opinion has favored the bases of separation in general , but the separation of maintenance of way expenditures has raised a storm of crirism and varied opinions. (1) Three groups of factors affect this group

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(1) Separation of Railway Costs between Freight and Passenger, J.H. Parmelee, Q. J. Of Econ. p.352, Vol. 34.

namely, natural deterioration caused by the elements; wear and tear caused by locomotive and car use; and standard of maintenance. As to the varied opinions, it was estimated in the Buell case that 25 per cent. of repairs ansd renewals were due to the effect of the elements, while Woodlock estimates that 90 per cent. of the maintenance of way repairs is due to natural deterioration. No great value comes this division at best and the Interstate Commerce Commission Classification completely ignores this feature.

The wear and tear of roadbed, track, structure and trestles, as well as culverts etc, is due to the action of locomotive and car wheels. This item is affected by the design of the locomotive and cars as regards to length of rigid structure, counterbalances in driving wheels, quality of springs and riding characteristics of trucks. Again, the length and weight of trainsenterinto the question.

> At present (1917) theaverage freight train consists of approximately thirty- six cars, loads and empties which will weigh approximately 1200 tons. The average passenger train has about six cars which weigh approximately 380 tons. ( This average is for all passenger trains- through , suburban, and branch lines) A modern express train, consisting of eight steel cars weighs about 550 tons) . The weight of the average freigh train , therefore, is more than three times the weight of the average passenger train, and the former has about six times the number of cars. (1)

The relative speed of passenger and freight trains is another factor in the apportionment of costs between passenger and freight service. Studies of engineers on this subject as bearing on the apportionment of costs were brought out by Mr. George R. Martin <u>in the Buell case, while</u> at the same time

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(1) Separation of Railroad Operating Expenses Between Freight And Passenger s, W.J.Cunningham, Q, J. of Econ. Vol. 31.

Professor W.D.Prince of the University of Wisconsin presented his study. In 1915 the American Railway Engineering Association presented an elaborate report suggesting the "weighting" of locomotives and cars in the two classes of service according to their relative destructiveness stated in terms of ratios, which were:

> Ton-miles in freight service should be considered as 100.
> Ton-miles in passenger service should be considered as 200.
> Locomotive-miles in passenger service should be considered as 400.
> Locomotive-miles in freight service should be considered as 200.

This report was not officially approved by that body. (1) For the use of these units in actual practice the best examples are the New England Milk case and the Western Passenger Rate case. (2)

The next question to be treated is the relative fixed and variable charges among railroad expenditures. Professor Ripley has probably the best treatise on this phase of the subject and his work shall be the guide in this discussion. In 1910 the total railroad expenditures amounted to $1,822,000,000 of which $490,000,000 were for taxes and interest on debt. This amount was 27 per cent of the total expenditures. The figure is a very constant item. Tt reached its highest point in 1895 when it amounted to 33.07 per cent of the total expenditures. It has been observed by Professor Ripley that most of the items are fairly constant from year to year. The table on the following page shows the distribution of such charges in the year 1909.

(1) As to the relative merits of these units see Separation of Railroad Expenses Between Freight and Passengers, W.J.Cunningham, Q.J.Econ. Vol. 31.
(2) 40 I.C.C. 699.

| Name of Group | Per cent of operating expenses. | | Per cent of total Expenses. |
|---|---|---|---|
| Maintenance of Ways Etc. | | 19.78 | 14.39 |
| Repairs of Roadway | 10.39 | | |
| Renewals of ties | 2.66 | | |
| Renewals of rails | 1.3 | | |
| Repairs etc to bridges | 2.32 | | |
| Repairs etc to buildings | 2.11 | | |
| Maintenance of Equipment: | | 20.76 | 15.09 |
| Repairs and renewals of locomotives............. | 8.29 | | |
| Repairs to pass. cars | 1.97 | | |
| Repairs to freight cars | 8.20 | | |
| Conducting Transportation: | | 55.49 | 40.36 |
| Engine & roundhouse men | 9.40 | | |
| Fuel for locomotives | 11.98 | | |
| Trains service ( wages) | 6.54 | | |
| Switchmen & flagmen | 4.34 | | |
| Station service | 6.44 | | |
| General Expenses : | | 3.94 | 2.90 |
| Total Operating Expenses | | 100.00 | 27.23 |
| Fixed Charges | | | |
| Total | | | 100.00 (1) |

The above table is self explanatory, yet it will be further analyzed on the following page. From the table on that page ,

> --one arives at the general conclusion that approximately two-thirds of the total expenditures af a railroad and more than one-half of the total operating expenses are independent of the volume of traffic. The remaining half of all of the expenditures,or what amounts to the same thing, the other half of the operating expenses, are immediately responsive to any variation in the business. Applied to the railroad net of the United States, this means that only about one- third of the $ 2,000,000n disbursed in 1905, an amount equal at that time to two and a halfq times the national debt was susceptible to variations according to or as traffic expanded or decreased.

(1) Ripley, Rates and Regulation, p.55; also see U.S. Railroad Statistics, for 1909.

Thesee estimates agree with those of other authorities. The vice-president of the Southern Pacific in 1892 after a considerable investigation agreed that the above statistics were about the same as those he had arrived at. Sax, the German authority, says that one-half of a road's outlay is constant ans that htis operating outgo equals about one half of the total expenditures, the other half being capital cost and consequently, constant. This means that about three-fourths of the total figure is constant. Eaton, the English authority estimates that one-half of the total expenditures are constant.

| | Per cent. Oper. Expen. | | | Per cent. Total Expen. | | |
|---|---|---|---|---|---|---|
| | Both | Constant | Variable | Both | Constant | Variable |
| Main. of Way | 20 | 13.4 | 6.6 | 15 | 10 | 5 |
| Main. of Equip. | 20 | 10.0 | 10.0 | 15 | 7.5 | 7.5 |
| Cond. of Trans. | 56 | 28.0 | 28.0 | 40. | 20. | 20. |
| General | 4 | 4.0 | --- | 3. | 3. | --- |
| | 100.0 | 55.4 | 44.6 | | | |
| Fixed Charges | | | | 27.0 | 27.0 | ---- |
| Total | | | | 100.0 | 67.5 | 32.5 |

For an instance of detailed analysis of cost the general investigation of soft coal rates to the lakes in in 1912 is highly suggestive. Two-thirds of the revenue went for the operation and the maintenance, one-third for return upon the plant. This was the first attempt to justify an advance in rates for a large volume of traffic on the ground that it did not contribut its share of or its proportion of earnings. (1)

Professor Ripley then sums up the analysis of costs in

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(1) 22 I.C.C. Rep. 604; and also Ripley, Rates and Regulation, pp. 59-65.

the following words:

> Until such an analysis is made, it will suffice for our purpose(to say) viz, the analysis for the purpose of rate making, that we adhere to our first principle, or general conclusion, namely that of the total expenditures of a railroad, at any given time, about two-thirds of them are constant, while one-third varies with the ups and the downs of the volume of traffic. Comprehending in survey a long period of years, it might happen as Acworth concludes, that nearly one half of the total expenditures were entirely fixed in character leaving the other half as dependent upon the amount of transportation affected. (1)

Ripley further points out the unsuccessful attempt of the Commission to separate even passenger and freight expenditures before and up to 1894. So unsuccesful was this that it was abandoned in that yearalthough some roads like the Louisville and Nashville and the Burlingtonstill divided their expenses on their own initiative. Usually those roads doing this used the engine mile as the basis. (2) The same author sees no value of doing this in this approximate manner except for the comparison of different years on the same road.

> The most absurd conclusions may result. Thus at one time it appeared from such data compiled by the Interstate Commerce Commission, that the New York Central, with five times the density of traffic of the Illinois Central, was actually conducting the freight business at a much higher cost per ton-mile. Such inconsistencies induced the Interstate Commerce Commission in 1894 to abandon the attempt at any such primary separation of accounts ( As previously cited the first serious attempt was the Soft Coal Rates Case to the lakes )

In a number of cases and with varying criteria costs had been used before the writing ogf Ripley. These are treated at some length in the section dealing with the decisions of the Commission. Ana outstanding example of a decision based on cost is the socalled Two-Cent Fare decision of the Wisconsin Commissin in 1907.

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(1) Ripley, Rates and Regulation, p. 65. Also see Railroad Operating Costs, by Sufferer & Co. N.Y. 1911; and Yale Review, 1910, as torate advances that year.

(2) Ripley, Ibid, p.65.

Ripley estimates that probably over noe-half of the expenditures for freight and passenger services are entirely joint, however distinct the revenues from each. We have seen that approximately two-thirds of the outgo is incurred on behalf of the property as a whole. Certain expenses are to be sure, (such as train wages, coal consumption, and maintenance of rolling stock) readily divisible, but with respect to maintenance of way and structures--about 40 per cent of the total outgo-- all guides fail. Then, how about the large item of capital charges? This equals about 27 per cent of the total expendituresfor the entire railroad net in the United States. It may be suggested that the item be apportioned on the basis of the relative gross or net revenue from the passenger and freight business respectively. Here Ripley thinks that it would be absurd to attempt to apportion such an expense as a million dollars for the abolition of grade crossings in this way. This would especially be true when several roads are compared. Thus we would find this the case on such roads as the New Haven with freight and passenger revenues about equal, as compared with a Western road with only one tenth of its income derived from passengers. The apparent cost of the freight business on the Eastern road would be absurdly reduced by any such process.

This being so, how futile it is to expect to be able to set off the expenses due to any particular portion either of the freight or passenger service, and especially to any individual shipment. It may oftimes be possible to determine the extra cost due to the individual shipments. This of course , applies to what are called movemant costsor expenses. Thus the haulage

> costs of a 2000 ton grain train from Chicago to New York has been estimated at $ 526. But how small a part of this is of the total cost, the preceding analysis must have made clear. In the Texas Cattle Case, detailed analysis of the extra cost for the cattle was presented.(1) The starting point was necessarily an allocation of freight and passenger expenditures, which if defective, would vitiate the entire subsequent calculation as to costs. In this instance it was the judgment of the Interstate Commerce Commission in its final decision in 1908, that no such separation of expenditures was possible as a basis for the determination of costs of service. (2)

Having discussed the general trend od cost accounting in regards to classification, the relative fixed and variable charges we will now turn to the separation of costs between freight and passenger service, and a brief treatment of the units of such a separation and the possibilities of allocation and apportionment of expenses to a greater extent for rate making purposes. A tentative scheme for the separation of expenses between passenger and freight was drawn up in March, 1915 (S.S.C. No.4), based on formulae suggested by the representatives of the railways. The bases for the separation of maintenance of ways and structures expenses is still under fire of criticism. At the time of the meeting of these committees in 1915, for the discussion of the separation of maintenance of ways and structures, the following units were discussed:

1. Thel ocomotive ton-mile.
2. The locomotive tractive power-mile.
3. The direct charges.
4. The gross ton-mile.

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(1) 13 I.C.C. Rep. 423. Compare Idem, 423, and the Yale Review for 1908,p287. (2) Seee Ripley, W.Z., Rates and Regulation, p65. Also see A Contribution to the Theory of Rates, F.W.Taussig, Q.J.Econ. Vol. V.

Two of these units were outstandingly favored. The state commissions favored gross ton-miles and the railways favoredlocomotives ton-miles. Being unables to decidebetween the two the Commission provided reports covering both.

According to Professor Cunningham, twelve bases of apportionment have been used or suggested from time to time, and Dr. Parmelee notes that this is by no means exhaustive.(1)

1. Train miles.
2. Train miles plus switching Locomotive miles.
3. Gross tom-miles.
4. Road locomotive miles.
5. Road and swithching locomotive miles.
6. Locomotive ton-miles.
7. Car miles.
8. Train miles plus car miles.
9. Weighted gross ton-miles.
10. Direct expenses.
11. Operating revenues.
12. Tons of fuel consumed by locomotives. (2)

The units in the Wisconsin Express Case were ton-miles, gross earnings, revenue train miles, and locomotive train miles.(3 It is well to note Olmsted's objection to the term allocation being used interchangeably with the term apportionment. He says,

> Allocation( that is, of direct charges) is the assignment of facts; apportionment is the determination of policy. The former concerns itself with what is ; the letter with what ought to be.... Allocation aims to find what each service costs; apportinnaims to determine what each service ought ot pay.

Dr. Parmelee suggests that any unit of apportionment would be open to criticism and perhaps apportionment, especially on the basis of other costs rather than on th physical service units "smacks of the effort to raise oneself by the bootstraps."

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(1) Separation of Railway Costs Between Freight and Passengers, J.H.Parmelee, Q.J.Econ. Vol.34, p.358.
(2) Slason Thompson, Railway Library, 1909, p.185.
(3) An Application of Cost Accounting to Ratemaking, R.H.Tucker, Jour. of Polit. Econ. Vol. 23. p. 585-98.
(1 b) Separation of Railroad Operating Expenses between Freight and Passengers, W.J.Cunningham, Q.J.Econ. Vol. 31.

In broad sweeping terms we have covered the question of classification and the separation of passenger and freight expenses. The next question to be touched upon briefly is the allocation and apportionment of costs to the particular services rendered. American railways now report their traffic for statistical purposes, in five large groups. Thus the Norfolk and Western Railroad reported the following traffic in the years noted:(1)

| Articles | 1921 | 1920 | 1919 | 1918 | 1917 |
|---|---|---|---|---|---|
| Prod. of Agri. | 3.92 | 3.54 | 4.39 | 3.78 | 3.42 |
| Prod. of For. | 4.86 | 5.57 | 5.93 | 5.36 | 6.65 |
| Prod. of Anim. | 0.59 | 0.49 | 0.70 | 0.65 | 0.52 |
| Prod. of Mines | 79.33 | 75.81 | 75 .57 | 74.02 | 74.10 |
| M'f'g & Misc. | 8.97 | 12.45 | 11.96 | 15.15 | 14.50 |
| Mdse & Other Misc | 2.33 | 2.14 | 1.31 | 1.04 | 0.79 |
| Totals | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

The problem is to select some or several of the units discussed or to originate new units and apportion such expenses as are not directly allocable to some special service or product. Some authors are still optimistic and believe that even yet the time will come when cost accounting will have reached such a refined stage that costs may be allocated or apportioned with sufficient accuracy to base rates thereon. It has been the attempt of this paper to review the literature on the subject and set forth the general trend of opinion concerning the problem, of application of cost to ratemaking.

As yet no adequate system of cost accounting has appeared to offer solution to the problem. Indeed the cost of maintaining a railway accounting system sufficiently detailed to be exact and useful in ratemaking would involve an expense which would almost be prohibitory. (1) The words of Dr. Parmelee summarize the present situation excellently:

> In brief, and finally, it appears that for railroad ratemaking purposes, whether freight of passenger rates, no scheme of cost separation yet developed can be helpful except in the most general way. The classification will add considerably to the sum of information possessed by students of railway affairs, and may well assist the railways themselves in furnishings tandards by which to adjudge the efficiency of operation. It will unquestionably give the Commission valuable data along the same line. It will Develope material for further discussion of the cost of the service, value of the service, and other factors in the philosophy of rate construction. For all these purpoles it will be useful , but for purposes of detailed ratemaking, I feel that the complicated factors entering into the problem prevent this particular phase of cost accounting attaining great utility. (2)

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(1) Separation of Costs between Freight and Passsengess, J.H.Parmelee, Q.J. of Econ. Vol. 34.
30 I.C.C. 680-81.
Opinion of District Judge F. A. Youmans in his opinion in the Oklahoma Rate Case, March 12, 1918, p. 9.
(2) See Bureau of Economics Bibliography of References on Railroad cost accounting.

## SUMMARY

To summarize , it seems that htere are decidedly two sides toe the issue. (1)In favor of the cost basis of rates stands the economic principle that under conditions of free and uninterrupted competition cost plus a fair rate of return on the investment will be the ultimate basis. (2) Cost is by far the most exact and scientific basis for the determination of rates. The increasing stress of the Interstate Commerce Commission and the state commissions, and Federal Courts on the cost of service in the determination of just rates in their decisions seem to necessitate a separation of costs for the purpose of rate making. Such decisions as the Wisconsin Express Rate Case, the New England Milk Case, and the Buelle case previously cited in this paper are examples of such decisions as are the Scores of cases cited and reviewed in the section of this paper devoted to the theories of the Interstate Commerce Commission. A separation of costs between the freight and passenger services was the basis of the decision in the Western Passenger Rate Case. (4) Costs as a basis for rate determination would prevent the gross discrimination that tends to exist between commodities and localities. Rather than discriminate against one commodity in favor of another it would be better to operate with a deficit and make up the this from general taxation, since the railroad is a public utility and is " affected with a public interest ". (5) If recent laws concerning rates on the basis of a fair rate of

the capital investment are to be effective an analysis of cost and expenditures in general must be eventually made. In the words of Professor Robert T. Tucker of Washington and Lee University, " Laying aside the question of 'added trffic' I still think it ought be possible to devise methods for making a reasonably accurate separation of railway expenditures. Certainly the decisions of the Supreme Court and the Interstate Commerce Commisssion in recent years would seem to make such a separation necessary."

On the other hand there are certain obstacles in the way of using cost as basis in rate determination seem almost insurmountable. (1) Thus it is generally agreed that to this time there has been offered no accounting system which is able to give the desired accurate data. If there were and where such cost analysis has been attempted the cost of securing the data has been almost prohibitory, and we have no reason to hope for a cheaper system. If a strict cost basis were adhered to many bulky commodities of low value would be transported and the policy of socialization of fares and rates could not be affected. (3) Sakolski declares that to use cost as a basis for rate making would be attempting to find one unknown in the terms of another. This has been discussed in another part of this paper. (4) In the world of prices at large cost is not the determinant of prices then why do we wish to make the railroad an exception? In answer to this point it will be recalled that the point has been treated in light of the peculiar nature of the railroad in its relation to the public. Since the time of the Canonists

economists have not adhered to a strict cost basis except in so far as to hold that under conditions of free and simple competion cost plus a fair rate of return would be the ultimate basis of price. (5) Lastly, a cost basis would tend to wol- such extravagances as the socalled "cost plus" contracts which were let by the United States government during the recent war.

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