CHAPTER III

HYPOTHESES

As we have seen, Marshall's approach was essentially organic and evolutionary, and in the case of economics it took the form of an emphasis on the historical data. His was perhaps the only major attempt on the part of English speaking economists to treat the data of political economy in terms of the Nineteenth Century beliefs as to the nature of the social organism.[1] Problems were always dealt with in the light of the process involved in bringing them into being. It is possible to approach process inferentially by the method which economists now call comparative statics. But Marshall explicitly rejected this procedure:

> Fragmentary statical hypotheses are used as temporary auxiliaries to dynamical—or rather biological—conceptions: *but the central idea of economics, even when its foundations alone are under discussion, must be that of living force and movement* [italics mine].[2] |74|

That part of the "foundations" which is central to the rest of the analysis is the model[3] of long run normal price; and a discussion of this model will occupy the greater part of the present chapter. As a part of the overall thesis it will be necessary to demonstrate the consistency of the normal price model with Marshall's organic preconceptions, and to consider why he felt that the prevailing organization called for the fullest measure of economic chivalry before the high hopes of mankind could be realized.

The long run normal price model has been called "central" because Marshall developed his general theory of equilibrium and his theory (or theories) of distribution

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[1] A notable exception is William Edward Hearn's *Plutology*, (Melbourne: George Robertson and Co., 1864). Mary Paley Marshall, *op. cit*., p. 20, mentions that Hearn was recommended reading at Cambridge in the '70's.

[2] *Principles*, p. xv.

[3] "Model" is a term borrowed from classical mechanics, but no methodological implications are implied by its *use* here as should be clear from the text. The term has obtained such currency in economic discussions that it is difficult to avoid its use.

with reference to it. This is made clear at the end of Bk. V, Ch. v, where he states that ". . . the remainder of the present volume is chiefly concerned with . . . the normal relations of wages, profits, prices, etc., for rather long periods."[4] The analysis up to that point, insofar as it pertains to the market problem, was preliminary and consisted largely of "fragmentary statical hypotheses." The immediate task, then, is to take the principal theoretical devices ancillary to the |75| central model, to examine their interrelationship, and to discuss the use Marshall made of them in arriving at his conclusions on the nature and course of the market.

Marshall's critics have treated him both well and poorly; they are impressed with the *vue d'ensemble* of his work and on occasion indulge in extravagant encomiums on the one who ". . . ranks so high among the greatest figures in Anglo-Saxon economics that it is still almost presumptuous to praise his accomplishment, and indeed there is little need for doing so."[5] On the other hand, many of the same critics who have praise for the system as a whole are the most critical of it in its various parts. Almost none of the theoretical devices developed by Marshall has escaped the severest criticism; nor has Marshall personally escaped the strongest censure for using such "mistaken notions." The critics have frequently assumed an air of unbelievable condescension as witness Lionel Robbins:

> For Marshall, as is notorious, would not admit the ultimate severity of the static assumptions. Either for fear of becoming unintelligible to business men and economic historians, or because of his curious predilection for biological analogies he always shirked these heroic abstractions.[6] |76|

[4] *Principles*, p. 380.

[5] George J. Stigler, *Production and Distribution Theories*, (New York: Macmillan Co., 1941), p. 61. Also cf. standard textbooks such as those of Gide and Rist, Roll, Heiman and Whitacker.

[6] Lionel Robbins, "The Representative Firm", *Economic Journal*, Vol. XXXVIII, Sept. 1928, pp. 393-4.

Stigler's position is only a little different: He argues that Marshall should have been more diligent in developing a theory of stationary economics—a task which Marshall deliberately eschewed:

> Was it expedient to attempt to achieve (as Marshall did) a high degree of realism, without first establishing the very much simpler theory of stationary economics? And was it expedient to mix inextricably historical and stationary analysis in a work which was path-breaking, especially in the latter field? The writer is convinced that both, questions should be answered in the negative.[7]

Even Keynes, and for Marshall this would have been the saddest *et tu, Brute*, could say:

> Unfortunately Marshall, in his anxiety to push economic theory on to the point where it regains contact with the real world, was a little disposed sometimes to camouflage the essentially static character of his equilibrium theory with many wise and penetrating *obiter dicta* on dynamical problems.[8]

Such examples of criticism can be proliferated. They fall into two main groups. First, there are those like Stigler and Robbins who would criticize Marshall for not having stated the theoretical formulations in the manner they have chosen. Criticism of this order is *ipse dixit*, for the final test of procedure in analytical matters is to be found not in authority but in results. Second, |77| there are critics like Keynes who all too often attempt to judge parts of Marshall's system in isolation from the other parts—a failing which can only be attributed to a lack of understanding of Marshall's organic approach to economic problems.

In general, most of the criticism of Marshall's work has been on the first level of criticism; that is, the critics have been not so much concerned with the meaning of Marshall's system as with the logical relationship of the parts, or even worse, with the problem of whether some particular part has been properly defined. This critical approach is indefensible as we tried to indicate (*supra*, pp. 13f), for the first and second levels of criticism are not operationally separable. Thus, the individual parts of the

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[7] Stigler, *op. cit.*, pp. 62-3.

[8] J. M. Keynes, *A Treatise On Money*, (London: Macmillan and Co., 1931), II, p. 406.

system should only be judged, first, in terms of their contribution to the ends of the entire analysis. It is, for example, unjustifiable to accuse Marshall of having failed properly to define the long run cost curve *unless that definition is inconsistent with some other aspect of the system or inconsistent with the preconceptions underlying that system*.

There is a second allowable criticism which can be made of the individual elements composing a system: If they are inconsistent with the "facts" as they are best known, or if the facts are distorted by being forced into the Procrustean bed of a particular theoretical formulation, then the definitions implied |78| are not allowable. That is to say, Marshall's definitions, in addition to the above stipulation, are proper *unless they distort the facts by forcing interpretations upon them which are inconsistent with the other relevant facts.*[9] Marshall was fully conscious of this responsibility and expressed it on many occasions, perhaps never so cogently as in an address delivered in Cambridge in 1896:

> It is now patent, even to those who are in a hurry, that no practical problems can be settled offhand by appeal to general doctrines; for the things of which account must be taken are so diverse, and our knowledge of many of them is so slight, that they yield no firm hold for formal proof. Much must be taken on conjecture; much must be decided by common sense rather than by reasoning on strictly logical lines.
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> Thus the growing perfection of scientific machinery in economics, so far from lessening the responsibilities of common sense, increases those responsibilities. . . .[10]

The insistence upon "common sense" must be taken in its philosophical usage. Marshall was simply saying that the logical abstractions which are by their very nature of more general application should always give way to the requirements of the data, for those logical abstractions are generally based on data which future observation will prove deficient.

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[9] Cf., Stephen C. Pepper, "The Descriptive Definition," *The Journal of Philosophy*, Vol. XLIII, No. 2, January 17, 1946.

[10] *Memorials*, p. 297; also, *ibid*., p. 164.

It has already been indicated that Marshall rejected, except for purposes of preliminary analysis, "fragmentary static hypotheses"; further, he emphasized the necessity for a closer |79| correlation between the data and the theoretical formulation. As a result of these emphases and the preconceptions underlying his systematic analysis, the world derived *a priori* from Marshall's theoretical statement is strikingly different from the world derived from the theoretical statements of his successors.[11] To begin, his was a world of continual change and flux. Firms were continually entering into various occupations and after a period of growth and development they would lose their vigor in dealing with the problems of their economic environment and depart from the market to make room for new firms. Techniques of production and the organization of the market were continually changing. Some of these changes arose from various individuals, subject to the play of the market, acting continually so as to improve their position; some came about as a result of changes in the size of the population and of minor changes in tastes. No single change ever occurred in isolation, and full account was taken of the primary effects of changes within one firm upon other firms as well as the secondary effects of those induced changes upon the firm initiating the change, and so on. These changes were seldom ignored merely because they belonged to the second order of smalls. Seasonal changes in demand and in the conditions of |80| supply of the factors were observable. Thus, there was a fund of unemployed due to the frictional problems involved in factor adjustment; and with respect to labor, there was always the problem of the Residuum. The character of labor was continually changing. These changes involved improved skills, better education, a continual revaluation of leisure and an increasing willingness to accept the temporary exigencies brought about by the necessary adjustments to continual change. However, the volume of unemployment was never so great as to suggest a problem of the Keynesian sort, for with appropriate lags prices were generally flexible.

[11] The following characterization parallels that of G. W. Guillebaud, "Marshall's Principles of Economics in the Light of Contemporary Economic Thought," *Economica*, Vol. XIX, May 1952, pp. 111 ff.

The price level, as distinguished from variations in individual prices, was assumed to be reasonably stable and so the size of the national income was determined by the amount and efficiency of the factors of production utilized during any period. However, at no one time would a state of equilibrium obtain in the market; because of the ubiquitous nature of change and flux, equilibrium is merely a theoretical level (of output, wages, prices, profits, etc.) towards which the various sectors of the economy will tend.

The important individual in this situation was the "city man," who must make the innumerable decisions relating to all economic activities. His rationality and foresight explained the motivation which provided direction in this complex world and enabled it to |81| overcome the difficulties which are present in an advancing economy. This individual was for Marshall a man of flesh and blood; he was no Crusoe abstraction:

> . . . [he is] largely influenced by egoistic motives in his business life to a great extent with reference to them; but who is also neither above vanity and recklessness, nor below delight in doing his work well for its own sake, or in sacrificing-himself for the good of his family, his neighbours, or his country. . . [but whose] action of motive is so regular that it can be predicted and the estimate of the motor-forces can be verified by results. . . .[12]

This, then, was the end product of Marshall's analysis. He found it necessary, of course, to impound certain things in *ceteris paribus*; for example, he abstracted from the situations which are usually associated with cycle theory; and he found it occasionally necessary to assume that the purchasing power of money remained constant; or that there was an absence of foreign trade. But always he recognized that the impoundings were a temporary exigency, and that the inhabitants of the pound should be released taking their place with the rest of the pack as soon as they presented no danger to the measured flow of the argument. For Marshall looked upon the *ceteris paribus* as a literary device, useful solely for expediting the smooth flow of language; and a suitable measure of the argument's completeness (and Marshall felt that it was beyond his power to complete the argument during his lifetime) was to be found in the emptiness of the pound. |82|

[12] *Principles*, p. 27; also *Memorials*, p. 160.

One more preliminary remark should be made: It is sometimes argued that Marshall's method is that of particular equilibrium analysis as contrasted with general equilibrium. Such a statement is at least misleading and at most entirely incorrect. As has been mentioned, Marshall felt that, because of the inadequacies of the intellectual power of the individual, it would be desirable to start with the solution of lesser problems and then finally to put the preliminary solutions together in an attempt to understand the whole (*supra* p. 47-48). Milton Friedman has seen the issue clearly:

> The distinction commonly drawn between Marshall and Walras is that Marshall dealt with "partial equilibrium," Walras with "general equilibrium." This distinction is, I believe, false and unimportant. Marshall and Walras alike dealt with general equilibrium; partial equilibrium analysis as usually conceived is but a special kind of general equilibrium analysis—unless, indeed, partial equilibrium analysis is taken to mean erroneous general equilibrium analysis.[13]

Friedman correctly reflects Marshall's position, for Marshall preferred to look upon his work in technical analysis as a continuing amplification of his statement of general equilibrium. "My whole life has been and will be given to presenting in realistic form as much as I can of my Note XXI," he said in a letter to John Bates Clark in 1908.[14] (Note XXI[15] is the mathematical statement of the conditions for general equilibrium). |83|

Marshall's methodological viewpoint was expressed in a characteristic passage at the conclusion of his discussion of the development of economic doctrines:

> The modern economic organism is vertebrate; and the science which deals with it should not be invertebrate. It should have that delicacy and sensitiveness which are required for enabling it to adapt itself closely to the real phenomena of the world; but none the less must it have a firm backbone of careful reasoning and analysis.[16]

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[13] Milton Friedman, "The Marshallian Demand Curve," *Journal of Political Economy*, Vol. LVII, December, 1949, p. 463.

[14] *Memorials*, p. 417.

[15] *Principles*, p. 855-6.

[16] *Principles*, p. 769.

Marshall, then, proposed to be "loose with system" and to avoid "long chains of reasoning" which might lead too far from the observable data. He thus declined the invitation to join in the endless search for precision which, as Souter has emphasized, can lead only to one of the dead end alternatives in the quest for ultimate reality.[17]

A characteristic example of this "lack of precision," but one which proved of considerable use for Marshall's purposes, is to be found in the use of "normal" as it applied to wages, profits, and particularly to prices. In spite of his remark to J. B. Clark that ". . . my main position as to the theory of value and distribution was practically completed in the years 1867 to 1870 . . . ,"[18] |84| a very significant shift occurred in the use of the "normal" concept between 1879 and 1890. In the *Economics of Industry* written in conjunction with Mary Paley Marshall, the normal condition is defined as "That condition of a thing which would be brought about by the undisturbed action of free competition. . . ."[19] At this early date, then, normal was defined in terms of that situation prevailing if the undisturbed operation of the "forces of competition" is assumed, implying, subsequent to later modification, the absence of combination. Thus, the normal price of an item was defined as that price which, it would obtain in a market if the operation of the competitive mechanism were not disturbed.[20] The definition of normal wages and normal profits corresponded with this.

But in the *Principles*, "normal" has a different connotation:

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[17] The following analysis owes much in a general way to R. W. Souter, *Prolegomena To Relativity Economics*. (New York: Columbia University Press, 1933), pp. 73 ff. It is unfortunate that this work is so little referred to; to a certain extent this may be attributable to its highly polemical tone.

[18] *Memorials*, p. 416.

[19] Alfred Marshall and Mary Paley Marshall, *The Economics of Industry*, (2nd ed., London: Macmillan and Co., 1886), p. 66. This change in emphasis discussed above is perhaps one of the main reasons why Marshall always expressed discontent with the book and refused to permit its reprinting after the second edition.

[20] *Ibid*. p. 77.

> . . . we may say that the course of action which may be expected *under certain conditions* from the members of an industrial group is the *normal action* of the members of that group relative to those conditions.[21]

and further:

> In all these cases normal results are those which may be expected as the outcome of those tendencies which the |85| context suggests; or, in other words, which are in accordance with those "statements of tendency", those Laws or norms, which are appropriate to the context.[22]

Thus, where the market displays some degree of combination or some institutional imperfection, the normal condition no longer implied competition; rather it referred to the condition which will obtain when all of the elements, technological, psychological, institutional, and so forth have had an opportunity to fulfill the tendencies inherent in their presence. And so, by the time of the publication of the *Principles*, Marshall had come to feel that deviation from competition is frequently not of the kind that tends to disappear with the passage of time.[23]

This shift in emphasis shows how Marshall found a less precise definition of more use in his analysis. The initial confusion |86| perhaps occurred because he felt that the concept of competition was much simpler than it subsequently appeared upon a more extensive examination of the data. In this regard, Marshall never contrasted monopoly

[21] *Principles*, p. 34.

[22] *Principles*, p. 34.

[23] There is nothing "normative" about "normal" situations. We cannot associate directly the attainment of maximum satisfaction, in the technical economic sense, even with the universal achievement of normal price in all markets. Cf. *Ibid*., p. 35.

Marshall is also careful to distinguish average value from normal value. This is a distinction which is important in dealing with the representative firm. Average must be looked upon as a statistical or ex post concept. In other words, the average value (assuming the equivalence between price and value) of a commodity or a factor is simply the statistical average of the actual prices which prevailed on the market; whereas the normal value is that value towards which a commodity will tend (assuming conditions of knowledge such that one price will prevail) with due consideration for the characteristics of competition which can be considered permanent relative to the time period involved. Cf. *ibid*., pp. 347 f.; pp. 363 ff.; p. 372 f.

results with competitive results in terms of "bad" versus "good" but always "constructive" monopolies or "constructive" competitive firms with "destructive" monopolies or "destructive" competitive firms. Chapter IV of this study will be concerned with some of the ramifications of normal results in these four categories.

Marshall's position is best explained as follows: The normal condition can never be observed at a given moment of time, say 12:30 o'clock this afternoon. At 12:30 o'clock, the situation actually observed will be compounded of all the vagaries of the market place such as temporary ignorance, weather disturbances, changes in the rate of government expenditures for a short period, temporarily sanguine or pessimistic outlooks on the part of the trader, and so forth. None of these elements would be relevant to the normal period, for that period involves a length of time sufficient for the tendencies in existence at 12:30 o'clock to have worked themselves out and for the effects of the non-permanent elements of the market to have disappeared. The normal condition will never be reached, for it is only the condition potential in any given economic situation.[24] |87|

This brings us to the most difficult and obscure topic in all of Marshall's economics. As he said:

> It is true however that the condition that time must be allowed for causes to produce their effects is a source of great difficulty in economics. For meanwhile the material on which they work, and perhaps even the causes themselves, may have changed; and the tendencies which are being described will not have a sufficiently "long run" in which to work themselves out fully.[25]

Marshall was never satisfied with his analysis of the role of time in economic theory. In 1908, after virtually all his theoretical work had been completed, he pointed out to J. B. Clark that there is an immense deal to be done in ". . . in elaborating the influence of

[24] E.g., *Principles*, p. vii.

[25] *Principles*, p. 36.

time. . . [and] allowing for the decadence of some economic influences and the rise of others. . . ."[26]

What Marshall meant by time is never altogether clear. Frequently he made such statements as ". . . time is required to enable a rise in the price of a commodity to exert its full influence on consumption."[27] But the *Principles* also has many such statements as "The general drift of the term normal supply price is always the same whether the period to which it refers is short or long."[28] The temporal implication of these two statements is |88| different. In the first statement, Marshall was saying that when the price of a commodity rises, the lack of knowledge in the market will be overcome through a series of steps, the final step approximating the attainment of a new equilibrium position. However, in the second instance, the implication was that the tendencies present in the market will work themselves out whether the period is of short duration or of somewhat longer duration.

Redvers Opie, following some remarks of Bridgman, suggested that in dealing with Marshall's concepts we distinguish between "clock" time and "operational" time.[29] As Bridgman pointed out with reference to the second notion, which he also called "extended" time:

> Given any physical system, then it is possible to assign values to *ds* [the ultimate infinitesimal interval] such relations mathematically deduced by the principle of relativity correspond to relations between measurable quantities in the physical system; but that the things that we physically call *ds* are anything more than

[26] *Memorials*, p. 417.

[27] *Ibid*., p. 373.

[28] *Principles*, p. 110.

[29] Redvers Opie, "Marshall's Time Analysis," *Economic Journal*, Vol. XIL, June 1931, pp. 199 ff. For a critique of Opie's position cf. Souter, *op. cit*., pp. 45-6.

> approximately connected with the *ds's* required to give the mathematical relations, is at present no more than a pious faith.[30] |89|

But when the physical system is concerned not with the ultimate dimensional components of the universe but with the market place, it is possible to define the physical identity of *ds* with something more than pious faith. In any given economic context, the physical identity of *ds* will usually be clearly defined, for example, in cost terms, price terms, or demand terms, and so forth. Thus, *ds* being defined in terms of the cost of production, a manifold can be constructed relating such other elements as the number of firms, extent of knowledge, conditions of technological organization and so forth to the cost of production. As we shall presently see, this is exactly what Marshall does in constructing the long-run cost relationships.

Local time or "clock" time deals with the relationship between some arbitrarily established unit of measurement and other phenomena. With respect to this idea, Bridgman said:

> Local time is, therefore, a concept treated by the physicist even now as simple and unanalyzable. This concept is what most people have in mind when they think of time. Time, according to this concept, is something with the properties of local time; it was something of this kind that Newton must have meant by his absolute time, and it is the tacit retention of this sort of concept that is responsible for the difficulty so often found in grasping the idea of the relativity of simultaneity in local time.[31]

Clock time, which simply involves relating the elements of the system to some arbitrarily defined interval *outside* the |90| system, is the temporal notion Marshall had in mind when stating that the meaning of normal supply would be the same whether the period involved were long or short.

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[30] P. W. Bridgman, *The Logic of Modern Physics*, (New York: Macmillan Co., 1928), p. 73. A discussion utilizing a similar distinction is to be found in A. S. Eddington, *The Nature of the Physical World*, (New York: Macmillan Co., 1929), Ch. III.

[31] Bridgman, *op. cit.*, p. 77.

Marshall has pointed out that economists have their own Mecca—that of economic biology.[32] And it would be well for economists not to venture far along the path which leads to the Mecca of theoretical physicists, the general theory of relativity. But Marshall was vexed by the problem, and it would not be amiss to indicate that the solution proposed here has at least an honest tradition. One of the controversies between Newton and Leibnitz, to which Bridgman referred,[33] was concerned with the point of issue between clock and operational time. Newton held that true time was independent of, prior to, and posterior to work; it was absolute and continuous and events occurred in time which was moving on without reference to the events which were occurring in it.[34] On the other hand, Leibnitz argued that there can be no time independent of the event, insofar as time is actually but a way of recording a succession of events.

This controversy between Leibnitz and Newton was the beginning of the modern discussion of the problem. The position taken by both of them is but a stopping place in the ancient conflict |91| between those who would give priority to matter and those who would give it to the abstract idea. Leibnitz stands in the Platonist tradition: He had come to a conclusion, albeit for somewhat different and perhaps less subtle reasons, similar to that of Augustine. The latter's treatment of time suggested many elements which were later formalized in the Kantian doctrine of the transcendental aesthetic which treated time (and space) as forms which the mind imposes on a datum so that it might become knowable on a cognitive level as well as Bergsonian emphasis on time as an aspect of memory in the setting of the continuity of consciousness.[35]

A more general statement of the time problem, which establishes the relation between the subjective approach and that of modern physics as adumbrated by Leibnitz,

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[32] *Principles*, p. xiv.

[33] Bridgman, *op. cit.*, Ch. III, *passim*.

[34] Newton's position has not proven viable and has fallen into obscurity except, strangely enough, for certain modern semi-mystical cults.

[35] Saint Augustine, *Confessions*, trans. Vernon J. Bourke (New York: Fathers of the Church, Inc., 1953), pp. 327 ff., esp. p. 362.

is to be found in the position taken by Leo Chwisteck, the Polish logician and philosopher:

> . . . time is analyzed into separate temporal experiences in addition to which there is only the mathematical apparatus which serves to order them.
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> Experience teaches us that certain events are earlier and others later, just as there are events which are nearer and those which are farther. Experience enables us to assign certain numbers to temporal events. This as is known, is done with the help of a clock. Events are not something limited and independent. They are artificially abstracted from the totality of experience, which itself cannot be grasped. |92|
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> We call this process formalization. We assign to an event included in a pattern a certain class of numbers, which is called its spatial representation and a particular number which is called its temporal point.[36]

Chwisteck places emphasis on both the subjective elements and on the relative nature of time; but he also emphasized the fact that this essentially subjective process must be formalized in terms of some scalar system of enumeration. It is this scalar formalization that Marshall had in mind when he said:

> We should have made a great advance if we could represent the normal demand price and supply price as functions both of the amount normally produced and of the time at which that amount becomes normal. . .[37]

We must, however, return to certain considerations apropos of Marshall's use of the clock time concept. We have already indicated that he generally used this concept in reference to the duration of a period. In these cases, it may be treated as involving an adjectival qualification, i.e., one operational period is *longer* or *shorter* in duration than another. But another and very important use is made of the clock time concept: For purposes of explaining the relationship between various aspects of the economy it is necessary to reduce the operational periods of two different sets of relationships to a common base for |93| comparing or correlating their action. This is the task of the

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[36] Leo Chwisteck, *The Limits of Science*, trans. Helen Charlotte Brodie and Arthur P. Coleman, (New York: Harcourt, Brace and Co., 1948), p. 238.

[37] *Principles*, p. 238.

historian; it is impossible to discuss in any meaningful way an historical nexus without relating operational periods of varying duration. As Marshall points out with respect to price changes:

> A chief cause of the apparent differences in character between the price movements of different commodities lies in the fact that a period, which is long relatively to the conditions of supply of one thing, may be short relatively to those of another. . . . Thus the answer to the question whether variations in demand, or variations in cost of production, exert the stronger influences on value under competitive conditions in a given time, depends mainly on *the ease with which supply can alter its pace*.[38]

Various processes involved in Marshall's use of time as an operational concept will be dealt with in detail during the remainder of this study. But as a preliminary to the more extended discussions, a few examples might be indicated. In demand analysis, the process necessary for overcoming those difficulties associated with ignorance is treated in terms of time; in the case of supply, time refers to those processes making for increased or decreased costs of production; and in the case of rent, the process referred to is that of overcoming factor fixity. To emphasize the point again, in every situation where time is used in the operational sense a process of change is involved. |94|

When the system being discussed is an economic or a social one as contrasted to one relating to physical data, either the clock time or the operational time concept may be useful depending upon the nature of the problem. Eddington has made clear the pragmatic nature of the concepts in an interesting little parable:

> I have sometimes thought it would be very entertaining to hear a discussion between the Astronomer Royal and, let us say Prof. Bergson on the nature of time. . . . There would then probably have been a keen disagreement, and I rather think that the philosopher would have had the best of the verbal argument. After showing that the Astronomer Royal's idea of time was quite nonsensical, Prof. Bergson would probably end the discussion by looking at his watch and rushing off to catch a train which was starting by Astronomer Royal's time.[39]

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[38] *Industry and Trade*, p. 396.

[39] Eddington, *op. cit.*, p. 36.

In two instances, it is possible to see clearly both the use Marshall made of his peculiar time concepts and his insistence on the continuity and the changing nature of events. The first is found in his attitude towards the conceptual device of the stationary state; the second has to do with certain aspects of his treatment of rent. With reference to the stationary state, Marshall, in discussing the adaptation of the several factors of production to demand, remarked:

> Of course the period required to adapt the several factors of production to demand may be very different. . . . And this cause alone would prevent any rigid division |95| being made between long and short periods. But in fact a *theoretically perfect long period* must give time enough to enable not only the factors of production of the commodity to be adjusted to the demand, but also the factors of production of those factors of production of those factors of production to be adjusted and so on; *and this, when carried to its logical consequences, will be found to involve the supposition of a stationary state of industry, in which the requirements of a future age can be anticipated an indefinite time beforehand* [italics mine].[40]

Thus, he felt that the stationary state, when looked at in terms of the logic of his time period analysis, involved a *reductio ad absurdum* of the long period normal model. That is, the stationary state could only be thought of as involving a condition in which all the processes of the economy had reached a state of final equilibrium. (It will be remembered that the long run normal model abstracts from elements of secular and cyclical change.) However, Marshall never denied that the stationary state constituted a possible alternative in dealing with the value problem:

> Our first step towards studying the influences exerted by the element of time on the relations between cost of production and value may well be to consider the famous fiction of the "stationary state" in which those influences would be but little felt; and to contrast the results which would be found there with those in the modern world.[41]

But in spite of the fact that Marshall acceded to the use of the stationary state on logical grounds as a possible approach to the value problem, Opie is somewhat less than fair in

[40] *Principles*, p. 379n.

[41] *Ibid*., p. 366.

suggesting that |96| he ". . . could not put the stationary state concept wholly behind him."[42] For as Marshall said:

> The statical theory of equilibrium is only an introduction to economic studies; *and it is barely even an introduction to the study of the progress and development of industries which show a tendency to increasing return.* [italics mine]. Its limitations are so constantly overlooked, especially by those who approach it from an abstract point of view, that there is a danger in throwing it into definite form at all.[43]

Another important danger of this analysis, then, is to be found in those industries enjoying increasing returns. In anticipation of our subsequent discussion, it should be pointed out that the heart of the increasing returns doctrine for Marshall was that the firms in industries enjoying increasing returns will continually be expanding in size. It would, therefore, be inconsistent to treat those firms in terms of the ". . . theoretically perfect long run . . . involve[ing] the supposition of a stationary state of industry . . .,"[44] for such a treatment would not be responsible to the facts of the field.

In a letter to Clark, Marshall expresses himself with a clarity that can leave little doubt:

> What I take to be a static state is—to amplify a phrase which was all too short—a position of rest due to the equivalence of opposing forces which tend to produce |97| *motion. I cannot conceive of any Static state, which resembles the real world closely enough to form a subject of profitable study*. . . [italics mine].[45]

In fine, Marshall did not feel the stationary state to be usefu1 because (a) it violated his beliefs as to the role of time in economic analysis, for it precluded taking account of the various processes involved in the relevant economic relationships; and (b) it did not permit the proper consideration of the influence of increasing returns.

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[42] Opie, *op. cit.*, p. 202.

[43] *Principles*, p. 461.

[44] *Ibid*., p. 379n; also p. 810.

[45] *Memorials*, p. 415.

Similarly, much of the confusion concerning Marshall's treatment of rent arises from a failure to appreciate his use of time. There has been so much perplexity as to the relationship between the normal price model and the rent doctrine, a perplexity which must be in no small measure attributed to Marshall's obscurity, that it might be of some purpose to indicate that the key to the rent problem is also to be found in Marshall's treatment of time.

A useful point of departure in the rent discussion is to be found in Ogilvie's strictures on Marshall's analysis. Ogilvie arrives, after an ingenious and selective construction of what he felt to be Marshall's views, at the following conclusions:

> (1). . . the various incomes from appliances do not shade into one another gradually, but. . . there is a sharp distinction between all free capital and all investments or embodyments of capital. . . . |98|
>
> (2). . . that rent is substantially like other payments for things which are both useful and scarce.
>
> (3). . . there remain, and of prime importance, those surpluses in some things over other things which have long interested both theorists and men of affairs—a surplus in the receipts of some landlords over their capital-and-labour costs, a surplus in the receipts of some tenants over their capital-and-labour-and-land costs, and excess in the profits of some business men over their own profits at a previous datum line. . .[etc.] a surplus of this kind could not be called like the rent of land, for normally the rent of land is not like that.[46]

These conclusions are inextricably bound with the controversy as to whether the rent of land is a cost of production and hence determines price or whether it is a surplus and as such is determined by price.

Marshall treated "land" not as unique but merely as another factor of production differing only in degree from other factors of production as to the qualities of durability, availability and reproducibility:

> And there is no sharp line of division between floating capital and that which has been 'sunk' for a special branch of production, nor between new and old

[46] F. W. Ogilvie, "Marshall on Rent," *Economic Journal*, Vol. XL, March 1930, p. 21.

> investments of capital; each group shades into the other gradually. And thus even the rent of land is seen, not as a thing by itself, *but as the leading species of a large genus* [italics mine]; though indeed it has peculiarities of its own which are of vital importance from the point of view of theory as well as price.[47] |99|

The process of speciation within that large genus comes about because the factor may potentially undergo a slightly different process. In Marshall's terms, it is the passage of time that makes it possible to distinguish between the various members of the genus. In a letter to J. B. Clark, he emphasized this position in the strongest fashion:

> For in that world it seems to me that the stock of capital is not fixed as the stock of land is; that the sacrifice of waiting (marginal) is part of the cost of production of capital, and therefore of the cost of production of things made by it. And it seems to me that, as no similar proposition is true of rent proper in relation to land proper, I must continue while I live to assert that *for long periods*, THOUGH NOT FOR SHORT, interest and rent stand to value in wholly different relations.[48]

In other words, in the short run both the stock of capital and the stock of land is fixed. Therefore the nature of the process during the short period, which may occur to either land or capital, is the same; hence, the return in both cases is properly called rent. And, *a fortiori*, if the process which occurs is *not* the same, designating the return as rent could be misleading. Thus, for periods of somewhat greater length the degree of reproducibility of capital and land varies; so, it is more convenient to designate the return to the former as a "quasi-rent." For periods of |100| sufficient duration so that the process was one potentially involving perfect reproducibility, Marshall designated the return as "interest." Perhaps to avoid a lack of conformity with the common parlance for those factors whose return could be treated as a rent or a quasi-rent, he retained the traditional terminology of "land" for natural and perfectly fixed factors and "capital" for those factors capable of any degree of reproducibility. Marshall always felt it was impossible to draw any clear lines of distinction between those material factors which give rise to income other than in, terms of the process which they are capable of undergoing. Here again Marshall

[47] *Principles*, p. 412.

[48] *Memorials*, p. 413.

returned to the notion of *natura non facit saltum*; and in this case as in so many others, drawing the line in *any* definite place was held to be far more confusing than useful.[49]

Marshall was aware of the distinction between scarcity rents and transfer rents (or differential rents as he preferred to call them). In general, he treated this distinction in the same pragmatic fashion as not reflecting underlying real differences but as being useful only for purposes of explanation:

> In a sense all rents are scarcity rents, and all rents are differential rents. But in some cases it is convenient to estimate the rent of a particular agent by comparing its yield to that of an inferior (perhaps a marginal) agent, when similarly worked with appropriate appliances. And in other cases it is best to go straight to the fundamental |101| relations of demand, to the scarcity or abundance of the means for the production of those commodities for making which the agent is suitable.[50]

Marshall's position may be briefly summarized: First, for the firm during a very short period, i.e., before the processes which are associated with the passage of time have had an opportunity to get underway, certain of the factors of production, viz., land, capital, and perhaps labor of unusual ability, must be treated as fixed; in this case, the fixed factors will receive as their income the amount of the difference between total prime cost and price. This payment is of the nature of rent, and in the sense that production will still continue for a short period without an excess of price over prime cost, is "price determined" instead of being "price determining." Second, in the case of capital and of highly specialized labor, if we take as the relevant period one sufficiently long for the process of replacement and construction of new equipment to become effective, then the return to those factors may best be treated as interest or wages; and a return must be paid to ensure the supply of those factors. They must, therefore, be treated as "price determining." Third, the distinction between differential and scarcity rent is useful for purposes of exposition in that it may not always be feasible to begin with the unit which will just cover the cost of |102| its use. But in any case, the total amount of

[49] *Principles*, pp. 415 ff.

[50] Principles, pp. 422-3.

rent, or its effect will be the same whether it is analyzed into differential rent or scarcity rent or some combination of each.[51]

To return to Ogilvie's conclusions as to Marshall's rent doctrine, it is apparent that he has largely failed to comprehend Marshall's analysis of the processes involved in operational periods of differing lengths: (1) There is a sharp distinction between free capital and investments during a short period when the investment cannot be replaced, but as the process associated with time works itself out, it is no longer useful to hold to the distinction because the elements of both prime and supplementary cost are replaceable; and further, profit or interest must be paid in the long run before those elements composing supplementary cost would be forthcoming. (2) The payment for land should be distinguished from the payment for other factors because the process occurring will not allow the replacement of land;[52] and as such |103| its payment will be a residual even in a period which is the clock time equivalent of the process associated with capital. The normal amount of that residual will be determined by the price for the commodity of which it is a factor. (3) It is true that there are many surpluses in short periods where the process has not been allowed to attain a position of equilibrium with respect to all of the relevant conditions of supply and demand. However, to consider these surpluses in abstraction from the length of the process involved would tell only the least interesting portion of the story.[53]

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[51] Much more could be said on the subject of Marshall's rent analysis concerning which he could receive both praise and blame. For example, his treatment of the relationship between the extensive and the intensive margins was cleared of many of the obscurities accumulated from Smith's time onward; on the other hand, the distinction between the role of rent for the industry and economy and the role of rent for the firm is extraordinarily abstruse: When the analysis deals solely with the firm, very little difficulty is encountered; but when discussing the determination of industry price, the propriety of treating rent no longer as "price determined" for the firm is never faced in a clearcut fashion. We have not discussed the rent issue fully. With all of its various qualifications, it is only indirectly germaine to the central problem of Marshall's treatment of time in the context of long run normal price.

[52] The return to improvements on land are treated by Marshall as quasi-rents.

[53] The position taken here is similar to that of M. Tappan Holland, "Marshall on Rent, A Reply to Professor Ogilvie," *Economic Journal,* Vol. XL, Sept. 1930, pp. 369 ff.

It should by now be clear that Marshall's treatment of the element of time is strikingly different from the approach of the post-Marshallian theorists. Marshall's analysis cannot be meaningfully called either static or dynamic: It is not static in the sense that the primary concern is with the nature of the processes which occur in the various parts of the system; and it is not dynamic in the general sense that Marshall impounded in *ceteris paribus* those elements which are usually associated with secular and cyclical change. The analysis can, however, be called theoretical in the sense that there is no attempt to make it *exactly* correspond with the observed data. Marshall simply began with the assumption that the data with which he had to deal are representative enough of a system in the process of continual change. But in order to properly |104| Analyze this system, it is necessary to assume that certain elements are non-operative; hence, the effects of the remaining elements are analyzed one by one with the final purpose of understanding the whole.

Up to this point, our concern has largely been with an explanation of the role of time in Marshall's analysis. We have emphasized the relationship between time as Marshall used it and his preconceptions as to certain basic philosophical problems as well as certain implications for method. In addition, the meaning of "normal" and some of its implications have been developed. The remainder of this chapter will deal with the specific elements involved in the long run normal price model, namely, diminishing and increasing returns, the economies and diseconomies of production, and certain other theoretical problems connected with these.

Marshall preferred to treat the problem of returns in terms of the physical product involved rather than in money terms for two reasons. First, a discussion of the problem in terms of physical product avoids the pitfalls associated with confusing the tendency towards a profit or a loss operation with the tendency towards increasing or diminishing returns. As he said:

> To measure outlay and output in terms of money is a tempting, but a dangerous resource: for a comparison |105| of money outlay with money returns is apt to slide into an estimate of the rate of profit on capital.[54]

Second, it is possible that other elements involved in external or internal economies or diseconomies because of their effect on total cost may outweigh the tendency towards either increasing or diminishing returns. This is a corollary of the first proposition:

> Such changes [the building of a new railroad or an increase of the population] will be of vital importance when we come to draw inferences from the law of diminishing returns, and particularly when we discuss the pressure of increasing population on the means of subsistence. They have no bearing on the law itself, because that has to do not with the value of the produce raised but only with the amount.[55]

Marshall's analysis of the principle of returns involved the same considerations *vis-a-vis* the problem of time as the rent analysis. He was concerned with the process in terms of the real-cost changes occurring during any given period as a result of varying the factors of production. His treatment of the problem is not the same as that of the post-Marshallian theorists but must be looked at as being still in the classical tradition. The modern analysis is derived largely from Edgeworth's |106| mathematically elegant statement of what became known as the law of variable proportions. Edgeworth was concerned with the results which would obtain from the application of alternative "doses" to a fixed factor:

> . . . when on the application of two . . . doses of productive power the increment of product due to the two doses has to the increment of product due to the first dose alone a ratio greater than the ratio which the sum of the two doses has

[54] *Principles*, pp. 320-1. In a footnote (p. 321n.), Marshall continues: "There is no general rule that industries which yield increasing returns show also rising profits. No doubt a *vigorous* firm, which increases its scale of operations and obtains important (internal) economies which are peculiar to it, will show an increasing return and a rising rate of profit. . ." [italics mine].

[55] *Ibid*., p. 149.

> to the first dose, Increasing Return acts; and conversely if the former ratio is less than the latter, Diminishing Return.[56]

Edgeworth then continued with a statement of the average and marginal conditions. Most of the discussions since Edgeworth's have followed this analysis; and the difference between this approach and Marshall's has been the source of many remarks (*supra* pp. 76-77 ff.) on the latter's allowing historical or dynamic elements to intrude into a basically static model.

A part of this confusion comes from Marshall's unfortunate use of the term "dose," which would seem to indicate that he was thinking of the returns resulting from the application of *alternative* increments of one factor to a fixed factor. A second source of confusion is his recurring reference to "proportional returns" instead of a more careful terminology (although the incremental notion is carefully spelled out in several places). The difficulty |107| here is stylistic. The idea of the increment is essentially mathematical, and Marshall, in his attempt to make these propositions understandable in a general way to the business man, constantly sought for simplified methods of expression even at the sacrifice of some verbal accuracy.

The earliest statement of the Marshallian position respecting the law of diminishing returns occurs in the *Economics of Industry* (1879):

> An increase in the amount of capital applied in the cultivation of land causes in general a less than proportionate increase in the produce raised.[57]

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[56] F. Y. Edgeworth, *Collected Papers Relating to Political Economy*, (London: Macmillan and Co., 1925), I, 61 ff.

[57] *The Economics of Industry*, *op. cit.*, pp. 22-3. In a footnote (*idem*), Marshall states: "The statement that after a certain number of doses have been applied to any given piece of land, the return due to each additional dose will be less than those due to the preceding doses may be illustrated by figures." There follows the customary analysis in terms of parallelograms representing O_x as equal divisions of capital and O_y as units of output. He distinguishes two cases: (1) The output due to additional doses of capital begins to decrease immediately and (2) the output first rises and then begins to decrease. Marshall concludes: "But the Law of Diminishing Return does not state that this diminution will in every case commence at once; the returns to the first few

In discussing diminishing returns as applied to land, Marshall remained faithful to the tradition of English Political Economy. The most heated controversy in academic as well as non-academic circles in England throughout the first half of the Nineteenth Century was over the corn laws. This controversy was closely linked to the theoretical conception of diminishing returns. The |108| argument was a simple one: Land was relatively fixed for a country like England, with the result that the only way of increasing the food supply was by the additional application of labor and capital to that fixed amount of land. This led to a diminishing return of food for each application of the additional factor. If the importation of grain was forbidden or encumbered by a tariff, the only recourse would be to utilize land and labor in this increasingly uneconomical fashion. The result would be a lower national product and a change in relative income shares in favor of the property owners. Even though the issue of the corn laws was settled by their repeal in 1843, several generations of English political economists took as their polemical orientation (to borrow an expression of Talcott Parsons), the problem of free trade *versus* protection. The result of this orientation was a predilection for treating diminishing, returns as though it referred to land, although the wider applicability of the principle was recognized.[58]

Marshall's analysis of diminishing returns, as we have already mentioned, differed sharply from that of Edgeworth and those who have |109| followed Edgeworth's lead in defining the concept in terms of alternative applications. Marshall borrowed the term

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doses may be small, and the returns to the larger doses may be larger. . . All that the Law states is that after a great number of doses have been applied, the return must diminish."

[58] It should be added that Marshall could not be called a "free trader." He recognized that the appropriateness of tariffs and the requisite degree of protection, if any, should depend solely upon the state of development of the country. Clearly "new" countries would need some measure of protection for their nascent industrial organizations if such protection were not provided by the natural circumstances of their environment, while more mature countries would probably need a measure of protection only in exceptional circumstances. *Inter al*., *Money Credit and Commerce*, Ch. XXII, *passim*.

"dose" from James Mill.[59] For Mill, "dose" referred to the amount of factors added to land at the beginning of each period of production. Diminishing returns occurred if the amount of product in period t_2 was *proportionately* less than in period t_1 though the "dose" of the variable factor added between t_1 and t_2 was greater than that added between t_0 and t_1.

Marshall, following James Mill, treated diminishing returns in terms of what would happen if increasing amounts of the variable factor were added to land during a sequence of periods. He always discussed the evidences for diminishing returns in the historical context. As he said: "We learn from history and by observation . . ."[60] that in any one country the farmers will start with the most efficient and most fertile lands and, as the demand for foodstuff increases, will move on to the less fertile lands; or the farmers will apply an increased amount of capital and labor to existing land. In actual practice, these two processes will occur simultaneously with these applications yielding smaller incremental outputs. Thus, diminishing returns will occur at both the extensive and intensive margins.[61] |110|

The application of the law of diminishing returns to any one crop or to any one period of time would, Marshall felt, involve a questionable procedure:

> The great classical Law of Diminishing Return has its chief application, not to any one particular crop, but to all the chief food crops. . . . It refers to a country the whole land of which is already in the hands of active business men, who can supplement their own capital by loans from banks wherever they can show it is likely to be well applied; and asserts that an increase in the total amount of capital applied to agriculture in that country will yield diminishing returns of produce in genera1.[62]

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[59] Jarnes Mill, *Elements of Political Economy*, (1st ed.; London: Baldwin, Cradock, and Joy, 1824), pp. 13 ff.

[60] Esp. *Principles*, pp. 130 ff.

[61] Idem.

[62] Ibid., p. 408.

The concept of decreasing returns may be, of course, extended to manufacturing. In doing this, Marshall emphasized the asymmetry between diminishing returns in industry and diminishing returns to land in treating the existence of diminishing returns in industry as being due to the *inappropriate* application of the factors of production which result from the inefficiencies of management.[63] But whereas in the long run (if we assume a "mature" economy in the sense of the available land having been appropriated for use) the farmer has no other alternative except the increasing application of labor and capital to his land with the inevitable result of diminishing returns, a manufacturing or a commercial enterprise |111| can alter the productive arrangements by embarking on new managerial policies.[64]

Thus, Marshall felt that diminishing returns are not important *long run* considerations for industry:

> It [diminishing returns from agriculture] is therefore on a wholly different footing from those tendencies to diminishing return which arise when any producer distributes his resources inappropriately; as when a farmer takes either more land or less land than is appropriate to his capital: or when the number of planing machines in a locomotive factory is either so large that several of them are habitually idle, or so small that work is frequently held up to wait for the planing machine. Such troubles are not very frequent: they are transitional: they do not enter as a primary factor into the conditions of human progress: and some little confusion seems to have been caused by speaking of the permanent tendency to Diminishing Return as though it were merely a particular instance of numerous passing incidents. For they do not, as it does, materially affect the rise and decline of nations, or threaten to oppose, ere many centuries have passed, a stern opposition to further increase of the population of the world.[65]

[63] It would be possible to preserve a degree of symmetry by attributing such inefficiencies to a fixity of the management factor; but such symmetry would be purchased at the cost of what Leontief has called "implicit theorizing."

[64] *Principles*, pp. 407 f. It is, of course, assumed that the farmer has exhausted the possibilities of farm technology available to him during the period relevant to the long run.

[65] *Industry and Trade*, pp. 189-190n.

An examination of the principal germaine passages in Marshall's work discloses almost no reference to a tendency towards diminishing returns in industry in the long run except those associated in some manner with the inefficiencies .of management.[66]

The earliest statement of the principle of increasing returns is to be found in *The Economics of Industry*: |112|

> It will be useful to refer to the *Law of Division of Labour*:—When the demand for a commodity becomes very large, the process of making it is generally divided among the several distinct classes of workers, each with its proper appliances, and each aided by Subsidiary industries. It leads the way to the *Law of Increasing Return*, which is:—The division of Labour tends to diminish the difficulty of making a commodity, and therefore to increase the return obtained by a given amount of effort.[67]

In this earlier account, Marshall placed the emphasis on the effect of the division of labor. In the *Principles*, the statement is somewhat more general:

> The *law of increasing return* may be worded thus:—An increase of labour and capital leads generally to improved organization, which increases the efficiency of the work of labour and capital.[68]

The importance of this definition for our purposes lies in the fact that Marshall did not limit the process involved in the period relevant to increasing returns to a simple addition of factors; he assumed that it would also be necessary to change certain of the productive processes along with the addition of those new factors. Marshall further emphasized this position:

> Increasing Return is a relation between a quantity of effort and sacrifice [meaning the real costs of production] on the one hand, and a quantity of produce on the other. The quantities cannot be taken out exactly, because *changing methods*

[66] Esp. Principles, pp. 168-170, 407-409, 356, 537. *Industry and Trade*, pp. 189-190.

[67] *Economics of Industry*, p. 57.

[68] *Principles*, p. 318.

> *of production call for machinery, and for unskilled and skilled labour of new kinds and in new proportions*. [italics mine].[69] |113|

Thus, he again implied that management must be treated throughout the discussion as being capable of deciding correctly the proper combinations of factors at every level of output. To the extent that management is not capable of doing this, there will be a tendency for returns to decrease relatively to what would have occurred had the proper decisions been made. In the short run, an increase in output will generally result in diminishing returns; but in the long run the pressure from more able entrepreneurs within the industry will effect a proper allocation of resources for that level of production which will assure the continuation of increasing returns.[70]

Marshall's treatment of constant returns is consistent with his treatment of increasing and diminishing returns. In any given productive situation, it is possible that extensive use will be made of a fixed factor, that is, one which for physical or institutional reasons is not reproducible in the relevant period. There will then be a tendency both towards increasing and diminishing returns; if the two tendencies should exactly balance one another out, a condition of constant returns would obtain.[71] Marshall felt that this contingency must be looked upon as accidental and, therefore, not worthy of serious consideration. |114|

Allyn Young, in a discussion of one of the principles from the *Wealth of Nations*, viz., that the division of labor is limited only by the extent of the market, was closer to Marshall's position than almost anyone else. He, too, saw the principle of increasing returns as a framework for ordering historical and statistical data rather than in the limited form of technological input-output ratios:

> First, the mechanism of increasing returns is not to be discerned adequately by observing the effects of variations in the size of an individual firm or of a

[69] *Ibid*., p. 319.

[70] *Principles*, pp. 409, 456 f.

[71] *Ibid*., p. 318-9.

> particular industry, for the progressive division and specialisation of industries is an essential part of the process by which increasing returns are realized. What is required is that industrial operations be seen as an interrelated whole. Second, the securing of increasing returns depends upon the progressive division of labour, and the principal economies of the division of labour, in its modern forms are the economies which are to be had by using labour in roundabout or indirect ways. Third, the division of labour depends upon the extent of the market, but the extent of the market also depends upon the division of labour. In this circumstance lies the possibility of economic progress, apart from the progress which comes as a result of the new knowledge which men are able to gain, whether in the pursuit of their economic or of their noneconomic interests.[72]

Marshall nowhere makes what may be construed as a general statement of the principle of returns. However, one may be reconstructed from the foregoing discussion as follows: In the absence of any fixity of the factors of production, and assuming that the entrepreneur has the ability to combine factors in |115| proportions giving optimum efficiency for any level of output, or that he is forced to optimum combinations by the pressure of competition, increasing returns will always occur; in production and commercial ventures, then, where land (taken as a rubric for ultimately fixed factors) plays a very minor role, the long run will result in increasing returns for the industry as a whole. On the other hand, to the extent that land does play an important part in the productive process, there will be a tendency towards diminishing returns. As an accidental result, the amount of land might be such as to cause, a tendency toward diminishing returns, which would be exactly equal to the tendency towards increased returns as a result of an increased application of the other factors: The result would then be constant returns.

Two of the most controversial elements in Marshall's theoretical formulation are introduced in the context of the division of labor; namely, his analysis of external and internal economies. Marshall made extensive use of these constructs as a framework for the vast amount of data he had collected relevant to the development of industrial

[72] Allyn Young, "Increasing Returns and Economic Progress," *The Economic Journal*, Vol. XXXVIII, December 1928, p. 527.

organization. Subsequently, much of the discussion in the *Economic Journal* controversy over the applicability of a number of Marshallian theoretical devices turned on the question of whether the categories of external and internal economies could be of decisive use in determining the future of competitive market organizations (*infra* pp. 134 ff.). |116|

External economies are those economies which will predominate, in industries containing a relatively large number of firms, the greater part of whose productive advantages come from location or the sharing of mutual knowledge and experience. Internal economies are those economies which will in general predominate in firms which are able to utilize all of the productive advantages of the division of labor within their own plant or business. As Marshall said:

> . . . we will resume our inquiry as to how far the full economies of division of labour can be obtained by the concentration of large numbers of small businesses of a similar kind in the same locality; and how far they are attainable only by the aggregation of a large part of the business of the country into the hands of comparatively small number of rich and powerful firms, or, as is commonly said, by production on a large scale; or in other words, how far the economies of production on a large scale must needs be *internal*, and how far they can be *external*.[73]

Marshall's concern was solely with an analysis of those aspects of industry structure which would lead as a result of the expansion of industry output, to a growth in concentration of production in the hands of a few firms or to a proliferation of the number of firms. The question as to whether an economy is external or internal depends upon the firm psychology: If there is a trend in the industry towards lower costs, *but which the firm feels it cannot affect by any of its activities*, then that |117| trend should be treated as an external economy; however, if the firm can affect the cost trend by its own decisions, then the economy must be treated as internal. An important corollary follows from the existence of internal economies: If the rewards associated with decreased per unit costs can be obtained by the decisions of the firm itself to expand production, then

[73] *Principles*, p. 277.

there will be a tendency towards an increase in size that will only be limited by the extent of the market or by the intervention of some kind of monopolistic arrangement able to enforce market stability.

But, if the predominating economies are external, additions to industry output will result from additions to the total number of firms operating in the industry; and in the absence of some extra-economic intervention the industry will remain competitive. Thus, the strategic importance of external and internal economies for Marshall is to be found in the use he made of these concepts in explaining whether the economies underlying any expansion of the market are such as to result in an increased concentration or in continued competition.[74] |118|

In general terms, the distinction between internal and external economies is found in the advantages which arise on the one hand as a result of the division of labor and on the other as a result of the location of industry. With respect to economies of location, which are generally external to the firm, Marshall stressed those which depended upon the general fund of skill and machinery available, not as a result of the size of the firm but because of the aggregate volume of production in the neighborhood.[75] A second and related source of external economies is found in the "conjuncture" or the state of the arts and the level of economic culture for the nation, or perhaps even the world as a whole.[76] All those things making for a more efficient general source of labor improving the general knowledge of conditions of production or making certain economies available to

[74] Esp. *Industry and Trade*, pp. 167 ff. This interpretation is fully confirmed by Marshall's discussion of the historical evolution of large scale enterprise and its increasing domination of the market with a corresponding increase in concentration in terms of the transition in importance from external economies to internal economies as the industrial revolution proceeded (*infra* pp. 177 ff.)

[75] E.g., *Principles*, pp. 265-6; 279; 284.

[76] *Ibid*., p. 266.

an entire industry that occur without or in spite of the conscious activities of the firms within the industry, are external economies.[77]

It is seldom possible to distinguish clearly between external and internal economies. We might paraphrase a famous dictum of Marshall's and say that: "External economies are seen, not as a |119| thing by itself, but as the leading species of a large genus; though indeed they have peculiarities of their own which are of vital importance from the point of view of theory as well as of practice." They generally accompany one another, and the processes that are involved in the passage of time such as an increase in the amount of vertical integration, may make economies that were once external become internal. In the last analysis, we must return to the criterion for distinguishing the two which was suggested above: Can the nature and extent of the economy be affected directly by any action taken on the part of the firm itself.

With this test in mind and with an understanding of the role played by these concepts, viz., as a method of analysis of the tendency towards concentration, it is difficult to see the relevance of F. H. Knight's remarks:

> . . . the doctrine of "external economies,". . . surely rests upon a misconception. Economies may be "external" to a particular establishment or technical production unit, but they are not external to the industry if they affect its efficiency. The portion of the productive process carried on in a particular unit is an accidental consideration. External economies in one business unit are internal economies in some other, within the industry. Any branch or stage in the creation of a product which offers continuously a chance for technical economies with increase in the scale of operations must eventuate either in monopoly or in leaving the tendency behind and establishing the normal relation of increasing cost with increasing size.[78] |120|

[77] Marshall's treatment of internal economies arising out of the division of labor within the firm was in the classical or pin factory tradition. For our purposes, no special discussion of his analysis at this point is necessary. Cf. esp. *Industry and Trade*, Bk ii; and *Principles*, Bk IV, Ch. vi-xiii, *passim*.

[78] Frank H. Knight, "Fallacies in the Interpretation of Social Cost," *The Ethics of Competition*, (New York: Harper and Brothers, 1935), p. 228.

Much of what Knight says is entirely correct: Whenever a firm has a motive to expand, then it will expand. To the extent that economies can be attained by the action of the firm they can no longer be counted as external to the firm. But to say that with the growth of the industry some economies which were formerly external become internal to the firm because of the increase in its absolute size is still not to deny the usefulness of the concept. And the implication that increasing costs are the "normal" situation is either an *ipse dixit* and hence not worth considering or, more likely, is based on an entirely different definition of increasing costs than that used by Marshall. It would, in fact, be difficult to adjust the definition of external and internal economies to the mathematically precise statement of the law of variable proportions because they describe an expansion process involving the passage of time.

The "representative firm" is first introduced as an important part of the analysis when Marshall begins to apply the categories of diminishing and increasing returns to specific market problems. As he said:

> We shall have to analyze carefully the normal cost of producing a commodity, relatively to a given aggregate volume of production; and for this purpose we shall have to study the expense of a representative producer.[79] |121|

Marshall then defined the representative firm in another example of his preference for looser forms of definition in which the maximum amount of empirical data could be arrayed:

> But our representative firm must be one which has had a fairly long life, and a fair success, which is managed with normal ability, and which has normal access to the economies, external and internal, which belong to that aggregate volume of production; account being taken of the class of goods produced, the conditions o marketing them and the economic environment generally.[80]

Thus, the representative firm may also be looked upon as the vehicle for carrying the empirical burden of increasing and diminishing returns when dealing with an industry.

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[79] *Principles*, p. 317.

[80] *Principles*, p. 317.

The question might arise as to why Marshall did not utilize the various statistical techniques available in analyzing the industry; why did he prefer to identify the elements of the whole industry with the counterpart of those elements which might be possessed by a single firm? A part of the answer is found in Marshall's distrust of the use of averages (cf. *supra* p. 87n for a mention of the same problem in the definition of "normal"). First, the average did not give the true picture of the prevailing level of activities at any one time. This is the import of his remarks to Bowley in a letter dated February 21, 1901: |122|

> . . . I of course accept the rule that, other things equal, it is more important to multiply items for an index number than to adjust weights: indeed, I regard the rule as almost too obvious to need proof. But I hold that in economics other things are so often not equal that greater proportionate stress ought to be laid on the necessity of examining each case to see whether the weights are important or not.[81]

Second, Marshall felt that averages could not possibly describe direction which the process might be taking. In any given industry, therefore, it might even be necessary, when using the much safer expository device of the representative firm, to change the identity of the representative firm as the organization and the structure of the industry changes. For example, in one stage of development, the representative firm might properly be a single proprietorship; and in a later phase of the development, it might be a joint stock company. These changes in the nature of the data cannot adequately be reflected by the statistics of averages.[82] Marshall suggested a further caution. Wherever possible, two firms in an industry should be selected as representative instead of one, because it is possible in selecting only one firm that certain important trends might be overlooked which were not fully represented in the one firm.[83] |123|

Through a careful and meticulous use of the mathematics of averages and trends, a series of quantitative expressions giving central trends and tendencies for the industry

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[81] *Memorials*, p. 421.

[82] *Industry and Trade*, pp. 314-5; Also cf. *Principles*, p. 810.

[83] *Principles*, p. 318.

might be devised. And if these expressions were combined with a discussion of the psychological nature of entrepreneurs "on the average" and the general environment of the industry, a complex machine of explanation at least as suitable for descriptive purposes as Marshall's representative firm might be constructed. But it would entail all of the difficulties which Marshall wished to avoid in what he felt to be the central task of economic theory: an analysis of the process of growth and development (cf. *supra* p. 40 ff.). Rogin has, in this connection stated the purpose of the representative firm:

> The representative firm should, nevertheless, be recognized for what it is—an instrument for simplifying the exposition of the nature of equilibrium within an industry by providing specific reference to the cyst calculations associated with the supply schedule.[84]

The representative firm bears some relationship to Max Weber's ideal or "pure type:"

> For the purposes of a typological scientific analysis it is convenient to treat all irrational, effectually determined elements of behaviour as factors of deviation from a conceptually pure type of rational action. . . . The construction of a purely rational |124| course of action in such cases serves the sociologist as a type. . . which has the merit of clear understandability and lack of ambiguity. By comparison with this it is possible to understand the ways in which actual action is influenced by irrational factors of all sorts, such as affects and errors, in that they account for the deviation from the line of conduct which would be expected on the hypothesis that the action were purely rational.[85]

The differences between Marshall's formulation and Weber's are apparent: Firms which are not representative are not necessarily guilty of irrational behavior; but for whatever reason, they may not show; in terms of size, profit rates, wage rates, form of organization, etc., the prevailing tendencies of the industry as a whole. Further, Weber's ideal type would have to be derived by the sort of historico-institutional and mathematical process suggested above. It would, therefore, have no empirical referent—

[84] Rogin, *op. cit.*, p. 257.

[85] Max Weber, *The Theory of Social and Economic Organization*, trans. A. M. Henderson and Talcott Parsons, (New York: Oxford University Press, 1947), p. 92.

a lack which Marshall would find intolerable. This insistence upon an empirical referent led Marshall into one serious difficulty which he freely acknowledged: In those situations where concentration had resulted in industry control by a small number of firms, there would be no representative firm. The only way to study the industry in this case would be to deal with each of the firms individually.[86]

Too much has been claimed for the representative firm on some occasions, and on other occasions it has been condemned for having |125| done too little. There is no more reason to force upon the representative firm, as Dennis Robertson did (*infra* p. 141), the task of reconciling the model of competitive equilibrium with the existence of diminishing returns than to denounce it for confusing the issue of general equilibrium, as Lionel Robbins did (*infra* p. 139). Its theoretical validity cannot be judged in the same fashion as the other Marshallian concepts, because it is largely expository. However, in all of Marshall's writings, his conclusions are nowhere effected by the validity of the representative firm concept.

We have now reached the heart of Marshall's theoretical analysis, the long run normal supply schedule. It is used as a *formal* method of describing cost trends appearing in any industry as a result of conditions governing the production of commodities. The long run is defined in terms of the same processes that occur in the working out of the tendencies towards increasing or decreasing returns and in a manner fully consistent with the treatment of the role of time in economic analysis.

This long run supply curve is *not* the supply curve of alternative price-quantity relationships of the post-Marshallian theorists. In this tradition, Viner's statement of the assumptions underlying the schedule of these relationships is that generally used in contemporary formulations of the price problem: |126|

> To simplify the analysis, it will be assumed that in each industry the optimum type of adjustment to a long-run variation in output for that industry as a whole will . . . be alike for all producers. . . . The theoretical static long-run, it should be

[86] *Principles*, p. 805.

> noted, is a sort of 'timeless' long-run throughout which nothing new happens except the full mutual adjustment to each other of the primary factors existing at the beginning of the long-run period. *It is more correct, therefore, to speak of long-run equilibrium in terms of the conditions which will prevail after a long-run rather than during a long-run* [italics mine].[87]

This position is essentially the same as that taken by Frank H. Knight who defines his supply curves in the context of what he calls the "static method." For Knight this method is one which

> . . . involves two fundamental but badly confused ideas. The first is simply that in describing any change it is assumed that "other things are equal." The second is that changes are described by stating the condition of affairs to which they would lead if they continued without interference until they equilibrated the forces at work and came to a natural end.[88]

Knight's definition thus comes to the same thing as Viner's.

In contrast, the Marshallian supply curve is perhaps best defined as the locus of price-quantity relationships describing the process which will occur in the course of a change in output in any given market situation, *sufficient time* (in an operational |127| sense) *being allowed at every point of the locus for the potentialities of diminishing or increasing returns to work themselves out*; the period relative to the long run supply curve must be of sufficient length for the disappearance of quasi-rents other than those which owe their existence to the permanent (relative to the length of the period) institutional or physical characteristics of the market. The alteration of the institutional or physical characteristics of the market or the introduction of major innovations would necessitate the construction of a new curve. This definition, it must be submitted, is the only definition consistent with Marshall's analysis of normal supply price, the principles of diminishing and increasing returns, and external and internal economies. More simply, the Marshallian supply curve may be looked upon as descriptive of the process occurring

[87] Jacob Viner, "Cost Curves and Supply Curves," *Zeitschrift Fuer Nationaloekonomie*, Band III, Heft 1, 1932, z. 29.

[88] Knight, "Cost of Production and Price Over Long and Short Periods," *op. cit.*, p. 188.

because of a change in output. It is a theoretical curve in the sense already discussed (*supra* pp. 104 ff.), and not a descriptive or an "historical" curve, for it will not be empirically observable, insofar as certain of the elements which would make for either cyclical or random variations have been impounded in *ceteris paribus*. It could by accident describe an historical situation if the action of the factors impounded were nugatory, but this would seldom be true particularly in the course of modern Western history. |128|

When Marshall discussed the supply curve with explicit attention to analytical detail, his definition is consistent with the one suggested here:

> Let us suppose a list of supply prices. . . The supply price of each amount of the commodity in a year, or any other unit of time, being written against that amount. As the flow, or (annual) amount of the commodity increases, the supply price may either increase or diminish; or it may even alternatively increase and diminish.[89]

Using this definition, Marshall then constructs a supply curve. However, to be consistent with the definition, each point along that supply curve would have to be dated, involving a cumbersome and not especially revealing procedure. However, in an appendix to the *Principles*, "Limitations of the Use of Statical Assumptions in Regard to Increasing Return," the problem is met directly:

> We should have made a great advance if we could represent the normal demand price and supply price as functions both of the amount normally produced and of the time at which that amount became norma1.[90]

The suggestion is then continued in a footnote:

> We could get much nearer to nature if we allowed ourselves a more complex illustration. We might take a series of curves, of which the first allowed for the economies likely to be introduced as a result of each increase in the scale of production during one year, |129| a second curve doing the same for two years, a third for three years and so on. Cutting them out of cardboard and standing them

[89] *Principles*, pp. 343-4.

[90] *Ibid*., p. 809.

> up side by side, we should obtain a surface of which the three dimensions represented amount, price, and time respectively. If we had marked on each curve the point corresponding to that amount which, so far as can be foreseen, seems likely to be the normal amount for the year to which the curve related, then these points would form a curve on the surface, and that curve would be a fairly true long-period normal supply curve for a commodity obeying the law of increasing return.[91]

Figure I has been drawn in accordance with Marshall's suggestions: s_os_o' represents the supply curve for a unit of operational time in which the plant is fixed; similarly s_1s_1', etc. "Year" in the above quotation has been interpreted as the period during which the plant is fixed, but the quantity of output is variable.[92] The curve SS' consisting of the locus of single points located on the ss' curves is the long run normal supply curve. |130|

It is assumed, as Marshall says, that these single points correspond with the normal amount which will be supplied for the "year."

Should there be any doubt that Marshall defined the supply curve as involving a process through time, that doubt is removed by Marshall's position that the long-run normal supply curve is irreversible. The reason for its irreversibility is that entrepreneurs and laborers learn, and having once learned it is unreasonable to suppose that they will forget their lessons simply because of a decrease in output. In the process of

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[91] *Principles*, pp. 809-810n.

[92] Marshall believed that it was inconsistent to draw a supply curve for the "market" period in which the quantity of output is not variable, because each point along the supply curve is supposed to measure the rate of output per unit of time; therefore, it must be looked at as a flow—whereas in the "market" period the quantity is given and as such represents a stock. In a letter to Edgeworth, Marshall remarked: "You know I never apply curves or mathematics to market values. For I don't think they help much. And market values are, I think either absolutely abstract or terribly concrete and full of ever-varying (though individually vital) side-issues. Also O_x for market values measures a stock and not a flow; and I found that, if I once got people to use Demand and Supply curves which discussed *stocks* along the axis of x, they could not easily be kept from introducing the notion of stock when flow was essential." *Memorials*, p. 435.

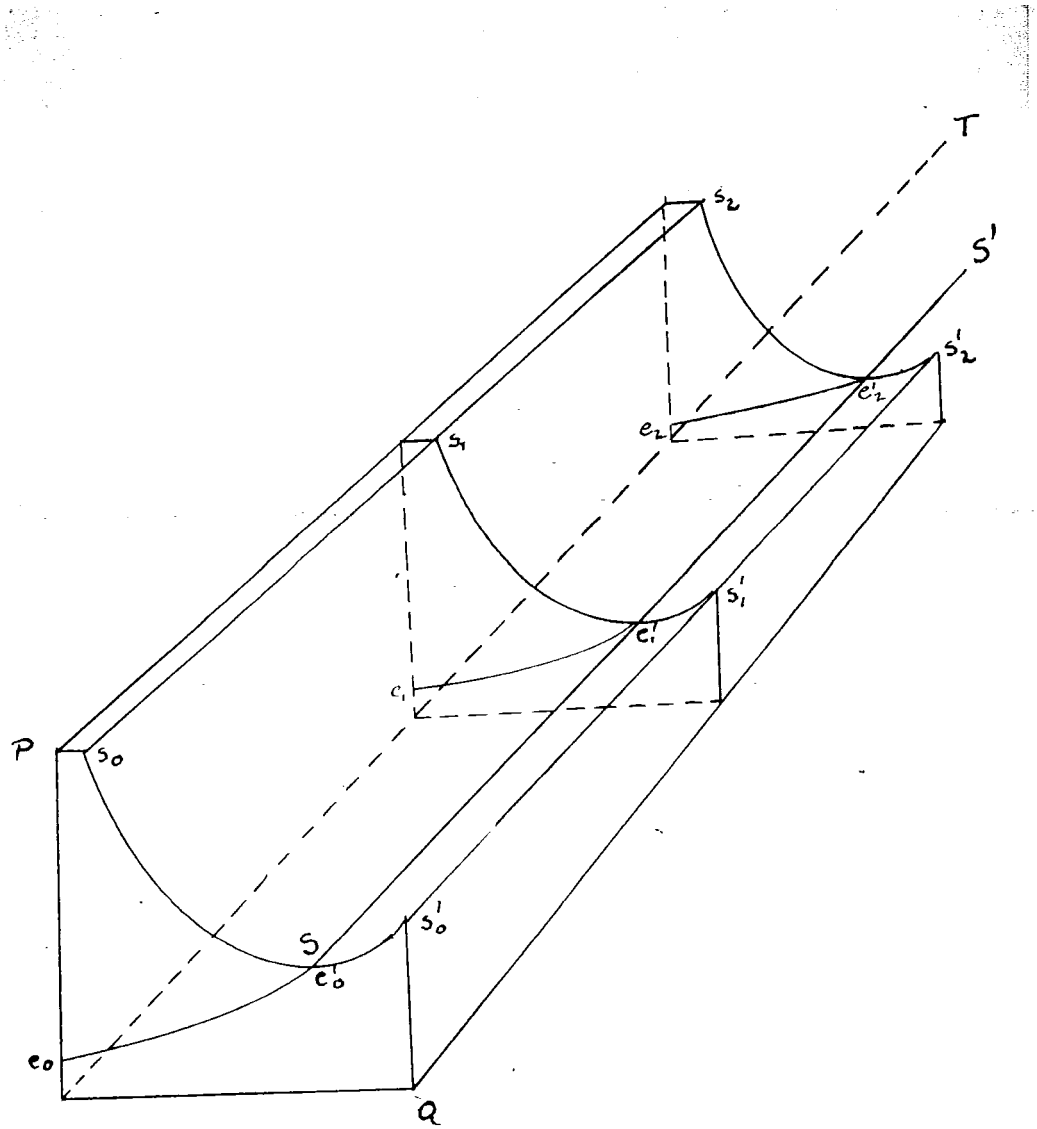

FIGURE I

expansion, given a length of time sufficient for the disappearance of quasi-rents (other than the permanent ones) changes are made, Marshall assumed, which are appropriate to the new level of output:

> . . . all investments of capital and effort in providing the material plans and the organization of a business, and in acquiring trade knowledge and specialized ability, have time to be adjusted to the incomes which are expected to be earned by them. . .[93]

To assume that the long run normal supply curve could be reversed if these elements were an integral part of each point of that long run supply curve would involve an abdication of responsibility to the facts in the field which Marshall would have found highly uncomfortable: |131|

> The list of supply prices which had held for the forward movement would not hold for the backward movement, but would have to be replaced by a lower schedule. . .
>
> For, when any casual disturbance has caused a great increase in the production of any commodity, and thereby has led to the introduction of extensive economies, these economies are not readily lost. Developments of mechanical appliances, of division of labour and of the means of transport, and improved organization of all kinds, when they have been once obtained are not readily abandoned.[94]

Concerning Figure I, there is no reason to believe that the normal supply would correspond with the minimum points of the set curves except in a competitive market, or failing competition, when the entrepreneur for reasons other than those connected with maximizing his profit decides to fix price and output at a level which would prevail in a competitive market.[95] Thus a degree of monopoly control in the market, in the absence of other ameliorative factors, would result in the SS' curve lying to the left of the minimum points of the ss' curves.

A somewhat different picture of the configuration of these Marshallian theoretical devices might be obtained by defining the long run normal supply curve, after Dennis

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[93] *Principles*, p. 377.

[94] *Ibid*., p. 808.

[95] E.g., reasons connected with an exercise of economic chivalry; cf., Chapter IV, *infra*.

Robertson, as the locus of the end points of a family of particular expenses curves, each representing the conditions in the industry for any given level of |132| output.[96] The particular expenses curve represents an array of quantities of output by firm (O_x) from lowest to highest cost (O_y). It will, during any period, represent the cost of production of the various firms within an industry in ascending order of magnitude on the assumption that all of the firms within the industry do not have equal access to the external and internal economies or diseconomies of production.[97] Insofar as changes in organization and acquisition of trade knowledge, etc., are included in the definition of the supply curve, the particular expenses curve would have a different shape for each point of the long run normal cost curve. It is, as Marshall warned, based on the assumption of a given aggregate level of output represented by its end point where it is equal to the supply curve and as such ". . . represent[s] a particular phase of any industry. . . but. . . cannot be taken to represent its general conditions of production."[98] These "general conditions" are represented by the supply curve. However, a shift in the relative access of individual firms to the economies of production would be indicated by the successive changes in shape (Figure I) of e_0e_0', e_1e_1', etc., where ee' represents the particular expenses curve. |133|

It should by now be apparent that Marshall's central theoretical analysis was designed to deal with questions of market development on a level of high abstraction. The problem which called forth the greatest measure of his analytical power was the effect on the price quantity relationships and even more important upon market organization of increases in production.

Many of the theoretical problems dealt with in this chapter became subject matter for one of the more famous controversies in Economics which lasted throughout the 1920's and into the next decade. Most of the discussion appeared in the *Economic Journal*. The

[96] Dennis H. Robertson, "Those Empty Economic Boxes," *Economic Journal*, Vol. XXXIV, January 1924, p. 25.

[97] *Principles*, pp. 810-11n.

[98] *Idem*.

issues raised were far-ranging and many of them do not concern this study; but one of the principal themes had to do with the compatibility of increasing returns with competitive market equilibrium; and so much of Marshall's analysis turns on this point that a discussion of some of the problems raised would be appropriate.

In 1922, in an issue of the *Economic Journal* containing a touching tribute to Marshall signed by many of the leading economists of the Western World honoring him on his eightieth birthday, J. H. Clapham published his comments "On Empty Economic Boxes."[99] Clapham felt it was impossible to find empirical data to fill those boxes. The boxes whose apparent emptiness concerned him the most were those labeled Diminishing Return Industries, Constant Return Industries and Increasing Return Industries. His analysis resulted in one |134| conclusion and two opinions: First, he felt, it is doubtful that by statistical or historical research it would ever be possible to use the categories of returns in dealing with the actual market data. Second, he thought it questionable whether such a treatment could be useful for any operational purpose. And third, in all events, he felt that no good purpose would be served when analytical work outruns even the possibility of empirical verification.[100]

But, as we have seen, Marshall did not expect an *exact* conformity between his theoretical "boxes" and the empirical data. They must bear a responsibility to the data in the sense that the effect of those data not directly reflected in the theoretical formulation would not be such as to vitiate the conclusions drawn from the formulation. And as for the purpose served by the boxes—the subsequent discussion revealed so many that Clapham's original objections were immediately lost sight of. Pigou in his reply to Clapham came directly to the methodological issue involved:

> To take the categories of increasing and diminishing return out of their setting and to speak of them as though they were a thing that could be swept away without injury to the whole *corpus* of economics is a very perverse proceeding. It would be

[99] J. H. Clapham, "On Empty Economic Boxes," *Economic Journal*, Vol. XXXII, September 1922, p. 305.

[100] *Ibid*., p. 312.

> easy enough to drop the names; but does anybody seriously imagine that we could have any understanding at all of the influences governing economic values if the *fact* that aggregate output and supply cost have varying relations to one another were ignored?[101] |135|

Thus these boxes constitute the ". . . intellectual machinery by which the main part of modern economic thought functions."[102] Pigou, in suggesting a practical use for the boxes in answer to Clapham's question, advanced his proposal for the subsidization of industries enjoying increasing returns.[103]

It was this suggestion of Pigou that led Robertson to the issue of whether increasing returns were necessarily associated with monopolistic market results:

> But I see no reason at all to infer from this state of affairs that production in such industries is being carried further than the social interest dictates. The land itself, and other factors employed with it, are presumably each being employed up to, but not beyond, the point at which any further application would be less advantageous to the individuals concerned than application in some other field; and I see no cause for suspecting in this matter any but special and incidental disharmonies, of varying and indefinite magnitudes, between the interests of the individual and of society.[104]

Robertson was perhaps led to this position (which he later sharply modified) because, in not looking at the conditions of supply as a process through time, he fell into the error of thinking that a stable equilibrium under conditions of increasing returns could be obtained.

But shortly after Robertson's article, Piero Sraffa in an interesting anticipation of the "Chamberlinian Revolution" |136| suggested that it was possible to salvage stability for the economic system when faced with conditions of increasing returns; but the cost of the salvage operation was the recognition of a degree of monopoly throughout the economy:

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[101] A. C. Pigou, "Empty Economic Boxes: A Reply," *Economic Journal*, Vol. XXXII, December 1922, p. 461.

[102] *Idem*.

[103] *lbid*., pp. 462-463; also cf. *Principles,* pp. 468 ff.

[104] Robertson, *op. cit*., p. 27.

> . . . we are led to ascribe the correct measure of importance to the chief obstacle which hinders the free play of competition, even where this appears to predominate, and which at the same time renders a stable equilibrium possible even when the supply curve for the products of each individual firm is descending—that is, the absence of indifference on the part of the buyers of goods as between the different producers.[105]

Sraffa also suggested that increasing returns might be consistent with competitive equilibrium if they were due to external economies. But he decided that this was not an important possibility because external economies would occur only with large changes in output, and their effect would be felt only over very long periods.[106] Sraffa's conclusion is an example of the difficulties that can arise as a result of dealing with a concept adapted to the analysis of process which Marshall had developed, as though it were the equivalent of the static definition of the cost relationships.

Shortly after this discussion, Pigou confirmed the view that a stable equilibrium was impossible where the cost of production |137| was falling except when the fall was due to economies external to the firm.[107] He implicitly rejected Sraffa's contention that external economies could not be treated as relevant to long run normal price.

By this time, the various positions were reasonably well defined: Sraffa's important suggestions were fated to go begging for almost another decade; the subtleties of Marshall's treatment of the problem as a process over time were overlooked and the question of the usefulness of the Marshallian concepts was being decided *vis-a-vis* the timeless model of the post-Marshallian writers. However, with only a minority dissent, the role of external and internal economies in the determination of equilibrium had been decided upon, though their usefulness was questioned.

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[105] P. Sraffa, "Laws of Returns Under Competitive Conditions," *Economic Journal*, Vol. XXXVI, December 1926, p. 544. The proposition is clearly stated in *Principles*, p. 458n., in terms of differences in slope between the industry and firm demand curves.

[106] *Ibid*., pp. 540 f.

[107] A. C. Pigou, "An Analysis of Supply," *Economic Journal*, Vol. XXXVIII, June 1928, p. 239.

Up to this time, the representative firm had been lurking in the background. It had been clear to all concerned that the discussion of returns had to be qualified by the existence of varying cost-price relationships among firms constituting the industry; economists as a whole were not yet willing to make the heroic assumption that all of the firms within an industry possessed the same sets of cost-price relationships. In fact, Pigou had suggested that the industry should be considered in terms of an equilibrium firm similar to the representative firm.[108] But Lionel |138| Robbins was not content to let Marshall's representative firm slip by unscathed:

> *There is no more need for us to assume a representative firm or a representative producer, than there is for us to assume a representative piece of land, a representative worker.*[109]

Robbins further suggested that there were no problems either in particular or in general equilibrium analysis that needed the representative firm for a determinate solution. This is correct if we concede that the only kind of particular equilibrium or general equilibrium analysis worth discussing is one which abstracts from the richness of detail that Marshall was wont to integrate into his central model and for which he had devised the two related concepts, the representative firm and the particular expenses curve. Thus, Robbins primary objection to the representative firm reduces to a literary criticism of Marshall's expository style, though he does not seem to have appreciated this fact.

Allyn Young in his Presidential Address to Section F, to which we have already alluded (*supra* p. 115), emphasized that the proper analytical framework should provide for the analysis of the historical process of industry development which had been at an astonishingly |139| rapid rate in recent times. This historical development, he thought, must be looked upon as external to the firm; and as such it is consistent with the

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[108] *Idem*.

[109] Lionel Robbins, "The Representative Firm," *Economic Journal*, Vol. XXXVIII, September 1928, p. 393. Marshall was perfectly aware of the fact that the concept was not too useful in other situations although he felt it might be valid on a purely logical level for, say, an analysis of wages. Cf. *Memorials*, p. 435.

continuation of competition.[110] In this matter, he agreed with the position already taken by Sraffa. Schumpeter, like Allyn Young, emphasized the historical nature of the process in developing his own theory of economic change; but Schumpeter questioned the usefulness of long run cost analysis: He suggested that the process be dealt with by utilizing sets of shifting short run cost curves.[111]

In March, 1930, after several more skirmishes a Symposium on this series of ideas which had been under discussion took place.[112] To begin with, Robertson defended the use of the representative firm especially as a device in understanding the theory of increasing return ". . . if we can bring ourselves to regard it as being at any moment not merely a sort of ghostly epitome of conflicting tendencies, but also in some sense a type or mode."[113] Then in an exhibition of |140| literary skill that has come to be expected from him, Robertson concluded that, even with the existence of increasing returns for firms within the industry it is possible that a state of competitive equilibrium will obtain:

> On my view, it is not necessary to suppose that under increasing returns the average cost curve of the Representative Firm must alter its position or its shape . . . as the output of the whole industry alters, or to regard it as anything other than a small-scale replica of the supply curve of the industry as a whole. All that is necessary is to be on one's guard against identifying it with the cost curve of any firm whose name is to be found in the directory. I am quite aware that the position cannot be cleared up mathematically: so was Marshall, and issued stringent injunctions against making the attempt. . . . But I think it throws an ampler flood of

[110] Young, *op. cit.*, p. 527.

[111] Joseph A. Schumpeter, "The Instability of Capitalism," *Economic Journal*, Vol. XXXVIII, September 1928, pp. 368 ff. Marshall grants that it is possible to look at this situation in terms of a series of supply curves, each one having a minimum point lower than the preceding one. But the importance of the temporal considerations led him to prefer the sort of representation discussed in this study. Cf. *Principles*, p. 463n.

[112] D. H. Robertson, G. F. Shove, and P. Sraffa, "Increasing Return and the Representative Firm: A Symposium," *Economic Journal*, Vol. XL, March 1930, pp. 78 ff. Contains a complete bibliography.

[113] *Ibid.*, p. 83. It had evidently been forgotten that Marshall looked upon the Representative Firm as one actually existing.

> light on the turmoil of what happens in real life than recourse to the notion that the baby's bones grow as the result of a growth in its skeleton.[114]

It is easy to agree with Sraffa that Robertson's use of the representative firm to demonstrate the compatibility of competitive equilibrium with the existence of increasing return is clouded with more than a little literary obscurantism. Essentially Sraffa's position is that while no one can deny the existence of increasing returns in the "real world," those increasing returns should be looked upon as the mechanism by which equilibrium would be restored.[115] The position would have been acceptable only if Sraffa had limited |141| his conclusions to short run considerations, thus implying a long run treatment similar to that suggested by Schumpeter.

Shove, who had the last word in the Symposium, argued that the representative firm was suitable for some purposes but not for others:

> The representative firm is an appropriate and indeed brilliant device for displaying these facts when we want to depict equilibrium as resulting from the rise and fall of individual houses of business; but, when, as in the present paper, we look at it as arising from the ebb and flow of resources of all kinds from one occupation to another, a different method of allowing for the same facts is called for.[116]

Shove then argued that if the assumption is made that there is an optimum number of firms within an industry and if we take as given "*. . . the degree of knowledge and intelligence prevailing among the persons engaged in the industry. . .*" then it is not difficult to work out the arrangement of the factors of production as a set of simultaneous equations, based on the relationship between the earning capacities of resources employed relative to some initial distribution of those resources.[117] But this is not the problem of either Marshall or Robertson. Their problem had to do with the long run effects for market organization of the continued existence of increasing return. |142|

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[114] *Ibid*., p. 89.

[115] *Ibid*., p. 94.

[116] *Ibid*., p. 96.

[117] *Ibid*., pp. 97 ff.

Shove continued to a number of points which may best be summarized as they affect our position as follows: First, external economies do not lead to the tendency towards concentration. In this conclusion, Shove agreed with almost everyone else, except that he preferred definition of external economies which need not concern us here. Second, in those cases where internal economies result in an enlargement of the market, there will still be no tendency towards concentration because the firms within an industry will take advantage of those tendencies so as to maintain their relative size intact. Shove here overlooked the, lesson of Marshall's particular expenses analysis: There is no reason to expect that all of the firms in an industry will have equal access to economies and diseconomies of production; there is, in fact, every reason to expect the contrary. Nor is it clear that even if industry output were stable in the face of increasing returns that the market would operate so as to maintain relative positions intact except on the untenable assumption of equal access. And third, Shove concluded that the diseconomies of expansion will probably outweigh in most instances the economies of expansion. It can only be observed with respect to this last conclusion that if it were true, the entire discussion is jejune.[118]

Several conclusions may be drawn from the *Economic Journal* controversy as it relates to the analysis of this chapter. First, most of the Marshallian theoretical devices are to be looked upon |143| not as being ultimately valid in any sense; that is, care must be taken to avoid the fallacy of misplaced concreteness; or, in the language of the pragmatists, we must avoid the hypostatization of Marshall's theoretical formulation. Especially, it must not be judged in abstraction from the concept of process through time, which Marshall derived from his beliefs as to the ultimate nature of his physical environment.

Second, the possibility of a competitive equilibrium depends on whether the expansion of the relative size of the firm, even to the point where such expansion results in a degree of monopolistic control of the market, can come about as a result of business

[118] *Ibid*., pp. 109 ff.

decisions made within the firm. If decisions of this kind are the principal cause for expansion (and agreement on this point is fairly general), competitive equilibrium cannot be maintained.

Third, it would be necessary in any event to examine the available historical and statistical evidence to determine whether internal economies or external economies are likely to predominate. If Clapham's remarks, which started the controversy, had any meaning, they are to be found in this.

Fourth, on a somewhat different level, a further conclusion may be drawn: The abandonment of Marshall's analysis of temporal process would inevitably lead to the most difficult obscurities. Thus Schumpeter's dissatisfaction with the long run analysis of the classical tradition resulted in a proposal which would in effect |144| abandon long run analysis altogether. These difficulties in interpreting the external economies doctrine were caused largely by a failure to observe consistency in dealing with the time problem.

In the next chapter, we shall examine Marshall's analysis of the organization of industry and its development. It was this analysis which led him to believe that, with certain important modifications, the role played by internal economies is of greater importance than the role played by external economies; and hence to a tendency towards increasing concentration of ownership and control of industry. We shall also examine Marshall's conclusions as to the social implications of this conclusion, for it was those social implications that concerned him far more than the technological issues involved in increasing concentration. |145|