RICARDO'S SECOND THOUGHTS ON RENT AS A RELATIVE SHARE[1]

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The derivation of a theory of relative shares was one of Ricardo's major goals. He definitely presented it as such in the celebrated preface to the *Principles*, saying:

> The produce of the earth . . . is divided among three classes of the community. . . . But in different stages of society, the *proportions* of the whole produce of the earth which will be allotted to each of these classes under the names of rent, profit and wages, will be essentially different; . . . . To determine the laws which regulate this distribution, is the principal problem in Political economy.[2]

An attempt to follow this line of enquiry was made in the first chapters of the book where the essential features of the Ricardian model were put together. An outline of a theory of relative shares—wages, profit and rent—applicable to the contemporaneous social structure of England was then offered. According to this theory, rent in absolute terms and as a share of social income, was said to follow a rising trend in a growing economy. This result had a major significance intellectually and carried a specific message for the politics of the age.

Yet in a consecutive series of notes (Notes 106, and 110–116) in his *Notes to Malthus*, Ricardo sought to "clarify" his previous dicta on rent by making statements which do not tally with the results arising out of the Principles Model.[3, 4] In some of the notes in this running commentary on Malthus' statements he maintains that his theorem on rent as a rising share of income does not necessarily apply to social product as a whole. He suggests that a falling share is also consistent with the structure of his model. Consequently he denies the impression, which Malthus among others had entertained, that both his explicit dicta and the tenor of his argument in the *Principles*, and elsewhere, imply that rent is necessarily a rising relative share of a growing social product.

The purpose of this paper is to pass under review Ricardo's various dicta on the subject and to reexamine the argument leading up to them. We first set out the statements from the *Principles* and the *Notes* bearing on this issue. We then derive Ricardo's *Principles* theorem on the trend of the relative share of rent and outline the properties of the models from which it was deduced. We then present the proposition on the trend of the relative share of rent, as set out in the *Notes*, which is inconsistent with that of the *Principles*. It is shown, however, that this is due to the fact that in the *Notes* Ricardo was, without realizing it, arguing on the basis of a different set of premises.

THE REFERENCES

The following series of references taken from the *Principles* and the *Notes on Malthus* include, to the best of my knowledge, the most relevant statements bear-

[1] The author is indebted to M. Blaug for useful comments on an early draft.

[2] D. Ricardo, *Principles of Political Economy and Taxation* in *The Works and Correspondence of David Ricardo*, P. Sraffa, ed. (Cambridge University Press, 1951), Vol. I, p. 5.

References hereafter to Ricardo's writings will be to the Sraffa edition.

[3] These notes were composed between August and November 1820, while preparing the third and definitive edition of the *Principles*. See Mr. Sraffa's introduction to the *Notes* in D. Ricardo, *Works*, Vol. II, pp. XI–XII.

[4] My interest in Ricardo's statements on relative shares in the *Notes* is due to Professor Stigler who referred me to some of them in a private communication.

ing on the subject. They have been drawn up in two columns, the left hand one for the extracts from the *Principles* and the right hand one for the passages from the *Notes*, so as to bring out the contrast between the two series.

Principles

A. It is according to the division of the whole produce of the land and labour of the country [of any particular farm. . . . 3rd ed.] between the three classes of landlord, capitalist and labourer, that we are to judge of the rise or fall of rent, profit, and wages and not according to the value at which that produce may be estimated in a medium which is confessedly variable. (*Works*, Vol. I, p. 49).

B. In speaking of the rent of the landlord, we have rather considered it as the *proportion* of the whole produce [of the produce obtained with a given capital on a given farm. . . . 3rd ed.] without any reference to its exchangeable value: but since the same cause, the difficulty of production, raises the exchangeable value of raw produce, and raises also the *proportion* of raw produce paid to the landlord for rent, it is obvious that the landlord is doubly benefited by difficulty of production. First he obtains a *greater share*, and secondly the commodity in which he is paid is of greater value. (*Works*, Vol. I, p. 83).

C. But there is this essential difference between the rise of rent and the rise of wages. The rise in the money value of rent is accompanied by an increased *share* of its produce; not only is the landlord's money rent greater but his corn rent also. . . . The fate of the labourer will be less happy, he will receive more money wages it is true, but his corn wages will be reduced . . . his general condition will be deteriorated by his finding it more difficult to maintain the market rate of wages above their natural rate. (*Works*, Vol. I, p. 102).

D. We have shown that in early stages of society, both the landlord's and the labourer's share of the value of the produce of the earth, would be but small; and that it would increase in proportion to the progress of wealth, and the difficulty of procuring food. We have shown too, that although the value of the labourer's portion will be increased by the high value of food, his real share will be diminished; whilst that of the landlord will not only be raised in value, but will also be increased in quantity.

The remaining quantity of the produce of the land, after the landlord and labourer are paid, necessarily belongs to the farmer and constitutes the profits of his stock. But it may be alleged, that though as society advances, his

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F. It is very probable that my language about proportions may not have been so clear as it ought to have been. I will endeavor now to explain it.

. . . . If this year the labourer shall have one third of the 180 quarters, and next year he shall have one third of the 170 quarters, I say his wages will be of the same value next year, as this, because the whole 170 quarters next year will be of the same value as the 180 quarters are this year and consequently ½, a fourth, or a third of either of these quantities, will be also of the same value.

When I speak of *this* division by proportions, I always apply it, or ought to apply it (and if I have done otherwise, it has been from inadvertance), to the produce obtained with the last capital obtained on the land, and for which no rent is paid. . . .

. . . . Mr. Malthus says "Improvements in agriculture tend even according to the concessions of Mr. Ricardo to increase the proportion of the whole produce which falls to the landlord's share." I do not know where I have said this, but I wish to correct the passage if I have fallen into this error by substituting the word used by Mr. Malthus, "portion" for proportion, or if the word proportion be retained, it must be the proportion of the produce obtained on the more fertile lands. (*Works*, Vol. II, Note (115), pp. 196–7).

G. If therefore I have anywhere said that rent rises or falls in the proportion that the produce obtained is increased or diminished I have committed an error. I am not however conscious of having so done (*Works*, Vol. II, pp. 196–7, note (115) f.n.1).

H. . . .I have a farm from which I obtain 360 qrs. of corn, and I pay one fourth for rent, or 90 qrs. By employing more capital on inferior land, instead of 360 qrs. being obtained with the same quantity of labour, only 340 can be got, and therefore the rent of the land on which 360 were obtained, would rise from 90 to 110 qrs.; the rent on that particular farm would be a greater proportion of the gross produce than before, but it by no means *follows that it would be a greater proportion of the whole produce of the country;* for instead of one capi-

Principles

proportion of the *whole* produce will be diminished, yet as it will rise in value, he, as well as the landlord and labourer, may, notwithstanding receive a greater value. (*Works*, Vol. I, p. 112).

E. When no other but the most fertile land is in cultivation, the landlord has the smallest share (proportion. . . . 3rd ed.) of the whole produce. . . . It is only when inferior lands are required to feed an augmenting population, that both the landlord's share of the *whole produce*, and the value he receives, progressively increase. (*Works*, Vol. I, pp. 402–403).

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tal being employed to obtain 340 qrs. one hundred equal capitals may be so employed. It is possible then that the gross produce may be increased 34,000 quarters and rent rise only 20 qrs. Because the landlord had one fourth of the gross produce, and has *increased that proportion on all lands before cultivated*, does it follow that I am bound to maintain that rents are also a larger proportion of the whole gross produce from all the lands in the country? (*Works*, Vol. II, p. 193, note 113).

I. I think the landlords relative condition to the capitalists will gradually improve with the progress of a country, although his rent will certainly not increase in the *proportion* of the gross produce. (*Works*, Vol. II, note 106, p. 183).

THE RELATIVE SHARE OF RENT—THE *PRINCIPLES* PROPOSITION

Consider first Ricardo's theory of relative shares as put across in the *Principles*. Our interpretation of the references in the series *A–E*, above, is based on his original formulation in the first and second editions of the book. The significance of the interpolation of one phrase into passages A and B made in the third edition (and reproduced in brackets) will be discussed later.[5]

It is quite evident that in every passage but the first, in the series *A–E* taken from the *Principles*, Ricardo consistently restates the same proposition. *Rent is a rising relative share of social product.*

That statement is first made in passage *B*, which consists of the concluding paragraph of the chapter "On Rent." It is restated in *C*, which is from the chapter "On Wages," and is hence naturally put there in apposition to a proposition on the trend of the latter variable. Passages *D* and *E* from the chapter "On Profit" and from a polemical chapter "Mr. Malthus' Opinions on Rent," correspondingly, carry statements to the same effect.

Some of these passages do refer to "the landlord," "the capitalist" and "the labourer," in the singular instead of to the respective aggregates. This however is due to Ricardo's technique of reasoning, and hence does not restrict the validity of the propositions. It seems however preferable not to leave it at that but to trace carefully the implicit assumptions and the explicit line of reasoning by which Ricardo sought to establish his theorem on the pattern of the relative share of rent.

The key passage pertaining to this subject is evidently passage *D* which contains a comprehensive statement on relative shares, presumably the most complete in Ricardo's writings. It consists in effect of a resume of the propositions on profit, rent and wages. Its second paragraph treats profit as a relative share of social income. This is both stated explicitly in the last sentence of the paragraph and implied by the context of the preceding sentence. The term *proportion* is admittedly not made use of in the wording of the first paragraph of the passage which refers to the relative shares of *wages* and of *rent*. Yet symmetry and the wording of the second paragraph certainly imply that the phrase "real share" in this paragraph has an analogous significance to the term "proportion" used in the case of profit. The theory of distribution set out in *D* suggests, accordingly, that the share of rent *rises* and that of wages and profit falls.

The argument is supported by a numeri-

[5] See below, p. 291.

TABLE I

(1) Input in doses	(2) Marginal product in q. of wheat	(3) Rent (from product of one dose) in q.	(4) Total (product of one dose) in q.	(5) Price			(6) Rent			(7) Total		
				£	s.	d.	£	s.	d.	£	s.	d.
10	180	None		4	0	0		None		720	0	0
20	170	10		4	4	8	47	7	6	762	7	6
30	160	20	180	4	10	0	90	0	0	810	0	0
40	150	30		4	16	0	144	0	0	864	0	0
50	140	40		5	2	10	205	13	4	925	13	4

cal example which is supposed to illustrate how "the 180 quarters of corn would be divided between *landlords*, *farmers* and *labourers* with variation in the value of corn," and also how "under the same circumstances money, rent, wages and profit would be divided."

Ricardo put the data for the relative share of rent in real and money terms into two tables the heading and the content of which leave no doubt that their purpose is to convey a proposition on relative shares. Despite the specific numerical set-up of this illustration, Ricardo cleary attributes the result to the *economic system as a whole.* It is an outline of the division of product between *"landlords, farmers* and *labourers,"* in the plural, as he put it.

By using the relevant columns of Ricardo's two tables, and two columns from a footnote to the chapter "On Rent," we obtain Table I.[6]

An inference from a numerical example which illustrates the pattern of the distributional shares of the product of a single dose only, for a proposition that applies to social product, seems certainly wanting. The same data imply, however, that the share of rent in the product of n doses—i.e., in total product—also rises. This could easily be shown by deriving a corresponding total product schedule from the given marginal product schedule, and by calculating rent as the difference between the entries for total product and the corresponding entries for the rewards to labour and capital. The latter are the entries in the marginal product column multiplied by the respective number of doses.[7]

Ricardo admittedly applied a somewhat different line of reasoning to derive this result. He argued that since the relative share of rent in the product of the first dose has been shown to rise in response to the employment of subsequent input doses, this holds generally for its relative share in the product of any of the penultimate doses. Hence, since total product is the sum of the respective product of the employed doses the proposition applies to the relative share in total product.

This line of reasoning, which displays Ricardo's conventional technique is clearly formulated in a deleted note to Malthus' *Principles.*[8] It is also in essence the method

[6] The entries in columns 1 and 2 are from the footnote to the chapter "On Rent" (*Principles,* p. 82). The entries in the other columns are from two tables in the footnote to the chapter "On Profits" (*ibid.,* p. 116). Column heading except for columns (1) and (2) are Ricardo's own.

The price schedule is derived by postulating a constant value of the monetary unit in terms of labour. Diminishing returns in wheat production imply consequently a rise in the price of wheat.

[7] The total product column corresponding to columns (1) and (2) would be 180, 350, 510, etc., and the corresponding rent column would be 10, 30, 60, etc. This evidently yields a rising rent product ratio. The same holds a fortiori for the ratio of money rent to the (money) value of total product.

[8] "Suppose I employ 3 equal quantities of capital successively on the same land as prices rise. I say when the second quantity is applied, the proportion paid to the landlord of the *quantity* obtained by the first will be increased—he will have no portion whatever of the second. When the third

whereby he constructed his well-known "Table Showing the Progress of Rent and Profit Under an Assumed Augmentation of Capital" in the *Essay on Profits*. Having obtained the entries for rent corresponding to the number of input units, he proceeded to relate total rent to total capital. This peculiar ratio of rent to capital was shown to rise, thus proving the point which he was out to make—that with the "progress" of an economy, "The landlord not only obtains a greater produce, but a larger share." This result, which Ricardo read from his rent over capital column, could have been easily obtained from the numerical data of the same table for the more conventional relation—rent as a rising share of social product.[9]

A SKETCH OF THE *PRINCIPLES* MACRO MODEL

A short outline of the model and reasoning which led up to this proposition, and which were central to so much else of the Ricardian system, may be appropriate.

The basis of Ricardo's structure is the notion of dependence of output on factor inputs and the specific nature of this relation. The input levels of the variable factors, capital and labour, operating on the fixed factor, land, within a framework given by a natural datum, fertility, and by technology, determine the size of output. It is a diminishing returns production function which is attributed to the "farm," the micro economic unit of Ricardian economics.[10]

The next and crucial step in the argument was to attribute this property to the aggregate production function. This was done on many an occasion by simply identifying the micro and the macro planes —the "farm" with the economy. The diminishing returns property of the aggregate production function could be deduced by an aggregation procedure similar in nature to the one implicitly adopted for the multifield "farm." The macro economic production function is simply aggregated from the functions of the individual farms. However, an additional restriction had to be imposed if the aggregate production function was to be endowed with the diminishing returns property of the micro economic functions. One had to assume that at any level of input, the $(n + 1)^{\text{th}}$ unit of capital and labour, whether employed at the extensive or intensive margin (at the marginal or at any of the intramarginal farms) would yield a lower return than the n^{th} unit.

The next step in the theory of relative shares is the observation that land is a datum for the system as a whole, while population growth and capital accumulation raise the capital-labour to land ratio. Rent is therefore a residual share after the payment to the variable factors, capital and labour, the joint rate of remuneration which is determined by their product at the margin. Their total share is simply a product of their marginal product and the number of doses of capital and labour applied.

This construction and a *linear* marginal product curve, which Ricardo implicitly assumes in his numerical examples, definitely imply the proposition that rent is a rising relative share of social income.[11]

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quantity of capital is applied he will get a still larger proportion of the quantity obtained by the first capital, a small proportion of the quantity obtained by the second, and no portion of the third." See D. Ricardo, *Works,* Vol. II,

[9] The entries in the corresponding "product" column which Ricardo did not explicitly present in his table are simply the sum of the respective entries in two columns which he did present: the "cost of production" column, and the "total produce after paying the cost of production" column.

[10] Since land within a given farm is not necessarily homogeneous, the diminishing returns property of the "farm's" production function assumes not only that returns on all of its "fields" diminish. It implies that this property holds also along the optimal path of factor allocation defined by the extensive and intensive margins, respectively, at each level of variable input.

[11] For a formal outline of this macro economic

TABLE II

Input*	Farm No. (1) Marginal** Product	(2) Marginal Product	(3) Marginal Product	(4–99) Marginal Product	(100) Marginal Product	The Economy Marginal Product
1	360	340	340	340	340	360
2	340	320	320	320	320	340
3	320	300	300	300	300	340
4	300	280	280	280	280	340
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
18	20	0	0	0	0	.
19	0					340
.						.
.						.
.						.
.						.
101						340

* In doses of capital and labour.
** In quarters of wheat.

THE RELATIVE SHARE OF RENT—THE *NOTES* PROPOSITION

The proposition on the trend of the share of rent which Ricardo sought to establish in the *Notes* does not square with that of the *Principles.* His groping towards a different position on this issue is forcefully put across in *Note 113* (passage *H*, above), and supported by similar statements in the last paragraph of *Note 115* and *Note 106* (passages *F* and *I*). He puts his case in terms of a query:

> By employing more capital on inferior land ... the rent on that particular farm would be a greater proportion of gross produce than before, but it by *no means follows* that it would be a *greater proportion of the whole produce of the country.*

Ricardo makes use of a numerical illustration which assumes the "conventional" linear diminishing marginal product curve of the 360-340 variety, for the individual farm, to sustain the argument. He adds, however, another strategic, but implicit, assumption by postulating that within a certain and relevant range of inputs, the marginal product curves of the individual farms are *identical.* This feature of his numerical construct, and the corresponding "optimal" marginal product schedule for the economy as a whole, are shown in the returns schedule in Table II.[12]

The entries in the economy's returns schedule shown in the last column of the table indicate that the optimal aggregate production function, does not display diminishing returns within the range of 2–101 units of input. This is due to the fact, to which we have already referred above, that diminishing returns at the plane of the

model, see my "Ricardo on Factor Prices and Income Distribution in a Growing Economy," *Economica,* 1959, pp. 240–242. For a discussion of the nature of the aggregate production function, and the corresponding proposition on rent as a relative share, implied by the assumed linearity of the diminishing returns curve, see *ibid,* pp. 245–246.

[12] The identical "diminishing returns" production schedules for the individual farms, in all the columns but the last represent the data schedule presented in *Note 113* (passage *H* in the series above). The economy schedule in the last column is the corresponding aggregated optimal production schedule.

individual farm do not necessarily imply an aggregate production function which features the same property along its entire range. In particular, an assumption of *identical* marginal product curves for the various farms, which Ricardo latently made in *Note 113*, definitely implies that in some ranges of the aggregate production function returns do not diminish. This is due to the fact that the optimal allocation of variable factors at the macro economic plane requires, under the specified conditions, the application of additional input units at the *extensive* margin, within a range defined at each relevant step by the number of farms which make up the economy.[13]

Given an aggregate production function in certain ranges of which returns are not diminishing, and a restriction on the size of input which keeps the economy within such a range, Ricardo's statement at the end of *Note 113* is warranted.

> Because the landlord ... has increased that proportion [of gross product] on all land before cultivated does it follow that I am bound to maintain that rents are also a larger proportion of the whole gross produce from all lands in the country.

If these conditions obtain, rent is definitely a *falling* and not a rising relative share even though returns are (linearily) diminishing at the *farm* level.

However this result had been bought at a price which Ricardo himself may have presumably considered to be excessive. His position in *Note 113* is evidently tantamount to the renunciation of diminishing returns as a property of the aggregate production function.

THE *NOTES* PROPOSITION AND THE CHARACTERISTICS OF THE RICARDIAN SYSTEM

We have just seen that in some places in the *Notes on Malthus* Ricardo had been using a different set of premises than those underpinning the theoretical structure of the *Principles*. The diminishing returns macro economic model of the latter gave way accordingly to an alternative model which does not feature this property in the relevant section of its production function. Whatever the case that can be made for one or for the other of these models, neither could be used to invalidate results deduced from the other. Ricardo's statements in the last sentence of *Note 113*, in the last paragraph of *Note 115* and in *Note 106* (passages *H* and *F*, and *I* respectively, above) amount, nevertheless, to just that.

The *Notes* position on rent as a relative share is undoubtedly consistent within the framework of a model which excludes the essential attribute of Ricardo's model-diminishing returns. Thus if Ricardo had meant to make a complete break with his original theoretical structure, one could not take exception to his claim that these numerical data and his model do not imply that rent is a rising relative share.

He was, however, reluctant to make such a complete *volte face*. That this is so is at once evident from the nature of his attempts to bring into line some, though by no means all, of his original statements on rent as a relative share, by means of minor deletions and the insertion of qualifying phrases into the third edition of the *Principles*.[14] If these adjustments to the text were supposed to be more than marginal he would have presumably said so. After

[13] The derivation of an optimal aggregate production function from data on the production functions of individual farms is technically a problem in the Calculus of Variation. It is obvious that diminishing returns at the individual level is not a necessary and sufficient condition for an aggregate "diminishing returns" production function. For an exhaustive treatment of this problem see, P. A. Samuelson, "A Modern Treatment of the Ricardian Economy," *Quarterly Journal of Economics,* 1959, pp. 20–28.

[14] These deletions and insertions were put into brackets in passages *A* and *B* from the *Principles,* reproduced in the series above.

all, when he felt that on the "machinery-wages" issue his "opinion ... had undergone considerable change" he made an explicit statement to that effect, and inserted a new chapter—"On Machinery"—into the third edition. The alternative procedure which he adopted in this case clearly suggests that these reformulations were just meant to clarify the original statements. In particular, they were supposed to be fully consistent with the original context in which they were embedded, and were not assumed to alter any of its essential implications.[15]

A rejection of the "diminishing returns" model as the fundamental theoretical structure of the *Principles* must also be ruled out because of the important implications for several "conventional" Ricardian propositions. The theory of rent and the theory of the falling profit rate collapse if the relevant range of the macro economic production function is not subject to diminishing returns. So does the doctrine of the stationary state, which depends on the falling profit rate theorem. Furthermore a "diminishing returns" macro economic model is indispensable for a full explanation of the position adopted by Ricardo in the "corn law" debate to which he adhered to the end.[16]

The *Notes* proposition on relative shares could thus not be upheld if the "diminishing returns" model is identified as Ricardo's fundamental theoretical structure. It is however of some interest to underline the logic of Ricardo's reasoning, which led him to the formulation of the alternative model with which this proposition is fully consistent. In the *Principles* he relied entirely on numerical illustrations attributed to a specific farm which, at the next stage, was identified with the system as a whole. However, in the strategic *Note 113* (passage *H* above), he followed a novel line, never used in the *Principles*. In effect, he attempted to derive an aggregate returns schedule from data on micro economic returns schedules, by applying the principle that the respective entries for the optimal macro schedule is the highest marginal return at either the intensive or the extensive margin. Thus, by stumbling upon the aggregation problem, the theoretical significance of which presumably evaded him, Ricardo hit upon his alternative *Notes* model. Hence, the result on the rental share which did not tally with the proposition derived from his "basic" model.

PREDICTION AND REALITY

Ricardo's attempt to draw back from what seemed to him an exposed position—his original proposition on the trend of the share of rent—is of some interest to the history of economic analysis because of its specific context. It is an early example of the reaction of an economist of the highest stature to this everlasting and tricky problem—the confrontation of prediction derived from his model with reality.

The diminishing returns model of the *Essay* and the *Principles*, forged as it was as an analytical tool for the study of the implications of the corn laws, implied a rising trend of rent. Returns which were assumed to diminish linearly implied also a rising trend of rent as a relative share. Ricardo's statements were imbued with predictions of these specific results. This

[15] Because of these considerations we have adhered to the formulations of the 1st and 2nd edition of the "*Principles*" in our interpretation of the significance of the Principles model. See pp. 131–3 above.

[16] Ricardo's comparative cost theorem admittedly did not assume a diminishing returns production function. His case for repeal was, however, always supported by references to the expected benefits of free trade to capitalists and consequently to labourers. A resulting higher profit rate, more capital accumulation and a greater "wage fund," due to lower corn prices in response to free imports, were always underlined. This, however, assumes a diminishing returns production function in agriculture, since only in this case would the expected contraction of the margin of cultivation result in lower prices.

See, for instance, *Principles*, p. 270, where the effect on the margin of cultivation due to "repeal" is strongly underlined.

was undoubtedly the impression gathered from them by the various political interests, particularly by the landlords, and by Malthus, who, on this subject, acted as their academic spokesman.

In the ensuing debate on the "corn laws," in the aftermath of the Napoleonic wars, the landlords who complained loudly about deteriorating conditions proceeded to show by means of data that their share in social income had fallen and not risen, though according to the Ricardian prediction it should have risen in response to the rapidly growing population and stock of capital. Their case was put by Malthus as follows:

> During the last forty years ... though rents have greatly increased in exchangeable value ... it appears by the returns of the Board of Agriculture, that they are now only a fifth of the gross produce, whereas they were formerly a fourth or a third.[17]

Faced with empirical data which were inconsistent with his prediction, Ricardo in effect admitted defeat. His direct retort to Malthus' quotation of these data consists of *Note 113*, (passage *H*) in which, as we have shown, he implicitly renounced an essential feature of his basic model—diminishing returns. Faced with the full implications of his new position, presumably he would have thought twice before adopting it.

It is, however, interesting to note that even if Ricardo felt bound to accept the data at face value, admission of defeat was altogether unnecessary. He had a way out within the precincts of his model. Ricardo had repeatedly confined "diminishing returns" to a "given state of the arts" and clearly admitted the feasibility of higher returns to given inputs in response to "improvements." By applying this premise he deduced one of his felicitous theorems, namely, that improved agricultural technology has a depressing (short run) effect on rent. Now, since the years under consideration were a period of marked change in British agriculture, of which he was aware, Ricardo could have surely argued that if the data were correct, they only proved that the effect of agricultural improvement swamped the impact of diminishing returns. This would have been consistent with his basic set of premises.

The fact that Ricardo did not adopt this line of reasoning strongly underlines the inherent difficulty in bridging the gap between theory, necessarily involving abstraction from some of the complex of concrete forces, and reality. Obviously, though this proved to be difficult, sometimes, even for him.

> Ricardo offers us the supreme intellectual achievement, unattainable by weaker spirits, of adopting a hypothetical world remote from experience, as though it were the world of experience, and living in it consistently.[18]

[17] T. R. Malthus, *Principles, Works,* Vol. II, p. 191.

[18] This is, of course, Keynes' brilliant personification of Ricardo. See J. M. Keynes, *The General Theory of Employment, Interest and Money* (Macmillan, 1936), p. 192.