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# THE RICARDIAN THEORY OF VALUE AND DISTRIBUTION

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*To David Ricardo*

MY DEAR SIR:

I hope you will have the goodness to state to me your opinion on this point [the effect of changes in wages on values of goods], for it is one on which of all others I most wish to have sound opinions.

Yours most faithfully,

J. R. MCCULLOCH

ENGLISH economics was in a state of ferment at the beginning of the nineteenth century; Adam Smith had founded no cult. The period teemed with able economists; yet David Ricardo, within a decade of his debut, was the acknowledged leader of the young science of economics. Within this decade, indeed, his chief work was done; and it was sufficient to make him the most influential economist of his century. This was an extraordinary achievement of an extraordinary man.

I propose to set forth in this essay my understanding of Ricardo's basic contributions to the theory of value and distribution. In order to provide a sketch of the setting in which Ricardo wrote, I shall first trace the development of two main strands of his theory, the theories of population and rent.[1]

## I. THE THEORY OF POPULATION

If we put aside Smith's principles of the workings of competitive markets, the first pillar of the Ricardian system to be erected was the theory of population. Although this theory has an extensive pre-Malthusian history and gave rise to an enormous early nineteenth-century literature, we shall begin with a sketch of the immediate setting in which Malthus presented the theory and shall trace its development in Malthus' and Ricardo's hands.

William Godwin, an exponent of an intellectual naturalism which did not quite extend to anarchism, achieved considerable fame in the closing years of the

[1] A draft of this paper was completed before the magnificent edition of Ricardo's works edited by Sraffa and Dobb began to appear. I have decided to leave for another occasion the discussion of the new information which this edition contains.

eighteenth century. He proposed the abolition of property, almost all government and law, marriage, the division of labor, and diverse other social institutions—but by peaceful means. It was inseparable from his thought that such "reforms" were meritorious only in the measure that they were freely embraced by all men; for example:

> If, in any society, wealth be estimated at its true value, and accumulation and monopoly be regarded as the seals of mischief, injustice, and dishonour, instead of being treated as titles to attention and deference, in that society the accommodations of human life will tend to their level, and the inequality of conditions will be destroyed. A revolution of opinions is the only means of attaining this inestimable benefit. Every attempt to effect this purpose by means of regulation, will probably be found ill conceived and abortive. Be this as it will, every attempt to correct the distribution of wealth by individual violence, is certainly to be regarded as hostile to the first principles of public security.[2]

Godwin accordingly not only opposed violence and revolution but explicitly stated that "the equality for which we are pleading, is an equality which would succeed to a state of great intellectual improvement."[3]

The rationale of this philosophy is that social systems mold the characters of their members and that most or all of the vices of man are therefore attributable to social institutions: "What is born into the world is an unfinished sketch, without character or distinctive feature impressed upon it."[4] The gradual elimination of institutions such as property, together with the irresistible triumph of truth, would eliminate unsocial ambitions, avarice, sloth, and other imperfections of man. Godwin's vision was noble and his arguments candid and often ingenious. If he was inexcusably neglectful of the influence of men on institutions, he was right in stressing the influence of institutions on men.

In the penultimate chapter of *Political Justice*, we should note, Godwin discussed Robert Wallace's earlier rejection of equality because of "the principle of population." Godwin disputed this pessimistic view on two scores. The first was a brief allusion to the efficacy of moral restraint: "It is impossible where the price of labour is greatly reduced, and an added population threatens a still further reduction, that men should not be considerably under the influence of fear, respecting an early marriage, and a numerous family."[5] The second was that the problem was of no immediate concern: three-quarters of the globe was uncultivated, men wasted most of their productive efforts (under existing institutions) on meretricious objects, and "myriads of centuries" would pass before overpopulation was a real problem.[6]

By a different route Condorcet reached a similar view of the good society—which, however, allowed a much larger place to the sciences.[7] He believed also in the perfectibility of man and the inevitability of progress, less on moral grounds than because a historical survey emphasized to him the cumulative character of knowledge and liberty. He, too, noticed the population problem in a regime of equality:

> It may, however, be demanded, whether, amidst this improvement in industry and happiness, where the wants and faculties of men will continually become better proportioned, each successive generation possess more various stores, and of consequence in each generation

[2] *Enquiry concerning Political Justice* (3d ed.; London, 1798), II, 441.

[3] *Ibid.*, p. 480.

[4] *Ibid.*, I, 37.

[5] *Ibid.*, II, 517.

[6] *Ibid.*, p. 518.

[7] *Outlines of a Historical View of the Progress of the Human Mind* (London: J. Johnson, 1795); the original French edition appeared in 1793.

the number of individuals be greatly increased; it may, I say, be demanded, whether these principles of improvement and increase may not, by their continual operation, ultimately lead to degeneracy and destruction? Whether the number of inhabitants in the universe at length exceeding the means of existence, there will not result a continual decay of happiness and population, and a progress towards barbarism, or at least a sort of oscillation between good and evil?[8]

This problem, however, lay far in the future because of the prospective great advances of technology, and, should it ever threaten to become real, Condorcet alluded to the possible development of contraceptives:

. . . prior to this period [of overpopulation] the progress of reason will walk in hand with that of the sciences; that the absurd prejudices of superstition will have ceased to infuse into morality a harshness that corrupts and degrades, instead of purifying and exalting it; that men will then know, that the duties they may be under relative to propagation will consist not in the question of giving *existence* to a greater number of beings, but *happiness;* will have for their object, the general welfare of the human species; of the society in which they live; of the family to which they are attached; and not the puerile idea of encumbering the earth with useless and wretched mortals.[9]

Among the admirers of Godwin and Condorcet, as we know, there was a Daniel Malthus, and his advocacy of their doctrines led his son, Thomas Robert, to devise the counterarguments soon published as *An Essay on the Principle of Population* (1798). The *Essay* sought to demonstrate the impossibility of all such schemes for the major improvement of mankind because they violated natural (biological) laws. We may summarize the argument briefly in Malthus' own words. Two postulates are stated to be sufficient for this vast demonstration:

First, That food is necessary to the existence of man.

Secondly, That the passion between the sexes is necessary, and will remain nearly in its present state.[10]

Actually, several further assumptions are required, and they are implied in the basic statement of the theory:

Assuming then, my postulata as granted, I say, that the power of population is indefinitely greater than the power in the earth to produce subsistence for man.

Population, when unchecked, increases in a geometrical ratio. Subsistence increases only in an arithmetical ratio. A slight acquaintance with numbers will show the immensity of the first power in comparison of the second.

By that law of our nature which makes food necessary to the life of man, the effects of these two unequal powers must be kept equal.

This implies a strong and constantly operating check on population from the difficulty of subsistence. This difficulty must fall some where; and must necessarily be severely felt by a large portion of mankind.[11]

Thus the argument moves rapidly; by page 37, Malthus feels "at a loss to conjecture what part of it can be denied."

The ratios are supported with a parsimony of evidence. Only one example was necessary to show the power of population to grow at a geometrical rate—it doubled every twenty-five years in the United States.[12] The law of growth of subsistence is supported by assertions of incredulity:

Let us now take any spot of earth, this Island for instance, and see in what ratio the subsistence it affords can be supposed to increase. We will begin with it under its present state of cultivation.

If I allow that by the best possible policy, by breaking up more land, and by great encourage-

[8] *Ibid.*, pp. 344–45.

[9] *Ibid.*, pp. 346–47.

[10] *Essay* ("Reprints of the Royal Economic Society" [London, 1926]), p. 11.

[11] *Ibid.*, pp. 13–14.

[12] *Ibid.*, p. 20. This fact came from Richard Price's *Observations on Reversionary Payments* (4th ed.; London, 1783), I, 282, where it is restricted to the "northern colonies." It represents the estimate of a Dr. Styles, and the role of immigration is not discussed by Price or by Malthus.

ments to agriculture, the produce of this Island may be doubled in the first twenty-five years, I think it will be allowing as much as any person can well demand.

In the next twenty-five years, it is impossible to suppose that the produce could be quadrupled. It would be contrary to all our knowledge of the qualities of land. The very utmost that we can conceive, is, that the increase in the second twenty-five years might equal the present produce. Let us then take this for our rule, though certainly far beyond the truth; . . . The most enthusiastic speculator cannot suppose a greater increase than this. In a few centuries it would make every acre of land in the Island like a garden.

Yet this ratio of increase is evidently arithmetical.[13]

The contradiction between the ratios is solved by the checks to population, all of which may be classified under two heads. The basic, inevitable check is misery, operating through all the channels that malnutrition may find. A second, highly probable, check is vice, under which Malthus includes not only sexual promiscuity but at times also war. Still another check—postponement of marriage because of prudence—is mentioned, but it is given little attention, because in Malthus' opinion it is almost always accompanied by vice.[14] Condorcet's suggestion of contraception is dismissed with a reprimand.[15]

Let us now probe more deeply. Are the two ratios to be taken literally? One cannot be too sure of Malthus' intention; certainly he used these ratios frequently enough to the end of his life. But one can say that they were often taken literally and that to them the *Essay* owed its powerful impact. It would have been enough for Malthus' position if he had merely asserted that the rate of growth of population, unless repressed by the checks, *far* exceeded the rate of growth of subsistence. Yet, from the viewpoint of persuasion, the ratios probably had to be of different mathematical forms. Although an annual increase of population by 2 per cent would as surely overwhelm an annual increase of 1 per cent in the means of subsistence—the former doubles in thirty-five years, the latter in seventy years—it would have reduced the argument to the question of the facts of growth, and here no man's voice was loud.

No explicit trace of the law of diminishing returns was present; yet Malthus' ratios implicitly assumed sharply diminishing returns, for his numbers define the production function,

$$L = 2^{P-1},$$

where $L$ is labor (proportional to population) and $P$ is produce. With this production function, indeed, if workers received a wage equal to their marginal product, the aggregate wage bill would be independent of the size of the labor force, and population simply could not grow![16]

Finally, was the level of subsistence of the masses some biological minimum or was it culturally determined? Malthus is reasonably clear that usually it is a cultural minimum, well above the biological minimum. For he admits of "some variation for the prevalence of luxury, or of frugal habits," and agrees with Adam Smith that the population would increase greatly if Englishmen were to adopt a

[13] *Essay*, pp. 21–22.

[14] *Ibid.*, pp. 28–29, 62–70.

[15] "He alludes, either to a promiscuous concubinage, which would prevent breeding, or to something else as unnatural. To remove the difficulty in this way, will, surely, in the opinion of most men, be, to destroy that virtue, and purity of manners, which the advocates of equality, and of the perfectibility of man, profess to be the end and object of their views" (*ibid.*, p. 154).

[16] For

$$L\frac{dP}{dL} = \frac{1}{\log_e 2}.$$

potato diet.[17] We should notice that this cultural minimum impairs some of the arguments against perfectibility, for men can presumably be taught to insist upon a high minimum. It does not affect the law as an economic generalization, however, if the minimum is fairly stable.

Godwin replied to Malthus (and to other less temperate critics) with courtesy and cogency.[18] The principle of population was greeted as a major contribution to political economy and to the understanding of society. But, Godwin properly argued, this principle denied all possibility of large progress and had no special relevance to Godwin's proposals.[19] Nevertheless, it did bear also on Godwin's hopes; and against it he had two defenses. First, infanticide, abortion, and similar practices, though "painful and repulsive," are preferable to Malthus' checks of misery and vice: "If the alternative were complete, I had rather such a child should perish in the first hour of its existence, than that a man should spend seventy years of life in a state of misery and vice."[20] Second, men of the more enlightened classes already postpone marriage to avoid the poverty resulting from a great family, and in Godwin's society this prudence will be characteristic of the entire population.[21] Surely Godwin was right, judged not only by the historical fact that this was the one objection to his system that the nineteenth century removed but also by contemporary evidence of widespread postponement of marriage, which indicated that this sort of behavior was not beyond mortal man.

Malthus capitulated, while still claiming victory, when in the second edition of the *Essay* (1803) he gave special prominence to a new preventive check (in addition to vice) to population—moral restraint:

> The preventive check, is peculiar to man, and arises from that distinctive superiority in his reasoning faculties, which enables him to calculate distant consequences. . . . These considerations are calculated to prevent, and certainly do prevent, a great number of persons in all civilized nations from pursuing the dictate of nature in an early attachment to one woman.
>
> If this restraint does not produce vice, as in many instances is the case, and very generally so among the middle and higher classes of men, it is undoubtedly the least evil that can arise from the principle of population.[22]

Given the possible—although in Malthus' opinion the improbable—efficacy of the moral restraint, Godwin had carried this issue; and, with the steady decline of his popularity and influence, he was also losing the argument for perfectibility. Henceforth, however, population received more attention, and Godwin's schemes less. Yet this origin left a permanent imprint on the formulation of Malthus' doctrine, and it explains in part why he was content to leave the economics of population at a very preliminary stage.

Aside from the addition of the check by moral restraint, only one substantially new factor was introduced in the later editions of the *Essay*, and this was diminishing returns:

[17] *Essay*, pp. 55, 130–37.

[18] *Thoughts Occasioned by the Perusal of Dr. Parr's Spital Sermon* (London, 1801).

[19] "The reasonings of the *Essay on Population* did not bear with any particular stress upon my hypothesis . . ." (*ibid.*, p. 55).

[20] *Ibid.*, p. 65.

[21] *Ibid.*, pp. 72–73.

[22] *Parallel Chapters from the First and Second Editions of an Essay on Population*, ed. W. J. Ashley (New York, 1895), pp. 87, 88. Moral restraint is formally defined as the preventive check "which is not followed by irregular gratifications" (*ibid.*, p. 90). It is apparent that only on strained meanings will misery, vice, and moral restraint embrace all checks to population, as Malthus repeatedly claims. He is forced to discuss emigration as a short-lived palliative and alludes to contraceptives as a form of vice.

When acre has been added to acre till all the fertile land is occupied, the yearly increase of food must depend upon the melioration of the land already in possession. This is a stream, which, from the nature of all soils, instead of increasing, must be gradually diminishing.

The improvements of the barren parts [of a nation] would be a work of time and labour; and it must be evident to those who have the slightest acquaintance with agricultural subjects, that in proportion as cultivation extended, the additions that could yearly be made to the former average produce, must be gradually and regularly diminishing.[23]

This concept of diminishing returns—if anything so muddy can be called a concept—was not elaborated or given much emphasis, and Malthus was quite willing to deny diminishing returns when a particular point might be served.[24]

Indeed, one is impressed by Malthus' lack of interest in the economics of population. The concept of a subsistence level is not analyzed, nor are the factors which determine its height and changes isolated. The time necessary for population to respond to changes in the means of subsistence is left vague: Is it two years,[25] or is it the generations during which social customs respecting marriage are slowly modified?

Most important of all, there is no analysis of the factors which govern the rate of growth of output and hence (on his theory) of population. Some elements of such a theory are implicit in Malthus' defense of the mixed agricultural-commercial (industrial) economy.[26] Malthus was a forerunner of the current writers on the "industrialization of backward areas"; his variation, however, was the equally desirable "agriculturalization of industrial areas."

Malthus assumed that the welfare of the masses of population depended chiefly on the supply of bread; so agriculture was the basic industry. The chief role of manufactures—and this only in a society with an unequal ("feudal") distribution of property—was to entice the landlords to cultivate the land intensively to procure luxuries. In his own words:

Agriculture is not only, as Hume states, that species of industry, which is chiefly requisite to the subsistence of multitudes, but it is in fact the *sole* species by which multitudes can exist; and all the numerous arts and manufactures of the modern world, by which such numbers appear to be supported, have no tendency whatever to increase population, except so far as they tend to increase the quantity and facilitate the distribution of the products of agriculture.[27]

This would suggest that a nation ought to be agricultural; and Malthus skirts this view but rejects it because—a characteristic irrelevance—some agricultural nations have poor governments or a poor distribution of ownership of property and because manufactures provide a market for labor that undermines feudalism.[28]

Yet he rejects the commercial nation even more completely. Foreign competition will eventually eliminate large profits from manufacturing, and so also will domestic competition. (Malthus seems to have had the peculiar notion that the competitive rate of return in manufactures must soon fall to low levels, with the accumulation of capital, but that in agriculture it remains high.) The industrial nation may suffer if its agricultural

[23] *Ibid.*, pp. 82, 84.

[24] For example, he asserts that in England diminishing returns did not hold in the twenty years before 1814 (*Essay* [8th ed.; London, 1878], pp. 360–61). Here Malthus was arguing for import duties on corn.

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

[26] *Ibid.*, Book III, chaps. viii–x. His proagricultural bias diminished but did not disappear with time (see J. Bonar, *Malthus and His Work* [London, 1924], pp. 245 ff.).

[27] *Essay* (8th ed.), p. 112.

[28] Another advantage claimed for manufactures is that wages are in proportion to corn prices, so the nonfood component of the standard of living of the masses will be larger with cheap manufactures. This is simply inconsistent with the principle of population.

customers suffer from indolence or misgovernment, and more certainly it must decline when eventually the agricultural nations develop their own manufactures. The mixed economy somehow avoids all these objections and reaps all the advantages of both systems.

Here, as elsewhere, Malthus purveyed a strange mixture of occasional insights and drab fallacies. His belief in the essentially developmental role of a nation's specialization clashed with his belief that a balanced economy represented an optimum and stable policy. He was able to dismiss the prosperity flowing from trade and industry only by shrinking generations into hours, and England would never have risen to its pinnacle if it had followed his advice.

The *Essay* became much longer and vastly duller, when Malthus added long accounts of population in ancient, primitive, and modern agricultural and industrial states. These descriptive accounts did not demonstrate the principle of population, as he claimed; rather, they demonstrated that death comes in many forms and that births are influenced by social customs. Malthus simply had no canons of evidence. He recited—and embroidered—travelers' accounts of primitive societies, seizing like a gossip columnist upon every reference to misery and vice and ignoring those to prosperity or virtue. He found the principle of population confirmed in the prosperity of England during the twenty years before 1811 and also by the depression after the Napoleonic wars.[29]

What evidence could have been used to test the theory? If the subsistence level has any stability, and hence any significance, Malthus' theory was wrong if the standard of living of the masses rose for any considerable period of time. He did not investigate this possibility (but see below) and ignored the opinions of such authorities as Sir Frederick Eden that it had been rising for a century.[30] His theory was also contradicted if population grew at a constant geometrical rate in an "old" country, for then the means of subsistence were also growing at this rate, since population never precedes food.[31] Despite the rapid increase of population in almost all western European nations at the time, which he duly noted, he persisted in considering this as only a confirmation of his fecundity hypothesis.[32]

Malthus kept his *Political Economy* in a separate compartment from his *Essay*. Though there were many uses of, and many deferential references to, the principle of population in the *Political Economy*, in the discussion of wages the principle was substantially ignored. For example:

> This great increase of command over the first necessary of life [from 1720 to 1750] did not, however, produce a proportionate increase of population. It found the people of this country living under a good government, and enjoying all the advantages of civil and political liberty in an unusual degree. The lower classes of people had been in the habit of being respected, both by the laws and the higher orders of their fellow citizens, and had learned in consequence to respect themselves. The result was, that their increased corn wages, instead of occasioning an increase of population exclusively, were so expended as to occasion a decided elevation in the standard of their comforts and conveniences.[33]

In a historical survey of wages, he finds them rising from the mid-fourteenth to

[29] *Essay* (8th ed.), p. 425.

[30] *The State of the Poor* (London, 1797), I, 560 ff.

[31] *Essay* (8th ed.), p. 384 n.

[32] In the first edition of the *Essay*, Malthus conjectured that the population of England was almost stable: "It is difficult, however, to conceive that the population of England has been declining since the revolution; although every testimony concurs to prove that its increase, if it has increased, has been very slow" (p. 314).

[33] *Principles of Political Economy* (2d ed ; "London School Reprints," 1936), p 228

the sixteenth century, then falling for a century—hardly a clear example of a strong tendency of wages to approach a subsistence level.[34] Indeed, Malthus goes so far as to investigate the factors (liberty and education) which lead workers to increase their standard of comfort rather than their numbers when income rises. Like a successful general, Malthus occupied all the positions.

Ricardo accepted the simple version of the first edition of the *Essay*, in which wages were always equal to some fixed ("subsistence") level in the long run:

> . . . No point is better established, than that the supply of labourers will always ultimately be in proportion to the means of supporting them. . . . So great are the delights of domestic society, that in practice it is invariably found that an increase of population follows the amended condition of the labourer.[35]

This was Ricardo's general assumption; but, when he came to analyze wages, the Malthusian theory was virtually ignored:

> Notwithstanding the tendency of wages to conform to their natural rate, their market rate may, in an improving society, for an indefinite period, be constantly above it; for no sooner may the impulse, which an increased capital gives to a new demand for labour be obeyed, than another increase of capital may produce the same effect; and thus, if the increase of capital be gradual and constant, the demand for labour may give a continued stimulus to an increase of people.
>
> It is not to be understood that the natural price of labor, estimated even in food and necessaries, is absolutely fixed and constant. It varies at different times in the same country, and very materially differs in different countries.[36]

Even the arithmetic rate of growth of subsistence is questioned:

> It has been calculated, that under favourable circumstances population may be doubled in twenty-five years; but under the same favourable circumstances, the whole capital of a country might possibly be doubled in a shorter period.[37]

One can disregard the last passage, as pertaining only to new countries, but the indefinitely prolonged excess of the market over the natural wage rate and the possibility of a steady upward movement of the natural rate must simply be recorded as correct views which Ricardo did not know how to incorporate into his theoretical system.

The later history of the Malthusian theory is beyond our province, but we should notice that it was not popular among the best economists. Longfield rejected the theory,[38] and Senior proposed, in an ironical letter to Malthus, an alternative "nomenclature": "I should still say, that, in the absence of disturbing causes, food has a tendency to increase faster than population, because, in fact, it has generally done so. . . ."[39] Had not John Stuart Mill lent to it his great authority, it would have been declining rapidly in importance by mid-century.

The "principle of population" had the dubious honor of receiving from history one of the most emphatic refutations any prominent economic theory has ever received. It is now fashionable to defend Malthus by saying that his theory applies to other places and times than those to which he and his readers applied it. This may be true, but it is tantamount to scientific nihilism to deduce from it any defense of Malthus. It is an odd theory

[34] *Ibid.*, Book I, chap. iv. The investigation was tenuous in the extreme, however; only the prices of corn and labor were compared, on his customary assumption that grain was the basic element of the standard of living of the workers. If it ever had this role, it had probably lost it by the seventeenth century.

[35] *Principles of Political Economy and Taxation*, ed. P. Sraffa and M. Dobb (Cambridge, England, 1951), pp. 292, 407; also pp. 219, 398.

[36] *Ibid.*, pp. 94–95, 96.

[37] *Ibid.*, p. 98.

[38] *Lectures on Political Economy* ("London School Reprints" [London, 1931]), Appendix.

[39] *Two Lectures on Population* (London, 1829), p. 58.

that may not some day and somewhere find a role; for every answer one can find a correct question.

And yet Malthus deserves commendation for two important services that rise above the quality of his work. The first is that he gave population an important role in economic theory. The very failure of his theory was a large cause for the near-abandonment of population studies by later economists, and this seriously reduces his contribution to economics but does not eliminate it. The second service was the recognition that it is possible to deal fruitfully with population in terms of conventional economic theory. The identification of cost of subsistence with cost of production was illegitimate, but the explanation of birth-rate differentials through differentials in costs may well prove to be an important avenue through which economists may make contributions to the study of population.

## II. THE THEORY OF RENT

England began its era of continuous importation of wheat—sporadic importation began a generation earlier—in the same year that it embarked upon the Napoleonic Wars, 1793. In June of this year, wheat was 51*s*. a quarter. It rose to 80*s*. in 1796, and after a drop rose again to 128*s*. in 1801, fell again up to 1804, and then began to rise and finally reached 152*s*. in August, 1812. Thereafter it fell sharply but irregularly, until it had fallen to 41*s*. by 1822.[40] The law of 1804 provided for export bounties if the price fell below 54*s*. and high import duties (30*s*.) when the price was less than 60*s*., but low duties ($7\frac{1}{2}d$.) when the price was above 66*s*. The wartime inflation had wholly outmoded this act, and moves for new protection began in 1813, as prices began to fall; and in 1814 both Lords and Commons appointed committees to report on the question. Their reports were the apparent stimulus to the publication of the pamphlets of West and Malthus. (At least West's pamphlet, however, was no stimulus to Lords and Commons; in 1815 they enacted a prohibition on importation when the price fell below 80*s*. and free importation at higher levels.)

The hearings before these committees emphasized the relationship between the high corn prices and the more intensive and extensive cultivation of the soil in the years up to 1812. Indeed, even the questions before the Lords' committee were sufficiently emphatic on the relationship:

> If the prices continue as low as at present, even if you were to pay no rent for such a farm as yours is, could you continue to raise grain and cultivate it in the same expensive manner you have recently cultivated it? (Reply: "Certainly not; . . . I must certainly discharge one third of my hands.")
>
> Supposing that wheat was to fall to 3*l*. 10*s*. permanently upon an average, . . . could the farmer continue to cultivate that species of land which you have mentioned as being poor cold land? (Reply: "I think not; that would be the lowest price; he could scarcely get any profit upon that.")[41]

Although there were ample clues for the development of the classical rent theory, it would be unjust to treat the inventors of the theory as mere codifiers of generally accepted and realized truth. These hearings had their full share of irrelevancies and inconsistencies—as hearings usually do—and the outlines of the theory in the facts of the time are undoubtedly much clearer to modern than to contemporary eyes.[42]

[40] See C. R. Fay, *The Corn Laws and Social England* (Cambridge, England, 1932); and Thomas Tooke, *A History of Prices* (London, 1838), II, 390.

[41] *Reports Respecting Grain, and the Corn Laws* ("Sessional Papers, 1814–15"), V, 18, 30.

[42] Thus Arthur Young listed the rise of population, taxes, and foreign trade (as a measure of

Had Sir Edward West been less successful in the law, he might have been a leading economist of the era. His pamphlet displays a mind that was inventive and logically bent, and he had a rare talent for marshaling evidence to bear on a theory.[43] He immediately sets forth "a principle in political economy":

> The principle is simply this, that in the progress of the improvement of cultivation the raising of rude produce becomes progressively more expensive, or, in other words, the ratio of the net produce of land to its gross produce is continually diminishing. . . .
>
> Each equal additional quantity of work bestowed on agriculture, yields an actually diminished return, and of course if each equal additional quantity of work yields an actually diminished return, the whole of the work bestowed on agriculture in the progress of improvement, yields an actually diminished proportionate return. Whereas it is obvious that an equal quantity of work will always fabricate the same quantity of manufactures.[44]

The "progress of improvement" must be interpreted to mean the growth of output; West, like Malthus and Ricardo, gave little thought to technological improvements. The mistaken identification of diminishing average and diminishing marginal products also continued throughout the Ricardian literature. West found diminishing returns to be due to the necessity for resort to inferior lands,[45] but more fundamentally it was due to the diminishing returns from more intensive cultivation. This was proved by what was essentially an inference from the fact that simultaneous cultivation of different grades of soil existed in stable equilibrium:

> And the very fact that in the progress of society new land is brought into cultivation, proves that additional work cannot be bestowed with the same advantage as before on the old land. For 100 acres of the rich land will, of course, yield a larger return to the work of 10 men, than 100 acres of inferior land will do, and if this same rich land would continue to yield the same proportionate return to the work of 20 and 30 and 100 as it did to that of 10 labourers, the inferior land would never be cultivated at all.[46]

West contributed two additional lines of demonstration of the law, and both were ingenious, although unconvincing. The first is summarized in his own words:

> The division of labour and application of machinery render labour more and more productive in manufactures, in the progress of improvement; the same causes *tend* also to make labour more and more productive in agriculture in the progress of improvement. But another cause, namely, the necessity of having recourse to land inferior to that already in tillage, or of cultivating the same land more expensively, *tends* to make labour in agriculture less productive in the progress of improvement. And the latter cause more than counteracts the effects of machinery and the division of labour in agriculture; because, otherwise agricultural labour would either become more productive, or remain equally productive, in the progress of improvement.
>
> In either of which cases, since labour in manufactures becomes more productive, *all* labour would become more productive, and the profits of stock, which are the net reproduction, would, of course, rise in the progress of improvement. But the profits of stock are known to fall in the progress of improvement, and, therefore, neither of the first two first suppositions is the fact, and

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wealth) as the sufficient explanations for the rising price of corn, and he attributed the rise of rents chiefly to investments of landlords (*Report from the Select Committee on Petitions Relating to the Corn Laws of This Kingdom* ["Sessional Papers, 1813–14"], III, 82, 86).

[43] *The Application of Capital to Land* (1815), reprinted with an Introduction by J. H. Hollander (Baltimore, 1903).

[44] *Ibid.*, pp. 9, 12. The mistaken equivalence of the first two parts of the first sentence will be noticed later.

[45] "Consider the case of a new colony; the first occupiers have their choice of the land, and of course cultivate the richest spots in the country: the next comers must take the second in quality, which will return less to their labour, and so each successive additional set of cultivators must necessarily produce less than their predecessors" (*ibid.*, p. 13).

[46] *Ibid.*, p. 14.

labour in agriculture must, in the progress of improvement, become actually less productive. It is then shewn that this effect cannot be produced by a rise in the real wages of labour.[47]

Unfortunately, the last sentence claims too much: he was not able to show that the fall in the rate of profits could not be due to a rise of wages.[48] This elegantly contrived analysis is very similar to Ricardo's theory, except that the fall of profits is a historical generalization rather than (as with Ricardo) an analytical theorem.

The second proof was that, as a matter of historical fact, rent was a declining share of the total product of agriculture, and this was equivalent to diminishing returns—an equivalence so complete that this was an alternative way of stating the law of diminishing returns. But a decline of rent relative to total produce does not rigorously imply either diminishing average product or diminishing marginal product of labor; wage rates may be rising enough to cause the decline in the share of rent.[49] The argument is perverse, in that if rent were a rising share of total product, then one could deduce the existence of diminishing marginal returns.[50] The whole analysis, however, is dependent on a constant state of technology.

From the theory of diminishing returns, West succinctly developed the classical rent theory:

> If in case of any increased demand for corn, capital could be laid out to the same advantage as before, the growing price of the increased quantity would be the same as before, and competition would, of course, soon reduce the actual price to the growing price, and there could be no increase of rent. But on any increased demand for corn, the capital I have shewn which is laid out to meet this increased demand is laid out to less advantage. The growing price, therefore, of the additional quantity wanted is increased, and the actual price of that quantity must also be increased. But the corn that is raised at the least expense will, of course, sell for the same price as that raised at the greatest, and consequently the price of all corn is raised by the increased demand. But the farmer gets only the common profits of stock on his growth, which is afforded even on that corn which is raised at the greatest expense; all the additional profit, therefore, on that part of the produce which is raised at a less expense, goes to the landlord in the shape of rent.[51]

The theory is deftly used to refute the arguments of Sir Henry Parnell that the prohibition of importation of grain will lower the domestic price, and to estimate

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[47] *Ibid.*, pp. 23-24.

[48] West used three lines of argument to show this. First, he asserted that the rate of population increase diminishes in the progress of improvement, so that, on Malthusian grounds, real wages must be diminishing (*ibid.*, p. 20). He was factually wrong on population growth, and it seems inconsistent to employ Malthus' theory, which assumes constant real wages, to disprove the existence of rising real wages. Second, he argued that high wages are always accompanied by a high rate of profits. In substance he held a wage-fund doctrine and believed that high profit rates would lead to a high rate of increases of the wages fund (the degree of parsimony being given) and thus to a more rapid rise of wage rates (*ibid.*, pp. 22–23). Third, he argued that wages and profits are both high in America, so that high wages are not the cause of low profits (*ibid.*, pp. 21–22). But at most this shows that profits depend upon other variables as well as on wage rates.

[49] Let $P$ be product, $N$, the number of laborers, and $P'$ the marginal product of labor. Then the proportion of rent to total product is

$$\frac{P - NP'}{P},$$

and its derivative with respect to $N$ is negative if

$$NPP'' + PP' > N(P')^2,$$

or

$$PP'' > P'\left(P' - \frac{P}{N}\right).$$

One cannot deduce from this either a decreasing average product—which requires $(P' - P/N)$ to be negative—or a decreasing marginal product, $P'' < 0$.

[50] In the notation of the previous footnote, then $NPP'' + PP' < N(P')^2$ and, since $-P'(P - NP')$ must be negative if rents are positive, $P''$ must be negative.

[51] *The Application of Capital to Land*, p. 39.

the price of wheat under such a prohibition (at least 90*s*.) and in the absence of all import duties (perhaps 60*s*.). West also makes an elegant analysis of the effects of the 1688 export bounty on grain. His pamphlet contains a quality of economics that is not exceeded in his generation.

Almost simultaneously Malthus proposed much the same theory, but with much less incisiveness and clarity.[52] He managed to invent two errors for each truth, and some of Ricardo's analysis can be viewed as a reaction to Malthus' peculiar approach. Three causes of the high price of raw produce (relative to the cost of production) were found:

> First, and mainly, That quality of the earth, by which it can be made to yield a greater portion of the necessaries of life than is required for the maintenance of the persons employed on the land.
>
> 2dly, That quality peculiar to the necessaries of life of being able to create their own demand, or to raise up a number of demanders in proportion to the quantity of necessaries produced.
>
> And, 3dly, The comparative scarcity of the most fertile land.[53]

The first cause of rent may charitably be read as a clumsy statement that land must be productive.[54] The second cause is formally irrelevant: rent could appear in a society in which the demand for corn was forever constant.[55] Yet the statement contains an important element of truth: rents will be higher, the more rapidly the demand for agricultural produce grows. The third cause is, of course, a sufficient, although not a necessary, condition for the existence of rent.[56]

The existence of diminishing returns on superior land was demonstrated by Malthus, as by West, by the resort to inferior land.[57] The determination of rent was also substantively identical with West's theory: rent was the excess of produce over the return on the capital (wage advances) of the farmer (tenant), which equaled the marginal product of labor times the amount of labor. Aside from this one contribution, however, the pamphlet was an undistinguished performance. It had many erroneous dicta, such as that improvements in agriculture always increase rent[58] and that the theory of rent for corn lands differs from the theory for vineyards, because the products of the latter have no influence on population! A tortured defense of a high price of corn and large rents was his chief

[52] *An Inquiry into the Nature and Progress of Rent*, reprinted with an Introduction by J. H. Hollander (Baltimore, 1903).

[53] *Ibid.*, p. 15.

[54] Actually, Malthus means it as a requirement that the total produce be in excess of the subsistence level of the worker. This is a condition necessary for the continuous *payment* of rent by tenants to landlords but not for the existence of a surplus over the quantity of labor times its marginal product.

[55] Malthus states the contrary: that, if population is constant, an abundant produce "might reduce the price of raw produce, like the price of manufactures, to the cost of production" (*Nature and Progress of Rent*, p. 16). The trivial condition under which this is true is excluded by the third cause.

[56] Ricardo wrote to Malthus that "your first and third causes of high price appear to me to be directly at variance with each other. The first is the fertility of land, the third the scarcity of fertile land" (January 24, 1817, *Letters of David Ricardo to Thomas Robert Malthus* [Oxford, 1887], p. 127). The paradox is verbal: fertility in this realm of discourse is an economic property of land and is measured by its price; hence scarcity and fertility represent the same forces.

[57] *Nature and Progress of Rent*, p. 27. It may be remarked that no one stated the law correctly with reference to this point. All these writers applied equal quantities of capital and labor to equal areas of land to measure differential rent. This violated the "best technology" assumption: equal quantities of capital-and-labor on different lands would not reveal the full difference in their productivity and might even reverse it. One should apply equal quantities of capital-and-labor to such quantities of each quality of land that the optimum technology is used on each quality of land.

[58] *Ibid.*, p. 24.

theme (it was dictated by Malthus' protectionism), and it was argued on such grounds as that it is a sign of wealth for a nation to pay a high price for corn[59] and that laborers are not injured by a high price of corn if wages rise even more than corn prices.[60]

The muddled protectionism of Malthus offered a natural foil to Ricardo, who had no trouble in pointing out many inconsistencies in Malthus' argument.[61] Whether from an unrestrained love of paradox or from a general antipathy toward landlords, Ricardo wrote with more malice than reason:

> It follows, then, that the interest of the landlord is always opposed to the interest of every other class in the community.
>
> I shall greatly regret that considerations for any particular class, are allowed to check the progress of the wealth and population of the country. If the interests of the landlord be of sufficient consequence, to determine us not to avail ourselves of all the benefits which would follow from importing corn at a cheap price, they should also influence us in rejecting all improvements in agriculture, and in the implements of husbandry. . . .[62]

[59] *Ibid.*, p. 39.

[60] Even for Malthus the argument is extraordinarily imprecise; consider the relations between these three statements:

"There is nothing so absolutely unavoidable in the progress of society as the fall of wages . . ." (*ibid.*, p. 22).

"We see in consequence, that in spite of continued improvements in agriculture, the money price of corn is *caeteris paribus* the highest in the richest countries . . ." (*ibid.*, p. 38).

"With regard to the labouring classes of society, it is a very short-sighted view of the subject, which contemplates, with alarm, the high price of corn as certainly injurious to them. . . . And I do not scruple distinctly to affirm, that under similar [prudential] habits, and a similar demand for labour, the high price of corn, when it has time to produce its natural effects, so far from being a disadvantage to them, is a positive and unquestionable advantage" (*ibid.*, pp. 39–40).

The last view is based on the belief, already encountered in the *Essay*, that population follows food supply, not real wages.

[61] See esp. *Principles*, chap. xxxii.

In his own formulation of the rent doctrine, Ricardo went beyond West at one point: the analysis of the effects of improvements on rent.[63] Improvements were classified in two types: those which increase the output from given land and those which reduce the amount of labor necessary to produce a given product from given land.[64] These classes are not mutually exclusive, although Ricardo so implies.

In dealing with the first, or land-saving, improvements, Ricardo assumed (i) that the quantity of corn demanded was independent of its price—his customary assumption—and (ii) that the marginal product curve of labor on land was shifted upward a constant amount by the improvement. It then follows, as he argues from numerical examples, that rent will be reduced.[65] In the second class of improvements (which is surely vacuous under his definition), the effect on rent depends on the changes in the shape of the marginal product of labor curve.

Ricardo was prone to exaggerate the conflict of interests between landlords and other economic classes, and his discussions of improvements in agricultural techniques is an important example of this. Under his usual assumptions his conclusion should have been that im-

[62] *An Essay on the Influence of a Low Price of Corn on the Profits of Stock* (*Works*, ed. Sraffa and Dobb, IV, 21, 41); also *Principles*, pp. 335–36, 400.

[63] Ricardo was independently approaching the theory of rent before the pamphlets of West and Malthus appeared (see his letters to Malthus in 1814).

[64] *Principles*, p. 80.

[65] For a geometrical illustration see A. Marshall, *Principles of Economics* (8th ed.; London, 1920), p. 835. In effect, Ricardo defined the production function as $\phi(N)$ where $N$ is the number of laborers, before the improvement, and as $\phi(N) + aN$ after the improvement. With diminishing marginal returns, rent varies with the number of workers; and fewer workers are now needed to produce the same product.

provements always benefit the landlords: the marginal product curve of capital-and-labor is higher relative to the cost of capital-and-labor,[66] and, since the supply of labor is infinitely elastic at a given real wage, rents must rise in the long run. It cannot be said that he wholly ignored this implication,[67] but he chose, for a change, to emphasize only the short-run effects, and then only in the adverse case.[68]

The theory of rent as these men used it could be properly applied only to a resource whose commercial supply was rigidly fixed and which could be used for only one purpose—the raising of corn. It is astonishing how easily and implicitly they identified this resource with British agricultural land, although the supply of land was being increased, and hardly without cost, and although this land was improved by investments of infinitely varied durability. Ricardo may be interpreted as attempting to avoid this identification by his definition of rent as the payment for the use of "the original and indestructible powers of the soil."[69] Yet, after this preliminary gesture—which is inadequate—he usually identified rent with the contemporary payments to landlords. The aggregation of all uses of land into "raising corn" is noticed rather than questioned by Malthus.[70]

This *Anschauung* may not have been particularly objectionable with respect to the problems in which Ricardo was interested. Grain formed a very large part of the standard of living of the working classes (perhaps one-third of total expenditures), and the elasticity of supply of land was doubtless relatively small in the moderately short run. But it is illuminating to see what an astonishingly narrow range of problems Ricardo could be interested in if he found this theory adequate. The structure and trend of individual prices, which had called forth some of Smith's best analysis[71] and which became the central concern of neoclassical economics, were simply outside his domain.

At the level of technical analysis, the theory of rent marked a large advance over Smith's looser formulations. Yet it is noteworthy that Ricardo did not have that instinct for symmetry and generality which we now associate with the formal theorist. The law of diminishing returns was never applied outside agriculture, and the assumption of fixity of supply was not viewed as a limiting case of the infinite array of possible supply elasticities. Despite his penchant for abstract analysis, Ricardo was not a formalist: he was a theorist who wished to answer definite questions (presented by economic problems), and he made his theory no more general than these questions required.

### III. THE RICARDIAN THEORY

In the theories of population and rent, as we have seen, Ricardo was chiefly a borrower, and he did not improve upon either theory in any basic respect. In the synthesis of these theories into a general theory of value and distribution, he struck out on his own. The peculiar combination of doctrines that makes up his system is truly original.

The outlines of his theory were beginning to emerge in his *Essay on the Influence of a Low Price of Corn on the Profits*

[66] He believed that improvements had little effect on the shape of the marginal product curve (*Principles*, pp. 412–13).

[67] *Ibid.*, pp. 79–80, 412.

[68] Clearer notice of long-run effects was taken in the third edition, in answer to Malthus' criticisms (*ibid.*, pp. 81 n., 335–36).

[69] *Ibid.*, p. 44; see, however, p. 261 n.

[70] *Nature and Progress of Rent*, p. 17.

[71] *Wealth of Nations*, Book I, chap. xi.

*of Stock* (1815). We shall sketch the main elements of this theory before we turn to the *Principles*. The argument rested upon four propositions:

First, in the (domestic) production of corn, there is diminishing returns to composite dose of capital-and-labor. What is the dose of capital-and-labor? Strictly speaking, it is a dose of capital, and this capital consists of fixed capital (buildings, machinery, etc.) and circulating capital (the advances to laborers). The amount of circulating capital is set by the amount of labor (which is in fixed proportion to the fixed capital), and the wage rate.[72]

Second, the return to this dose of capital (and labor) is equal to the marginal product—cost of production equals price.

Third, the return on capital in agriculture fixes the rate of return that must also be obtained in other industries.[73]

Ricardo defended this amazing proposition as follows: Given the population, the demand for food is fixed in amount. Unless population changes, the output of corn will not change, and therefore—in the absence of technological improvements in agriculture—the investment in agriculture is fixed. Competition will not allow two profit rates; hence the profit rate in nonagricultural industries must equal that in agriculture.

This is a violent sequence. If new inventions raise the profit rate in manufactures, how is it restored to the agricultural rate? The internally consistent reply for Ricardo to make would have been: With an absolutely inelastic demand for corn, the attempt of capital to leave agriculture would force up the price of corn and hence the profit rate in agriculture until it equaled the profit rate in manufactures. But this is the reverse of Ricardo's conclusion; he argued, instead, that the profit rate in manufactures would fall back to the agricultural rate, as capital flowed into manufactures.[74]

A somewhat more comprehensible explanation can be inferred from his letters to Malthus. Innovations in nonagricultural industries will have no effect upon the cost of subsistence and hence upon wages (Ricardo temporarily forgot that other things besides food enter the worker's budget). Profits can be high for a short time (say five years), but soon the effects of the innovations will be overcome by the accumulation of capital. The only persistent force, working to lower profits, is diminishing returns in agriculture.[75] This proposition was not advanced in the *Principles*.

Fourth, the rent of land will be equal to the total product minus the amount of agricultural capital times its profit rate.

This is not a complete system because, in the absence of more explicit theories of population and capital accumulation, the aggregate output of the economy is not determined. The system does determine the division of product between landlords and others, but not between capitalists and laborers. Ricardo avoided this latter problem (although the subsistence wage theory lurked in the background). He denied, in fact, that the division between wages and profits was determinate:

> As experience demonstrates that capital and population alternately take the lead, and wages in consequence are liberal or scanty, nothing can be positively laid down, respecting profits, as far as wages are concerned.[76]

The *Essay* thus contained two main elements of the Ricardian system: the

[72] *The Works and Correspondence of David Ricardo*, ed. Sraffa and Dobb (Cambridge, 1951), IV, 10–11.

[73] *Ibid.*, pp. 13 n., 23–24.

[74] *Works*, IV, 24.

[75] *Letters*, pp. 43, 46, 52, 57.

[76] *Works*, IV, 23.

theory of rent and the dominant influence of diminishing returns in agriculture upon the rate of profits. The completed system required two further elements: the subsistence theory of wages and the measure of value. These were presented in the *Principles*, to which we now turn. Neither the organization nor the exposition is very felicitous, and I shall restate the central argument in my own words.

The competitive firm sells its product at a price which, on the average, equals its cost of production.[77] These costs of production are the various outlays of the entrepreneur on productive services; but from the social viewpoint one class of costs is pure transfer payments, which are unnecessary to call forth the (fixed quantity of) productive services. These transfer payments are the rents paid for the use of land, and they can be eliminated from consideration by discussing costs at the extensive or intensive no-rent margins.

The various outlays of the entrepreneur are bewilderingly numerous, and they must be aggregated into fewer classes if useful generalizations are to be made. Let us classify all expenditures in two classes: fixed capital and circulating capital. Circulating capital is used up in a short time—say a year or less; fixed capital is the remainder.[78] The chief employment of circulating capital is advances of wages to laborers.[79]

The wages of labor are also diverse, varying with skill, cost of education, and the like. Yet the occupational wage structure is very stable, so we may treat a skilled laborer as (say) three unskilled laborers if the former's wage is three times that of unskilled labor. Thus the expenditure on wages may be taken as proportional to the number of "equivalent unskilled" laborers.[80] (Ricardo should also have specified that the occupational structure of laborers is stable.)

Let us turn now to fixed capital—machines, buildings, and other durable equipment. Here we face a double problem: the machines are of very different durabilities; and the value of machines per worker varies widely among industries. Therefore, a rise in wages relative to interest (profits) will raise the prices of goods made with little fixed capital or with capital of short life, relative to the prices of goods in which more, and more durable, fixed capital is used.[81] But for broad purposes this refinement is not important: "The reader . . . should remark, that this cause of the variation of [relative values of] commodities is comparatively slight in its effects."[82] It is unimportant because the relative prices of labor and capital can vary little, whereas the quantities of labor necessary to produce various commodities can undergo large changes. (He should also have specified that the ratio of fixed capital to wage payments cannot undergo large changes.)

As a corollary of this theory of value, there exists no perfect measure of value, i.e., a measure of value independent of the fluctuations of wage and profit rates. The varying proportions of fixed to circulating capital and the varying durability of fixed capital imply that, given a change in the ratio of wage rates to prof-

[77] ". . . We mean always such commodities . . . on the production of which competition operates without restraint" (*Principles*, p. 12).

[78] *Ibid.*, p. 31.

[79] "In one trade very little capital may be employed as circulating capital, that is to say in the support of labour . . ." (*ibid.*, p. 32). The other use of circulating capital is presumably to purchase raw materials, whose costs are, in turn, resolvable into rent or payments for fixed or circulating capital.

[80] *Ibid.*, chap. i, sec. 2.

[81] *Ibid.*, secs. 4 and 5. The period of turnover of circulating capital is also recognized as a factor in the effects of wage changes.

[82] *Ibid.*, p. 29; *Letters to Malthus*, p. 176.

it rates, the values of goods will change differently, depending on the choice of the commodity used to measure their values.[83] But find a commodity which is produced with an average ratio of labor to capital (and this of average durability), then the ideal measure will be approximated.[84] Assume we have found such a near-ideal measure of value—the amount of labor (and corresponding amount of fixed capital) necessary to produce, say, gold.

Ricardo can now solve his basic problem: the distribution of the total produce among the various productive factors. Let us begin with the situation where 10 men on a given farm produce 180 bushels of corn.[85] This corn sells for $1 in terms of the measure of value, that is, the production of a bushel of corn requires the same quantity of capital and labor as the production of the quantity of gold designated as $1. Moreover, let each worker receive a subsistence wage of 5 bushels plus $5 of other necessaries. (We quote these other necessaries in value terms because their production is subject to constant costs.) We may summarize the situation (Table 1).

TABLE 1

| | |
|---|---|
| Value of product = 180 × $1 | = $180 |
| Wage rate = 5 × $1 + $5 | = 10 |
| Wage bill = 10 × $10 | = 100 |
| Total profits = $180 − $100 | = 80 |
| Rent | = 0 |

Now, with the progress of capital and population, resort must be had to Grade II land, on which 10 men (and corresponding capital) produce 170 bushels. The price of wheat must rise to 18/17 = $1.0588 per bushel, because the quantity of labor (and capital) per bushel has risen in this proportion relative to the ideal standard. The new situation is as shown in Table 2. (Recall that the rate of profits on marginal land sets the rate obtainable on superior land.) We could continue the arithmetic, but we have already reached the great conclusion: With the growth of population, the rate of wages rises, the rate of profit falls, and aggregate rents rise—all in terms of the measure of value.

TABLE 2

| | Grade I Land | Grade II Land |
|---|---|---|
| Value of product | 180×$1.0588= $190.58 | 170×$1.0588= $180.00 |
| Wage bill* | 102.94 | 102.94 |
| Profits | 77.06 | 77.06 |
| Rent | 10.58 | 0 |

* The wage rate is 5×$1.0588+$5=$10.294.

Ricardo's basic theorem on distribution—"a rise of wages . . . would invariably lower profits"[86]—is thus strictly dependent on his measure of value. The product of a given quantity of capital and labor, be it large or small, always has the same value; hence the larger the value of labor (wages), the smaller will be the value of capital (profits). This is not equivalent to the proposition that a rise in wages will lead to a fall in the share of total income received by capitalists, for Ricardo had no theory of the share of total income going as rent.

Ricardo argues, almost parenthetically, that under certain conditions the inverse relationship between wages and profits holds also when they are expressed in terms of ordinary money rather than in an ideal standard. If a country

[83] Commodities made with relatively much labor will rise in relative price when wage rates rise relative to profit rates.

[84] *Principles*, pp. 44–45. For a discussion of the measure of value in the first edition, see *ibid.*, pp. xlii ff.

[85] *Ibid.*, pp. 112 ff.

[86] *Ibid.*, p. 127.

is on the gold standard, its price level cannot vary (much) because of changes in domestic factor prices; gold flows will soon restore its former level. If, further, the productivity of capital and labor do not change, a rise in money wages will lead to a fall of money profits—in no other way can international monetary equilibrium be restored.[87]

One could criticize Ricardo's theory on many grounds. The population was not at a subsistence level, the occupational structure of the labor force and the relative wage structure were not stable, improvements in agricultural technology were neither negligible nor sporadic, technological progress in nonagricultural industries could offset diminishing returns in agriculture, etc. Malthus, however, concentrated his criticisms chiefly on one point: the ratio of circulating to fixed capital varies greatly among industries, and this fact vitiates Ricardo's measure of value. Extreme examples were adduced to demonstrate this: wine (and oak trees) increase in value without any direct labor expenditures (circulating capital); shrimp may be collected on the seashore without any fixed capital.[88]

This was a serious ambiguity, as Ricardo frankly recognized. Suppose corn is produced with much labor and little fixed capital, whereas the ideal commodity used to measure value is produced with a lower ratio of labor to fixed capital. Then diminishing returns in agriculture no longer entail a proportional rise in the value of corn (in terms of the ideal commodity), and, in fact, there is no method of determining how much the value of corn will rise. Ricardo would have had to introduce variable proportions between labor and fixed capital in each industry in order to cope with this problem, and this modification would have had radical consequences for his general system.

Ricardo summed up the general historical implications of this theory as follows:

> The natural tendency of profits then is to fall; for, in the progress of society and wealth, the additional quantity of food required is obtained by the sacrifice of more and more labour. This tendency, this gravitation as it were of profits, is happily checked at repeated intervals by the improvements in machinery, connected with the production of necessaries, as well as by discoveries in the science of agriculture which enable us to relinquish a portion of labour before required, and therefore to lower the price of the prime necessary of the labourer. The rise in the price of necessaries and in the wages of labour is however limited; for as soon as wages should be equal . . . to the whole receipts of the farmer, there must be an end to accumulation; for no capital can then yield any profit whatever, and no additional labour can be demanded, and consequently population will have reached its highest point. Long indeed before this period, the very low rate of profits will have arrested all accumulation, and almost the whole produce of the country, after paying the labourers, will be the property of the owners of land and the receivers of tithes and taxes.[89]

Depending on the relative strengths of technological progress and diminishing returns, the dismal stationary state lies near or far in the future—but in any case, it lies farther in the future with free trade in corn! Ricardo pays little attention to this final, historical equilibrium, so we are entitled to infer that he did not believe that it was near.

Although both Adam Smith and Ricardo had cost theories of value, there were important differences even in the basic principles, of which four may be noted here. First, Smith believed that population changes lagged behind changes in the quantity of capital; therefore,

[87] See *ibid.*, pp. 104–5, 126–27, 213–14; and *Works*, IV, 213–16.

[88] *Letters to Malthus*, pp. 179, 222.

[89] *Principles*, pp. 120–21.

wages were indefinitely above the subsistence level in an advancing society.[90] Second, the tenor of Smith's theory of rent, which was not given a coherent statement, was that aggregate rents are a residual but that the rent of any one use of land is a cost determined by the alternative uses of the land.[91] Ricardo ignored the multiplicity of uses of land. Third, Smith believed that the accumulation of capital led to a fall in the rate of profits,[92] whereas Ricardo—arguing from Say's law—denied that capital accumulation had any effect upon the rate of profits (unless the cost of food increased).[93] Finally, Smith's measure of value (ideally, money wages; as an approximation, corn prices) was designed to answer the same question as modern index numbers: how to eliminate differences in the value of money and thus ascertain the "real" changes. Ricardo's measure, on the other hand, was not a price deflator; it was designed to locate the source of changes in value in order to connect wages and profits to labor's and capital's shares in the national income minus rents.

Modern economics is closer to Smith's position than to Ricardo's on each of these differences, although in the case of rent we use Ricardo's technique to analyze Smith's problem. This is not surprising: Ricardo had neither Smith's genius for isolating fundamental empirical relationships nor his supreme common sense. Yet Ricardo was, in his own terrain of technical analysis, superior to Smith. We may illustrate this superiority by comparing the two men's analyses of the effects of a tax on agricultural profits.

[90] *Wealth of Nations* ("Modern Library" ed. [New York, 1937]), p. 69.

[91] *Ibid.*, Book I, chap. xi, esp. pp. 144–46, 149, 152, 159.

[92] *Ibid.*, pp. 87 ff.

[93] *Principles*, pp. 289–93.

Smith, after describing and criticizing the French *taille*, makes the following analysis:

> When a tax is imposed upon the profits of stock in a particular branch of trade, the traders are all careful to bring no more goods to market than what they can sell at a price sufficient to reimburse them for advancing the tax. Some of them withdraw a part of their stocks from the trade, and the market is more sparingly supplied than before. The price of the goods rises, and the final payment of the tax falls upon the consumer. But when a tax is imposed upon the profits of stock employed in agriculture, it is not the interest of the farmers to withdraw any part of their stock from that employment. Each farmer occupies a certain quantity of land, for which he pays rent. For the proper cultivation of this land a certain quantity of stock is necessary; and by withdrawing any part of this necessary quantity, the farmer is not likely to be more able to pay either the rent or the tax. . . . The farmer, however, must have his reasonable profit as well as every other dealer, otherwise he must give up the trade. After the imposition of a tax of this kind, he can get this reasonable profit only by paying less rent to the landlord.[94]

Smith does not explain why less land cannot be tilled; he does not explain how the threat of farmers to abandon farming will lower rents; nor does he explain why, if some farmers do leave the industry, the price of the product will not rise at the same time that rents fall.

Ricardo begins in a similar fashion:

> A partial tax on profits will raise the price of the commodity on which it falls: a tax, for example, on the profits of the hatter, would raise the price of hats; for if his profits were taxed, and not those of any other trade, his profits, unless he raised the price of his hats, would be below the general rate of profits, and he would quit his employment for another.[95]

The conclusion is generalized:

> If it be agreed, that by taxing the profits of one manufacturer only, the price of his goods would rise, to put him on an equality with all other manufacturers; and that by taxing the

[94] *Wealth of Nations*, p. 807.

[95] *Principles*, p. 205.

profits of two manufacturers, the prices of two descriptions of goods must rise, I do not see how it can be disputed, that by taxing the profits of all manufacturers, the prices of all goods would rise, provided the mine which supplied us with money, were in this country, and continued untaxed.[96]

Prices will rise in varying proportions because of the varying ratios of fixed capital to circulating capital, the varying durability of fixed capital, etc. Now consider the effect upon landlords of a tax on profits (1) in every industry except corn, (2) in every industry, and (3) in the industry growing corn only.[97] In the first case every price except that of corn would rise. The landlord's corn and money rents being unchanged, he would suffer a fall in real income. In the second case corn would also rise in price, and, since its output was constant (on the customary assumption of zero demand elasticity), money rents would rise correspondingly; so the landlord's rent would retain its full purchasing power. In the third case money rents would rise, and real rents would therefore also rise.

Ricardo's analysis is perhaps little more rigorous than Smith's—for example, in the first case it is difficult to believe that profits in agriculture would not fall. Yet Ricardo's analysis is more consistent with his general theoretical system, and it is more subtle and systematic. It is perhaps worth adding, however, that the landlord who accepted Smith's opinion in preference to Ricardo's and opposed a tax on (and especially a tax only on) agricultural profits would be taking better care of his interests.

I shall not go further with the applications that Ricardo makes of his theory to taxation, currency, international trade, and in his polemics with other economists. These applications are not impeccable—for example, the celebrated chapter on machinery rests upon a logical error[98]—but they were made with rare consistency. Much of the appeal of the Ricardian system must have come from these demonstrations of the certainty, almost the routine, with which it seemed to dispose of troublesome problems and opinions. The age of formulas had begun.

[96] *Ibid.*, p. 213.

[97] *Ibid.*, pp. 210–13.

## IV. CONCLUSION

The legendary figure of Ricardo as a stern logician and a powerful debater is, I think, correct in essentials. I should prefer to say that his logic was severe in its simplifications rather than superlative in its rigor, but the dominant characteristic of the man was undoubtedly his perseverance and consistency in dealing with a few basic ideas.

Economics is the body of substantive generalizations on the workings of economic systems. Ricardo did not enlarge much this body of knowledge: his one addition to Smith's work was the systematic, though only partial, recognition of diminishing returns. Perhaps no other economist has ever fully shared Smith's immense understanding of the forces that govern the structure and development of economies; certainly Ricardo was not distinguished for his ability to discover great inductive generalizations.

Economics is also an engine of analysis, and Ricardo, with his great powers of abstraction and synthesis, was a master-analyst. Population, natural resources, capital accumulation, and the distribution of income—these were woven into a sweeping theoretical system. Measured by the significance of the variables and

[98] Ricardo tacitly assumes that workers displaced by a technological advance cannot be employed elsewhere; for a good analysis see K. Wicksell, *Lectures on Political Economy* (London, 1934), I, 133–41.

the manageability of the system, he fashioned what is probably the most impressive of all models in economic analysis.

It is here that Ricardo's service to economics lies. His naked logic and pseudologic helped to establish a professional frame of mind which did much to reduce promiscuous fact-gathering and *ad hoc* theorizing and to incite order and precision. This was the basic "Ricardo effect"; and, even with our modern knowledge of the painful extremes to which it can be carried, we must thank him for it.