27
Knight: Nemesis from the Chicago School

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Frank Hyneman Knight (1885–1972) was one of the most influential economists of the twentieth century. He received his Ph.D. in economics from Cornell in 1916, under the guidance of Allyn A. Young. He taught at the University of Iowa, Cornell, and the University of Chicago, where he was Martin D. Hull Distinguished Service Professor and one of the founders of the "Chicago School" of economics. Among his students were such famous economists as James Buchanan, Milton Friedman, and George Stigler. During the 1930s, he was one of the editors of the *Journal of Political Economy*, and he became the president of the American Economic Association in 1950. In 1957, he was awarded the Francis Walker medal, which is awarded every five years to the "living American economist who has made the greatest contribution to economics."

Knight was a man of forceful disposition, with opinions strongly held, bluntly expressed, and tenaciously retained. One of these opinions was hostility to Georgism. This hostility, however, did not extend to personal relationships—as witnessed by his gratuitous offer to nominate a Georgist, Harry Gunnison Brown, to the presidency of the American Economic Association.

Knight's most famous contribution to economics, developed in his 1921 book *Risk, Uncertainty and Profit*,[1] concerns the difference between "risk" and "uncertainty." As he defined these terms, "risk" is concerned with known probabilities and can be dealt with through pooling and insurance, while "uncertainty" is concerned with unknown probabilities and is the source of true economic profit.[2]

Besides being a widely respected economist, Knight was also a social philosopher who strongly believed in individual freedom and opposed all forms of social engineering. In a famous 1924 article,[3] he responded to Arthur Pigou's claim that road congestion justifies taxes on roads users. Knight argued that such congestion is a result of the

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absence of property rights in roads. The assignment of property rights, Knight asserted, would induce owners of congested roads to demand tolls from travelers, yielding the same efficient allocation of road space as taxation. This insight laid the foundation for James Buchanan's and Ronald Coase's famous analyses of property rights.

Knight did not believe that unregulated markets had the ethical merit that some economists have claimed. In a 1923 article on the "Ethics of Competition,"[4] he agreed that competitive markets allocate resources efficiently and that they reward every market participant according to the value of his marginal contribution to output. However, he argued, not only are real markets unlikely to meet the assumptions that are necessary for competition to yield the theoretically predicted outcome, but it is also impossible to conclude that any ethical implications are embedded in the theory of competition.[5] The only justification of competition is that "it is effective to get things done; but any candid answer to the question, 'what things,' compels the admission that they leave much to be desired."[6]

While rejecting an ethical defense of markets, Knight still defended laissez-faire because he considered it impossible to preserve individual freedom when governments have great power. In a public lecture at the University of Chicago in 1944, he said:

> Extensive positive action as a unit by a large group, defined by residence in a contiguous area, means delegation of power to a limited number of officials, politicians and bureaucrats. If this is done on an extensive scale, as it is done by planners and "neo-liberals," the agent cannot be held responsible for the use of power, even to a technical majority of those for whom he acts. Such grants of power tend to become irrevocable and the power itself tends to grow beyond assignable bounds.[7]

This distrust of extensive government power may have been at the root of Knight's negative position on the single tax. It is possible that Knight regarded George's call for government action to rectify the ethical problem posed by the private appropriation of rent as just another utopian call for social planning. On at least one occasion, he characterized the single tax as "socialist" confiscation.[8] But Knight's main argument against the single tax was his claim that there is no conceptual difference between rent and interest, and that "pure land value" simply does not exist. A tax on land value, he believed, would lead to the same inefficiencies as a tax on capital.

Knight's View of Land as a Factor of Production

To understand Knight's argument, we must establish what he meant by "pure land value." This is not an easy task because of Knight's elliptical writing style. However, a reasonable inference can be developed from Knight's view of factors of production, which differed notably from the view of classical economists.

Classical economists divided the factors of production into land, labor, and capital. "Land" was defined as everything that had not been produced by human effort. Human beings were classified as "labor." "Capital" was defined as everything that had been produced by human effort, except human beings. This division implies that the supply of land is fixed (or "inelastic"), while the supplies of human labor and capital are variable (or "elastic"). Labor supply can be increased either by producing offspring or by working more or harder, and the supply of capital can be increased by investment.

Knight found such a division useless. He argued that, while it might be possible to divide hypothetical productive factors according to their conditions of supply, such an exercise would be irrelevant for the productive factors that actually exist.[9] All factors of production should logically be classified as "capital," because the supply of every factor can be regarded as the result of past investment.[10] Labor supply, for example, can be regarded as the outcome of an investment choice in either additional training or additional children. Similarly, Knight argued, land is produced by investment in exploration and development:

> Capital goods in fact differ widely in the length of time required to adjust supply to changes in demand. If there are any agencies not subject to reproduction through investment at all, they conform to the classical description of land. It is the writer's view that such agents are practically negligible and that in the long run land is like any other capital good. Investment in exploration and development work competes with investment in other fields and is similar in all essential respects to other production costs. The distinction between goods relatively flexible and those

> relatively inflexible in supply and the recognition of a special category of income (Marshall's "quasi-rent") for the latter is possibly expedient. With uncertainty absent such a distinction is, of course, irrelevant.[11]

From Knight's perspective, the classical notion that land is not produced "reflects a false conception of production."[12] He wrote:

> Production was defined as production of wealth. But in fact, primary production consists in the rendering of services. Wealth is an agency by which services are rendered, not a product in the primary sense. . . . Wealth axiomatically is produced either to replace some item which is used up in rendering its service or to add to the total stock of service rendering agencies. . . . The use of the new wealth increment . . . constitutes production of services simultaneously rendered; and the same services cannot be produced twice.[13]

In other words, Knight believed that the idea that land was not produced confused the concepts of stocks and flows. Economic production, he maintained, refers not to physical creation (as of the earth, a stock), but rather to the transformation (a flow) of inputs into outputs. Although the earth was obviously not created through human effort, Knight assumed that it would not render any services until human activity (production) had transformed it into useful (economic) land.

How does one produce land? From Knight's point of view, the production of land ("opportunities") consisted of the appropriation of an undeveloped resource as well as the transformation of the undeveloped resource into a productive factor. He wrote:

> [I]n real life, the original "appropriation" of such opportunities by private owners involves investment in exploration, in detailed investigation and appraisal by trial and error of the findings, in development work of many kinds necessary to secure and market a product—besides the cost of buying off or killing or driving off previous claimants.[14]

For example, the transformation of soil located below sea level into useful land requires the decision that such transformation is economically feasible ("investment in exploration, in detailed investigation and appraisal by trial and error of the findings" [call this "Cost category 1"]), the effort to ensure exclusive access to the area ("the cost of buying off or killing or driving off previous claimants" ["Cost category 2"]), as well as the actual transformation ("development work of many kinds necessary to secure and market a product" ["Cost category 3"]).

If the transformation of undeveloped resources into land yields something valuable, then the "production" of land will become attractive as soon as the land's value equals the value of the funds that must be used in its production. It is not necessary that the transformation of resources into land lead to positive costs in all three categories. Even if there are no exploration and development costs, somebody will find it worthwhile to spend funds (Cost category 2) to ensure that he receives exclusive access to the resource if such exclusive access is valuable. Competition would induce developers as a group to spend an amount equal to the value of the land in the attempt to secure exclusive access to the undeveloped resources.[15] Knight would consider this struggle to secure exclusive access to be an example of the production of land.[16]

If markets are competitive, then production does not create new value but simply transforms inputs into outputs of equal value. It follows that the value of land is equal to the value of the funds that have been spent in its production. Thus Knight concluded that "[p]ure land value in the sense assumed by the advocates of the single tax does not exist,"[17] and this conclusion provided the foundation of his rejection of the single tax:

> [T]his dogma of unconditional fixity of supply was made the basis for the single-tax propaganda. We cannot discuss this position at length, but must take space to remark quite briefly that it is utterly fallacious. It should be self-evident that when the discovery, appropriation, and development of new natural resources is an open, competitive game, there is unlikely to be any difference between the returns from resources put to this use and those put to any other. Moreover, any disparity which exists is either a result of chance and as likely to be in the favor of one field as the other, or else is due to some difference in psychological appeal between the fields; i.e., goes to offset some other difference in their net advantages. Viewing as a whole the historic process by which land is made available for productive employment, it must be said to be "produced"; i.e., to have its utility conferred upon it in a way quite on a par with that which holds for any other exchangeable good.[18]

If one were to accept Knight's conception of land, then his critique of the single tax might be acceptable.[19] But Knight's treatment of all factors of production as capital ignores a difference between the ways original property rights in capital and land are established. This difference leads to inefficiency if original property rights in land are established through competition, and it motivates the separation of land and capital into different factors.

The usefulness of Knight's conception of land depends on the claim that the three cost categories of land production are equivalent to the three costs categories of capital production. If one accepts Knight's view that land development counts as part of land, then Categories 1 (investigation) and 3 (transformation) apply to the production of land and capital in the same way. Costs in Category 2 (securing exclusive access), however, require a more detailed analysis. Category 2 costs may arise in two different circumstances: they arise first in the context of the original establishment of property rights, and second in the context of the transfer of already established property rights. Costs related to the transfer of already established property rights may arise for any transferable good, and therefore for capital as well as for land. But the costs of establishing original property rights in land and capital differ in most societies.

How does one establish original property rights in factors of production? Many societies recognize a difference between the original establishment of property rights in labor and in capital. Frank Knight referred to this recognition when he wrote:

> From the standpoint of causality, the productive capacity in one's person is generally the result, more or less, of activity on his own part, which has, more or less, the character of investment, and, in addition, every human being is originally "created" by the use of "resources" belonging to other persons . . .
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> But all this does not mean that the human being as a source of economic services can be treated in theory as wealth or capital, or additions to human productive capacity treated as product, or the act of making them as production, as in the case of material wealth. There is a fundamental difference, in the form of a somewhat paradoxical limitation to the individual's ownership of himself. The principle of inalienable rights, recognized in all free societies, means not merely that one cannot sell himself outright, but that one cannot so much as give a valid lien on his services or make an enforceable contract to deliver them for any considerable time

> in the future. In other words, he cannot capitalize his earning capacity. Having no economic value to anyone but himself, he has in effect none at all.[20]

Although it would be possible to develop economic theories that are based on an individual's ability to capitalize his own earning capacity, the predictions of such theories would have little relevance to actual societies that recognize inalienable rights. Thus it seems necessary for economic analyses to acknowledge the existence of social conventions.[21]

In many societies, original ownership in produced things is established through legal ownership of the factor services that produced the things. If one does not want to evoke theories of natural rights, then one might defend such a convention on the basis of accepted notions of fairness or efficiency. Again, it seems necessary that economic theory take such conventions into account because the accepted rule of establishing ownership in produced things directly affects the implications that one can draw from a theory of investment.[22]

In Frank Knight's framework, the effort that is used to secure exclusive access to nonproduced resources is part of the production of land. In societies in which produced things belong to their producers, Knight's conception of land thus provides an explanation of the establishment of original property rights in land. His conception of land seems appropriate because the value of the effort to secure exclusive access is a true cost for the person who appropriates the resource. However, funds that are used to acquire property rights are wasted from a social point of view because their only purpose is to ensure that one person rather than another obtains exclusive access. It would be possible to achieve the same outcome by simply granting one person exclusive access to the resource. Combining land and capital into a single category obscures this fact, and makes it difficult to notice that the original acquisition of property rights can entail social inefficiency.

Instead of assuming that land and capital are indistinguishable, it is more appropriate to maintain the classical separation of factors of production into land, labor, and capital. But now the classical separation acquires a new meaning, because factors are defined in terms of ways of establishing original property rights. Human beings, who own themselves and whose ownership is inalienable, are classified as "labor." Things that are not human beings but came into existence through human effort and are therefore owned by their producers are classified as "capital." Everything else is classified as "land." According to this definition, land is the same as an unimproved natural resource, and the value of a plot of land is the highest amount someone would be willing to pay to obtain exclusive access to it (Cost category 2) if it were unimproved.[23] Land investigation and development (Cost categories 1 and 3) produce capital but do not affect the value of the land itself.[24]

Unlike Knight's conception of land, the new (or old) conception does not suggest an immediate solution to the problem of establishing original ownership. However, it emphasizes that any effort that is made to establish original ownership in land represents a waste of resources from a social point of view. A community is free to adopt any convention for the establishment of ownership in land. The single tax is an example of a convention that leads to social efficiency. It requires that the community be permitted to impose a tax on land that is privately owned. Thus the community would charge the developers of new resources a fee (or impose a tax) equal to the maximum amount anybody else would be willing to pay for exclusive access to the resource. In competitive equilibrium, nobody will receive any special profit from the resource, but the community will have the proceeds of the fee.[25]

It is interesting to note that Frank Knight was among the first economists who addressed the social benefits of private property rights. In his discussion of Arthur Pigou's analysis of social costs,[26] Knight argued that, in the absence of owners who control access to their property, users of land have an incentive to disregard the congestion costs that they might impose on others. The result is an inefficiently intensive use of the land. If land is privately owned, then owners have an incentive to charge a fee that limits land use to the socially optimal level.

It seems to be only a small step to extend this notion to the acquisition of land itself. However, Frank Knight declined to make this extension. In a footnote to the paragraph in which he explained the benefit of private ownership of land (or "opportunities"), he wrote:

> The relation between "investment" and "opportunity" is an interesting question, by no means so simple as it is commonly assumed to be. In the writer's view there is little basis for the common distinction in this regard between "natural resources" and labour or capital. The qualities of real significance for economic theory are the conditions of supply and the degree of fluidity or its opposite, specialization to a particular use. In a critical examination neither attribute forms a basis for erecting natural agents into a separate class.[27]

We can only speculate as to why Knight did not apply his analysis of property rights to the acquisition of land. It is possible that he did not consider this to be a "small step." When Pigou claimed that road congestion justifies taxation of roads users, Knight showed that the establishment of property rights restores market efficiency and removes the need for government intervention for the "social good." The single tax, on the other hand, requires government intervention to resolve a market failure. Even though in both cases the problem results from missing property rights, the remedies that restore overall efficiency are the exact opposites of each other. Knight did not believe that it would be possible to maintain individual freedom in the presence of a powerful government, and he might have thought that the danger of assigning additional power to the government would outweigh the potential benefit of the single tax.

An alternative explanation for Frank Knight's failure to apply his analysis of property rights to the acquisition of land is that his conception of land may have prevented him from recognizing that Category 2 costs have different efficiency implications for natural resources and for capital. He repeatedly emphasized that the "production" of land yields the same return as other investments, and his main argument against the single tax seems to have been that, because the production of land does not yield a profit if markets are competitive, there is no unearned increment to which the single tax could be applied.[28] It is at least possible that he did not realize that the single tax is not levied on any profit that may be made from developing the land, but rather on the value that is dissipated by costs in Category 2.

Knight's View of the Ethics of Private Ownership in Factors of Production

The discussion of Knight's conception of land and his rejection of the single tax emphasized the positive argument for adopting a tax (interpreted as a user fee) on the use of natural resources: such a tax improves upon the market outcome by restoring social efficiency. But Henry George's main motivation for proposing a *single* tax on land was derived from a normative argument: land belongs to everybody in society, and private appropriation of rent is therefore morally wrong. Humans belong to themselves and capital belongs to the person who produces it, which implies that public appropriation of portions of wages and interest through taxation is morally wrong as well. What was Frank Knight's view on the ethics of private ownership of land, labor, and capital?

Throughout his life, Frank Knight very eloquently defended the position that economic theory and ethics belong to separate realms,[29] and he was suspicious of economists who advocated government action for ethical reasons. Whenever he addressed claims that individuals are not entitled to the returns of productive agents in their possession, he attempted to show that there is no fundamental difference between the returns of different productive agents. If no such difference exists, he argued, then it is illogical to single out the returns to a particular agent—one can only claim that individuals are either entitled to the returns of all agents or to no returns at all.

Knight explained his position most forcefully in his analysis of socialism:[30]

> The ethical questions as to whether an individual deserves to receive and enjoy the income produced by any productive capacity in his possession may be divided into two parts. The first has to do with the source of the economic power in question, or how the individual comes into possession of it, and the second with the manner or conditions of its use. In both cases—property in the narrow sense and personal capacities—possession originates in a similar list of facts and processes. These include,

> in both cases, first, inheritance, and second, the working of social-cultural and legal processes over which the individual has no control. Beyond this causally given basis or nucleus, productive power is created in the individual by a process of investment—in education and training in the inclusive sense—which is neither economically nor ethically different in any respect from the investment which gives rise to any other productive agency. All these factors are affected to a large if not overwhelming extent by all sorts of imponderables and contingencies which may be lumped under the head of "luck."
>
> There is no visible reason why anyone is more or less entitled to the earnings of inherited personal capacities than to those of inherited property in any other form; and similarly as to capacity resulting from impersonal social processes and accidents, which affect both classes of capacity indifferently. And in so far as the creation of either form of capacity is due to motivated human activity on the part of the individual concerned or his parents, or to anyone else, the motives may in either case be ethical or unethical in any possible sense or degree. And finally, the use of productive capacity of either type may similarly be more or less intelligently motivated in accord with ends or ideals which are ethical or unethical in any degree and in any meaning.[31]

Knight's position follows from his understanding that all productive agents ought to be defined as capital, because all are the result of some activity (the transformation of inputs into outputs, called "production") in the past. But past activity alone is not sufficient to answer ethical questions regarding the right to the returns of productive factors. For example, one might argue that Knight's argument:

> productive power is created in the individual by a process of investment—in education and training in the inclusive sense—which is neither economically nor ethically different in any respect from the investment which gives rise to any other productive agency

is inconsistent with respect to a person's socially accepted rights to his labor earnings. To the extent that personal capacities result from the activities of a person's parents, it would be consistent to assign the income that results from such "investment" to the parents rather than to the child. Instead, society has decided to assign such income to the child, which may be regarded as the result of "the working of social-cultural and legal processes over which the individual has no control." However, such a catchall phrase does not answer ethical questions at all because any assignment of rights can be "explained" or "defended" by the "working of social-cultural and legal processes." Instead, it is important to be aware of the implications and origins of such processes, and to understand how they form the ethical framework that a society has adopted. Even if Knight had made a convincing argument that there is no fundamental mechanical difference between the returns of different productive agents, the example suggests that such an argument may not be not very helpful to answer ethical questions of entitlement. It may be best to follow Knight's own suggestion and not to mix economic and ethical arguments.

Two Occasions to Ridicule Henry George's Philosophy and to Object to the Single Tax

Frank Knight argued against the soundness of the economic foundations of the single tax in several of his academic articles, and he criticized Henry George's ideas directly in two of his writings: a 1933 review of George Geiger's, *The Philosophy of Henry George*,[32] and a 1953 article titled, "The Fallacies in the Single Tax."[33]

The review of Geiger has the form of a diatribe against George and does not contain much of an argument.[34] Knight briefly repeated his earlier criticism that an investment in land can be expected to yield the same return as any other investment, but he did not add a reference to his theory of production; he probably thought that he had made his point already in 1921.

Frank Knight's most detailed account of his view of the single tax appears in the 1953 article. In addition to his earlier argument that the idea of the single tax is fallacious because investment in exploration and land development does not yield higher returns than investment in other activities, Knight raised eight other objections against the single tax. Two of his objections question the practical feasibility of implementing a tax on land, while the remaining objections are directed against the theoretical and ethical motivations of the single tax.

Objections Regarding the Practical Feasibilily of the Single Tax

Knight's first objection is concerned with what he saw as an unsolvable practical problem:

> If "society" means all mankind, treated equally, we must assume an all-wise, all-powerful, and completely benevolent world government. But such "practical" difficulties are a small matter to a reformer "hipped" on a panacea for the world's ills.[35]

and:

> I have mentioned the practical question of *what* "society" would have the right to take the land value from private holders. The only answer that is at least defensible in terms of natural-rights premises is "mankind," "the world." And that is what the single-tax propagandists say. Since this is clearly and absurdly impossible, one can only guess at their actual meaning. If a superhuman agency were to confiscate any type of wealth and distribute it equally among all living human beings, it would be immediately dissipated and lost, with the demoralization of organized society everywhere. This fact is enough to destroy all reasoning from abstract rights and to make any sensible person realize that practical problems have to be solved in terms of expediency, the requirements for civilized living, and some hope for progress.[36]

Knight is right that acceptance of the idea that rent belongs equally to all persons implies that all humanity must be accorded equal rights to land. But this does not require world government. It is sufficient to have a world-wide shared understanding that any nation that claims exclusive access to more than its share of the gifts of nature has an obligation to pay into a fund that compensates the nations that thereby have less than their shares.[37]

Knight's second objection is also practical rather than theoretical:

> [I]t is a detail hardly worth noting that rent is not actually "paid" in the case of a man farming (or otherwise using) his own land, but it would be "there" just the same. More important, the amount paid or "imputed" in any case would be only an approximation to the theoretically correct figure. And for the same reasons, if it were to be appropriated by the government, some official, some "bureaucrat" with power, would have to appraise it—subject to error, prejudice and acute disagreement. Moreover, the levy would evidently have to be the estimated real value of the land for use in the most economical way. To collect such rent, the government would in practice have to compel the owner actually to use the land in the best way, hence to prescribe its use in some detail. Thus we already see that the advantage of taxation over socialization of management has practically disappeared.[38]

Once again, Knight is half right. The rent of land is observed as a market price only when an owner leases unimproved land, which is rare. A system of public collection of rent requires an assessment system, and assessments can be expected to be less than perfect. But the goal of assessment need not be to determine "the estimated real value of the land for use in the most economical way." If there is a difference between the value of a parcel in the use to which the person who values it most highly would put it and the value when used by the person who values it second most highly, then it is reasonable to base the tax on the second value. This is the "cost" of using the parcel in its most highly valued use. Thus a suitable target for the assessed rental value of each parcel is the value of the parcel to the person who values it second most highly.

The question of how an assessor might identify such a value is a complex question. It would not be possible to use sale prices, as occurs under current property taxes, because sale prices would tend toward zero and would be determined primarily by expected assessment errors as the share of rent taken in taxation approached 100 percent. But there are other devices. An assessor could purchase title to a cross-section of parcels with improvements of minimal value, demolish the improvements and auction the parcels, under a rule that the auction price would be the tax for the first year, and taxes in future years would be determined by similar auctions of nearby parcels. Prior to such auctions, an assessor could invite land specialists to participate in a contest to offer formulas that would predict the winning bids of such auctions as a function of location and other land characteristics. An assessor could contract with persons interested in land development to provide land with specified characteristics for development, if it became available. The prices in such option contracts would provide estimates of the rental value of parcels. Thus there are ways to assess the rental value of land when the government is seeking to collect the opportunity cost of using land. None of these ways requires the government to supervise the use of land. Knight's suggestion that such supervision would be required is without foundation.

Objections Against the Theoretical Foundations of the Single Tax

In his next two paragraphs, Knight takes up what he sees as the crucial error in land-value taxation:

> For the crucial error in the theory, however, we have to look further. The way anyone becomes a landlord and comes into possession of the "surplus" or the "unearned increment" of the sale value which is its capitalized worth, is to buy it from a previous owner. He will, of course, have to pay a price which includes any expected future increase in the capitalized yield. Land has "always," practically speaking, been private property, freely exchanged against other wealth—including human beings when these could be owned. Possession through inheritance also involves no distinction and need not be considered. (In fact, other advantages besides property are inherited, and raise the same ethical problem.) Thus the value alleged to be socially created is always paid for before it is received—as far as the parties most interested are able to predict its arising.
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> Following this sequence back through time, we come to the conditions of original exploration and settlement. The allegation that our pioneers got the land for nothing, robbing future generations of their rightful heritage, should not have to be met with argument. The whole doctrine was invented by city men living in comfort, not by men in contact with the facts as owners or renters. How many preachers of single-tax doctrine would care to live their lives and bring up their families under the conditions of the frontier, fight off the savages and other enemies, and occasionally be massacred, suffer the hardships, overcome the difficulties or succumb to them, do without the amenities of civilization, including medical attention for their families—for what the average pioneer got out of it? The question answers itself. Their heirs, near or remote, often got unearned wealth, but again that is not a sequel peculiar to land. Consequently, if society were later to confiscate land value, allowing retention only of "improvements" or their value, it would ignore the costs in bitter sacrifice and would arbitrarily discriminate between one set of property owners and another set, where there is no difference to justify this action.[39]

George's supporters can agree that the owners of title to land have generally paid for those titles. They can agree that the Europeans who first seized land from the Indians suffered great hardships. The point of disagreement is with Knight's claim that "if society were to later confiscate the land value, . . . it would . . . arbitrarily discriminate between one set of property owners and another set, where there is no difference to justify the action."

If the owner of the only taxicab company in a town were to endure hardship and sacrifice persuading the town council to pass a law prohibiting any new firms from entering the taxicab business in the town, one would expect the owner's hardship and sacrifice to be reflected in a higher value of his business. Still, neither the owner nor anyone who bought his business would have a reasonable complaint if a subsequent town council were to repeal the restrictive law. People should be free to enter the taxicab business if they wish. Anyone should be able to understand this. If a town council is so misguided that it restricts individual freedom to enter the taxicab business, no one can reasonably claim that subsequent councils have an obligation not to correct the earlier council's error. George's supporters see titles to land in a similar light.

George's supporters assert that all persons have equal rights to the gifts of nature. If there is land that has no value to anyone else (marginal land), then for as long as the land remains marginal, anyone may freely use as much as he or she wishes. If land that had previously been marginal comes to have scarcity value, anyone who wishes to continue to use the land incurs at that time an obligation to take account of the rights of others. Even if previous users endured hardship and sacrifice in establishing their use, they do not obtain special rights.

It may be objected that value is created by those who explore previously unexplored land and identify uses for it that would not otherwise be known. This value is compensated by a system that grants titles to first users and is not compensated when first users have no special rights. There are three replies. First, giving ownership rights to first users overcompensates them, leading to the inefficiency of a land rush. As Knight had pointed out, if it was possible to establish ownership in a natural resource by a specified unproductive sacrifice, someone could be expected to make that sacrifice as soon as it yielded a positive expected profit. Thus the value of natural opportunities tends to be dissipated by a rule granting ownership to first users. Second, justice does not necessarily yield efficiency. Correspondingly, a demonstration that a particular institution is inefficient does not prove that it is unjust. Finally, even if justice does not require that all creation of value be compensated, a community can choose to compensate discovers of new knowledge if it wishes. However, a community that wished to compensate explorers of new land efficiently would not want to compensate them with titles in perpetuity. That would be excessive because it would ignore the likelihood that eventually someone else would make the discovery if the actual discoverer did not. Efficient compensation for discovery would reward the discoverer with the increase in value from the fact that the discovery was made sooner than it otherwise would have been. Thus a society that taxes the rent of land and does not tax the income from capital does not "arbitrarily discriminate between one set of property owners and another set, where there is no difference to justify the action." The difference between the two sets of property owners that justifies the action is that the owners of capital have created or purchased the value of the capital, while the "owners" of land have undertaken to exclude others or purchased a right to exclude others from what ought to be everyone's common heritage. Even if original users created some value by discovering uses earlier than they otherwise would have been discovered, the time when such uses would have been discovered by someone else is almost certainly long past in almost all cases, and the discoverer did not have a claim in justice to be compensated in any case.

On the remaining one and a half pages of the article, Knight raises six additional arguments against the single tax. First, he claims that taxation of rent is an example of confiscation that would lower people's incentive to accumulate property:

> Of course there is a large element of luck in all exploration and development activities. Some did make very high returns on their outlay; others lost their all, and often health or life itself besides. If society proposes to confiscate the gains of the winners it must compensate the losers—or not only work arbitrary injustice but set a precedent that would warn anyone against undertaking risky ventures. This would at once force establishment of outright socialism or put a stop to all forward-looking activity.[40]

The arbitrary injustice component of this argument has already been addressed. As to setting a precedent, that depends on how the action is justified. If a society were to say, "Because you have made a very high return on your outlay, we will confiscate your gain," then this could indeed be expected to discourage people from undertaking risky ventures. However, if a society says, "You may keep all of the gains that you have accrued through your labor and through your investments in capital, however high those gains may be. But we will require you to compensate the rest of us for any exclusive access that you seek to maintain to a disproportionately large share of natural opportunities," then the only risky ventures that one would reasonably expect to discourage would be those directed at appropriating natural opportunities.

Second, Knight argues that most land is not indestructible, and therefore needs to be maintained:

> The value of agricultural land is accounted for largely by qualities that are not "indestructible," but have to be maintained at a cost to keep the land productive. Its original and indestructible qualities hardly enter into its value, after a short period of use, in which the fertility is "mined out"; during that time it is like depletable mineral deposits, which present special problems in the field of profit, but have nothing to do with the land value of the Single Taxers.[41]

Knight is right that some parts of land value can be "mined" away. Whether this occurs in an ordinary mine or in an agricultural field, it highlights an issue to which George's supporters need to attend. If land is taxed without regard to this fact, there will be an incentive for owners of land to mine away such advantages inefficiently rapidly, to save on future taxes. To counter the inefficiency and injustice of having people save on taxes by mining their land, a land tax needs to be combined with a severance tax, levied at a rate that charges landowners the present value of the future taxes saved by mining. Then there is no net incentive for inefficiently rapid or slow depletion of depletable opportunities provided by nature.

Third, Knight suggests that land speculation has an important economic purpose:

> Men do not hold land "speculatively" for an expected increase in value. This is a social service, tending to put ownership in the hands of those who know best how to handle the land so that the value will increase. And the familiar psychology of gambling makes speculation in general a losing business to the whole body of those who engage in it. They obvi-

ously do not need to keep it idle to get the increase, and do not, if there is a clear opening for remunerative use.[42]

Knight returns later to the theme of land speculation:

> A favorite, supposedly very practical argument is that a tax on land value will force idle land into use. It will not—unless unused land is taxed more than what is used, in relation to its potential value; and it does not so operate where the expedient has been tried. If land having value for use is not used by an owner it is because of uncertainty as to how it should be used, and waiting for the situation to clear up or develop. An owner naturally does not wish to make a heavy investment in fitting a plot for a use which does not promise amortization before some situation may require a different plan.[43]

Knight's meaning in the first two sentences of the first quotation is not clear. Is he saying that land speculation never occurs? That is so clearly untrue that one looks for another meaning in Knight's words. One expects a Chicago economist like Knight to acknowledge that holders of land will treat land in whatever ways they expect will earn them the greatest profits. What he might mean is that land is generally held by people who do not see themselves as land speculators, and the buying and selling of land that might look like speculation is necessary to put land in the hands of those who can use it most valuably. George's supporters agree that a free market in land titles is valuable and tends to put land in the hands of those who can use it best. But that does not mean that land speculation never occurs.[44]

The third sentence suggests that Knight would not defend land speculation. But that is not the issue. The question at issue is, is there land speculation, and how does land taxation affect land speculation?

The final sentence of the first quotation is qualified by the last two sentences of the second quotation. Sometimes landowners do need to keep land idle to profit from the increase in its value, as Knight explains in the second quotation. When the intensity with which land can profitably be used is rising rapidly, it can be worthwhile to leave land unused or used unintensively, to avoid the loss of future opportunities and the cost of premature disposal of the improvements associated with the less intensive use. Whether it is in fact consistent with maximization of the present value of the returns to land to keep it presently unused or used unintensively depends on future circumstances, and people have differing beliefs about these.

The person to whom a parcel of land is most valuable is often the person who has the most extreme belief about how rapidly its productivity will rise, in ways that others do not perceive.[45] If such persons are perpetually optimistic about the rise in land value that is about to occur, then it can be subjectively rational to postpone building improvements on land, year after year. The holding of land by such a person is land speculation, and such speculation occurs, even if, as Knight says, "the familiar psychology of gambling makes speculation in general a losing business to the whole body of those who engage in it." Land becomes concentrated in the hands of those who see the greatest value in refraining from using it, creating an artificial scarcity of land.

Land taxation reduces the profit from land speculation. If the rent of land were taxed away completely, land titles would have a selling price of zero and there could be no profit in land speculation. Holding land would be attractive only to those who wanted to use land. Any increase in land taxation reduces the profit from land speculation, thereby reducing the amount of land speculation and the consequent artificial scarcity of land.

Fourth, Knight takes note of the argument that the claim of landowners to compensation for the social appropriation of rent is parallel to the claim of slave owners to compensation for the freeing of slaves:

> But there are specific "arguments" for the social appropriation of ground rent which it may be interesting to consider briefly. The case is often represented as parallel to that of slavery. Since slavery was always "wrong," no one could ever get a just title to slave property, hence summary liberation was just. This is invalid on both counts, economically and ethically. On the one hand, slave-owning and the capture and marketing of slaves were carried on under competition. It is improbable that the individuals concerned ever made appreciably more out of the business than they could have had by using their labor and capital in ways that have continued to be treated as legitimate. And ethically, the society, which established and sanctioned slavery, was "to blame." By rights it should have borne—i.e., distributed—the loss to individuals when it changed its mind and condemned and abolished the institution.[46]

Knight's argument that slave owners received only ordinary returns on their investments in slaves is irrelevant to the ethical question. It is equivalent to his earlier argument that landowners earned only ordinary returns. The reason that it is appropriate to require both slave owners and landowners to bear the costs of not having foreseen the moral progress of their societies is that this gives them an incentive to apply their capacity for moral foresight to their investment decisions. If a person is fully insured against the possibility that society will realize that an activity that has been considered legitimate will one day be seen to be not legitimate, then that person has no economic incentive to seek to understand and anticipate the moral progress of society. The failure to understand that it is not possible for one human being to own another or that all persons have equal rights to the gifts of nature is a "moral accident." While spreading, as advocated by Knight, is one way of dealing with accident costs, we usually find it worthwhile to identify individuals who could have prevented accidents and assign the costs of accidents to them. If it were possible, one would want to assign substantial portions of the costs of slave owning or landowning to the persons who were most instrumental in devising those institutions. But those individuals are long dead, and it may not be possible to identify individuals living today who have assets deriving from those actions. Therefore we are left with identifying individuals alive at the time when institutions are changing, who could have helped to reduce the costs of slavery or landownership. From this perspective, the slave owners or the landowners are logical candidates. They could have perceived the moral difficulties with slave owning or landowning and changed their behavior. Each such action by an individual would tend to increase the differential return to the morally wanting activity. And the greater the differential return grew, the more likely it would be that others would perceive the moral problem with the activity. Assigning the costs of such moral accidents to the owners of the assets that have come to be understood to be illegitimate has the additional advantage, in the theory of assigning accident costs, that it saves on administrative costs.[47]

Fifth, Knight argues that it is impossible to give all persons equal rights to land:

> So, with respect to land, it is said that every human being has an absolute right to access to the earth, by which he must live. But everyone actually has this right, subject to competitive conditions, i.e., that he must pay for it what it is worth (which is less than it has cost). The alternative would be that he get the permission from some political agent of the government. And the simplest economic analysis shows that if the government wants to use its resources most productively, it would have to charge the users of land precisely the rent which tends to be fixed by market competition among private owners. Any attempt to give every person an unconditional right to the soil would establish anarchy, the war of all against all—and is of course not approximated by a confiscation and distribution of "rent" or its employment for "social ends."[48]

Knight's statement, "The alternative would be that he get the permission from some political agent of the government," is off-target. The existing system of land titles involves getting permission from the government, in that to own land you must have a land title issued by the government. George's supporters endorse the continuation of that system. In terms of legal theory, George's supporters propose that the rights of all to the soil be protected by a liability rule, while the right of holders of title would be protected by a property rule, subject to liability payments.[49] That is, there would be a continuation of the rights of the individual holders of title to land to use land as they saw fit (subject to liability payments in the form of taxes). The rights of all to the soil would be recognized as rights of those who have less than their shares of exclusive access to land, to receive compensation from those who have more than their shares. If everyone who has more than his or her share of land is required to compensate those who have less than their share, the selling price of land titles becomes approximately zero, so anyone who wants title to additional land can get it at a nominal price, subject to payment of taxes.

The question of whether the rent of land should be distributed or employed for social ends is a complex question. Three sources of land rent can be distinguished: nature, public services, and private activities on surrounding land. The component of land rent that comes from nature is the part to which all persons have equal rights. Still, if the citizens of a particular community wish to pool their income from this source and use it for public purposes, they do not infringe on the rights of anyone outside their community. The component of rent that comes from the provision of public services is the natural source of financing for public services. If people have similar tastes, public services produce benefits in limited areas, and labor and capital are mobile, then public services will increase rent by an amount equal to the value that the service provides.[50] The component of rent that comes from private activities on surrounding land is most efficiently employed in rewarding those activities, but communities have no obligation to use it for that purpose if they do not wish to do so.

Sixth, Knight objects to the idea that there is anything that might be called land monopoly:

> It is true again that many economists have called land a monopoly, and held that a monopolist charges all that the buyer can be forced to pay. But such ideas are nonsense, by whomsoever expressed.[51]

To respond to this argument, one must address the question of how the meanings of words are established. From its Greek origin, a monopoly is a market in which there is only one seller, and to monopolize is to arrange to be the only seller in a market. These meaning of monopoly and monopolize goes back at least to the 1500s.[52] But from early on, these words have had figurative meanings as well. "Monopoly" came to mean an arrangement of arbitrary and excessive prices. Thus in 1601 one finds, "Setting also price before hand of that which they sell, and of that which they will buy, and so committing open Monopoly."[53] Adam Smith wrote,

> The rent of the land, therefore, considered as the price paid for the use of the land, is naturally a monopoly price. It is not at all proportioned to what the landlord may have laid out upon the improvement of the land, or to what he can afford to take; but to what the farmer can afford to give.[54]

Smith used "monopoly price" in an established sense of a price not related to cost of production. "Monopolize" acquired the figurative meaning of "to obtain exclusive possession or control of, to get or keep entirely to oneself."[55] Thus in 1659 one finds, "Nor shall mute Fish, the Sea Monopolize."[56] When we speak of someone monopolizing a discussion, we mean that the person is appropriating for himself more than his rightful share of speaking time, leaving others with inadequate shares. Thus a person who expresses concern about land monopoly is not asserting that there is a single seller of land services. Such a person is saying that some persons are appropriating for themselves more than their rightful shares of exclusive access to land, leaving others with inadequate shares.

It might be objected that in economics at least, "monopoly" has the technical meaning of a market with a single seller, and economists should refrain from using "monopoly" in other senses. However, the quote from Adam Smith above makes it clear that this was not the understanding of the person whom many regard as the founder of economics. The technical meaning of "monopoly" probably came to the fore in economics with the publication of Alfred Marshall's *Principles of Economics* in 1890. Thus it might be reasonable to say that an economist who used the word "monopoly" at the time Knight was writing or since, in any sense other than its technical sense, would be unreasonably courting misunderstanding. But this is not a valid criticism of Henry George's use of the term "land monopoly," because the technical meaning of the term had not eclipsed the figurative meaning at the time that George was writing.

Concluding Remarks

How should one assess Frank Knight's objections against the single tax? His objection against the practical feasibility of the taxation of land value certainly requires attention. But economists have suggested solutions to many of the practical problems of taxing land value. Although it needs to be tested whether these solutions are feasible in practice, it would be premature at this point to reject land-value taxation purely on practical grounds. Imagine a proposal to introduce a sales tax or a capital gains tax if no such taxes had ever been levied. The amount of information that needs to be gathered to implement such taxes would seem (and is) enormous, and the possibilities to evade these taxes would seem (and are) high enough to require highly intrusive enforcement activities. In addition, such taxes lead to an inefficient allocation of resources by distorting people's incentives. In comparison, the practical difficulties of levying a nondistortive tax on visible and immobile land seem rather small. We do not find any of Frank Knight's theoretical objections against the single tax compelling. The only objection that we cannot dismiss is the possibility that the single tax may provide funds to and thereby increase the power of nonbenevolent governments. Even though Knight did not explicitly raise this objection, his writings suggest that it may have been on his mind. But this objection applies to every tax, and the possibility that governments might abuse the levied funds is one of the costs of permitting governments to correct market inefficiencies through taxation. A society must decide whether this cost outweighs the expected benefit of government action.

In concluding his article on the "Fallacies of the Single Tax," Frank Knight wrote:

> The heart of the matter is that the rental value of land, when not a payment for personal service or a return on investment, is a *profit* like any other, a speculative gain due to an unanalyzable mixture of foresight and "luck."[57]

He considered this the fundamental objection against the single tax. But the heart of the disagreement between Knight and George's supporters is that George's supporters see an important difference between the rent of land and other returns.

George's supporters use a system of categories in which an increase in return to a resource that is caused by the effort or abstinence of the owner of the resource is called a return to capital. The rent of a parcel of land is never the product of the effort or abstinence of the person with title to that land; it is produced by a combination of nature, public infrastructure, and private activities on surrounding land. If a person has exclusive access to land of greater value than others can have, he puts his fellow citizens at a disadvantage that deserves rectification, and a good society rectifies this disadvantage by public collection of rent.

Notes

1. Frank H. Knight. *Risk, Uncertainty and Profit* (London: Lund Humphries, 1948 [originally published in 1921]).

2. Entrepreneurs who agree to engage in an uncertain project can demand compensation ("economic profit") for the possibility that their project yields an unfavorable outcome whose costs they will have to bear.

3. Frank H. Knight. "Fallacies in the Interpretation of Social Cost," *The Quarterly Journal of Economics*, 38 (1924): 582–606.

4. Frank H. Knight. "The Ethics of Competition," *The Quarterly Journal of Economics*, 37 (1923): 579–624.

5. This was in contrast to Jonn Bates Clark's assertion that market outcomes are proper because the owner of each factor receives that factor's marginal product.

6. Knight, "Ethics of Competition," p. 623.

7. Frank H. Knight. "The Planful Act: The Possibilities and Limitations of Collective Rationality," in Frank H. Knight, *Freedom and Reform* (New York and London: Harper and Brothers, 1947), p. 369.

8. Frank H. Knight, "The Fallacies in the 'Single Tax",' *The Freeman*, August 10, 1953, p. 810.

9. Knight, *Risk, Uncertainty and Profit*, p. 149.

10. Frank Knight was not the first major economist to argue that the return to all factors of production ought to be classified as interest. Irving Fisher had already done so in 1907. Irving Fisher, *The Rate of Interest* (New York: Macmillan, 1907).

11. Knight, *Risk, Uncertainty and Profit*, pp. 169–70.

12. Frank H Knight, "The Ricardian Theory of Taxation and Distribution," *Canadian Journal of Economics and Political Science*, 1 (1935): 18.

13. Ibid., pp. 4–5.

14. Knight, "Interpretation of Social Cost," p. 591.

15. Assume that the value of having exclusive access to the resource is worth $\$x$, that there are y risk-neutral developers, and that each developer thinks that he has a probability of l/y to be the one who develops the resource. In the attempt to gain exclusive access to the resource, each developer would be willing to spend his expected gain, $\$x/y$, and the developers as a group would spend $\$x$. (See Dennis C. Mueller, *Public Choice II* [Cambridge: Cambridge University Press, 1989], pp. 231–35).

16. In his discussion of David Ricardo's economic theory, Knight wrote (Knight, "The Ricardian Theory," p. 18):

> [T]he notion that what are called "natural agents" are not produced (in the sense in which any material agents are produced) is false and reflects a false conception of production. In so far as . . . there was effective competition, the use of labor and property in pioneering and all exploration and development activities could not yield a return smaller or greater than that obtainable in any other use. That is, the result must be equal in value to its cost. This is true even if possession be obtained by a mere contest of fight, and not less so because such activity would not be socially necessary or useful.

17. Frank H. Knight, Review of George R. Geiger, "The Philosophy of Henry George," *Journal of Political Economy*, 41 (1933): 688.

18. Knight, *Risk, Uncertainty and Profit*, p. 160.

19. "Might be" because Knight's critique does not address the ethical motivation that is behind the proposal to impose a *single* tax on land.

20. Knight, "The Ricardian Theory," p. 17.

21. Frank Knight disagreed with this conclusion. He wrote (*Encyclopedia Britannica*, vol. IV (1946), pp. 779–801. Reprinted under the title "Capital and Interest" in *Readings in the Theory of Income Distribution*, American Economic Association (ed.), Philadelphia: The Blakiston Company, 1947, pp. 384–409):

> The distinction between human beings and property and that between personal and real property are important in law and human relations, but no fundamental economic differences correspond to them. . . . Realistic economic analysis must avoid any general classifications of productive agents and make distinctions on the basis of facts that are significant for the problem at hand. For general analysis, it would be desirable to drop also the traditional classification of income forms, and to speak of the yield and "hire" of productive agents, irrespective of kind. (ibid., p. 395).

However, if economic theory is to be used to draw any inferences about an existing economy, it is difficult to understand how distinctions that are "important in law" are not "facts that are significant for the problem at hand."

22. See, for example, the literature on the economic effects of the taxation of capital and investment.

23. This definition of land is slightly broader than the classical definition. According to this definition, produced things will be classified as land if it is impossible to find either the person who created them or his heirs, or anyone who has legitimately acquired them. For example, the wealth of victims of the Holocaust that is stored in Swiss bank vaults and whose legitimate owners or their legitimate heirs cannot be found would be classified as land.

24. Classifying factors of production according to social conventions might make it necessary to adopt a new classification system when social conventions change. For example, if a society adopts the convention that produced things do not belong to their producers, it might become appropriate to combine land and capital into a single factor. In a society that does not acknowledge any private property and considers it a citizen's duty to contribute his labor to society according to his ability, it might be appropriate to classify all factors of production as a single group. There is a certain irony in the fact that Frank Knight's suggestion to subsume all factors under the label "capital" seems to be most applicable to a purely communist society.

25. If natural resources are privately owned and the community levies a tax that is equal to the maximum amount that developers are willing to pay to obtain exclusive access to the resource for a fixed amount of time, then the market value of natural resources will be zero and the question of ownership is irrelevant from an economic point of view.

26. Knight, "Interpretation of Social Cost."

27. Ibid., footnote 8 on p. 591.

28. In a reply to Knight's review of George Geiger's book *The Philosophy of Henry George* (Knight, "Review"), Harry Gunnison Brown made the point that investment in land does not in general yield an extraordinary return. See Harry G. Brown, "Anticipation of an Increment and the 'Unearned Decrement' in Land Values," *The American Journal of Economics and Sociology* (1943): 343–57, reprinted in *Selected Articles by Harry Gunnison Brown: The Case for Land Value Taxation* (New York: Robert Schalkenbach Foundation, 1980).

29. In a 1922 essay (Frank Knight, "Ethics and The Economic Interpretation," *The Quarterly Journal of Economics* 36 (1922): 454–81), Knight argued for a separation of the science of economics, culture history (the explanation of motives), and ethical inquiry.

30. Frank Knight. "Socialism: The Nature of the Problem," *Ethics* 50 (1940): 253–89. See also Knight, "Capital and Interest," pp. 407–9.

31. Knight. "Socialism," pp. 277–78.

32. Knight, "Review," pp. 687–90.

33. Knight, "The Fallacies in the 'Single Tax'," pp. 809–11.

34. For example, Knight wrote (Knight, "Review," p. 688):

> All this reasoning is on a mental level not above that involved in the simpler operations of arithmetic. The economic and social ideas of Henry George are as a whole at the same per-arithmetical level, the level of those held before and since his time by all who have held any at all, apart from an insignificant handful of competent economists and other negligible exceptions. Henry George's claim to be an economist (or social philosopher either) rests on the possession of linguistic powers not uncommon among frontier preachers, politicians, and journalists, and on the fact that his particular nostrum for the salvation of society appeals to a number of people, no doubt for much the same reasons that made it appeal to him, and which give many other nostrums their appeal.

35. Knight, "The Fallacies in the 'Single Tax'," p. 809

36. Ibid., pp. 810–11.

37. This idea is developed in Nicolaus Tideman, "Global Economic Justice," *Geophilos*, Autumn, 2002, 134–46, and "Creating Global Economic Justice," *Geophilos*, Spring, 2001, 88–94.

38. Knight, "The Fallacies in the Single Tax'," p. 809.

39. Ibid., pp. 809–10.

40. Ibid., p. 810.

41. Ibid., p. 811.

42. Ibid., p. 810.

43. Ibid., p. 811.

44. For an account of land speculation in the United States, see Aaron M. Sakolski, *The Great American Land Bubble; The Amazing Story of Land-Grabbing, Speculations, and Booms From Colonial Days to the Present Time* (New York and London: Harper & Brothers, 1932).

45. The name "winner's curse" has been given to the phenomenon that the highest bidder for an object will be the person who has made the most extreme upward error in estimating its value. See Paul Milgrom and Robert J. Weber, "A Theory of Auctions and Competitive Bidding," 50 *Econometrica* (1982): 1089–1122.

46. Knight, "The Fallacies in the 'Single Tax'," p. 810.

47. For a discussion of the theory of assigning accident costs, see Guido Calabresi, *The Costs of Accidents* (New Haven: Yale University Press, 1970). For a more detailed discussion of the accident-cost argument for not compensating landowners, see Nicolaus Tideman, "Property Rights and the Social Contract: The Constitutional Challenge in the U.S.A.," in Richard Noyes, ed., *Now the Synthesis: Capitalism, Socialism and the New Social Contract* (New York: Holmes and Meier 1991) pp. 47–59.

48. Knight, "The Fallacies in the 'Single Tax'," p. 810.

49. For a discussion of the relationship between entitlements protected by liability rules and entitlements protected by property rules, see Guido Calabresi and Douglas Melamed, "Property, Liability and Inalienability: One view of the Cathedral," 85 *Harvard Law Review* (1972): 1089–1128.

50. See Richard J. Arnott and Joseph E. Stiglitz, "Aggregate Land Rents, Expenditure on Public Goods, and Optimal City Size," 93 *The Quarterly Journal of Economics* (1979): 471–500. For a discussion of the consequences of relaxing the assumptions, see Nicolaus Tideman, "Integrating Rent and Demand Revelation in the Evaluation and Financing of Services," in Hiroshi Ohta and Jacques-François Thisse, eds., *Does Economic Space Matter?* (London: Macmillan, 1993), pp. 133–50.

51. Knight, "The Fallacies in the 'Single Tax'," p. 810.

52. *Oxford English Dictionary* (Oxford: Clarendon Press, 1989), Vol. IX, pp. 1026–27.

53. Ibid., p. 1027.

54. Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (Indianapolis: Liberty Fund, 1981 [originally published 1776]), p. 161 [chap. XI, par. 5].

55. *Oxford English Dictionary*, p. 1026.

56. Loc. cit.

57. Knight, "The Fallacies in the 'Single Tax'," p. 810.