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Clark: Apostle of Two-Factor Economics

By Kris Feder

Henry George came to believe that economists, motivated by professional and pecuniary interests, had rejected the classical ("scholastic") political economy of Smith, Ricardo, Senior, and Mill expressly to neutralize his arguments for the single tax, which were based on classical principles. Despite its intellectual and popular success, his magnum opus, *Progress and Poverty*, had been maligned or ignored by most professional economists. A few had "resorted to misrepresentation," but "the majority preferred to rely upon their official positions in which they were secure by the interest of the dominant class, and to treat as beneath contempt a book circulating by thousands in three great English-speaking countries and translated into all the important modern languages."[1] In 1894 George wrote:

> "Progress and Poverty" has been, in short, the most successful economic work ever published. Its reasoning has never been successfully assailed, and on three continents it has given birth to movements whose practical success is only a question of time. Yet though the scholastic political economy has been broken, it has not been, as I at the time anticipated, by some one of its professors taking up what I had pointed out; but a new and utterly incoherent political economy has taken its place in the schools.[2]

George noticed "the first evidence of a change" in a widely distributed 1886 article announcing that the old political economy, based on Smith's "system of natural liberty," was dead, having been displaced by the German Historical School.[3]

Economics as a discipline was rapidly professionalized during the last two decades of the nineteenth century. The American Economics Association was formed, professional journals were founded, and colleges hired professors with advanced degrees to teach economics. American universities did not yet have graduate programs in economics, however, so many Americans earned their Ph.D.s in Germany. Here they were exposed to the Historical School, which

American Journal of Economics and Sociology, Vol. 62, No. 5 (November, 2003).
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held that generalizations in economics could not be developed until all the facts are assembled, and that in any case theory is inherently conditional and historical; there are no universal truths. Here, too, graduate students were exposed to an "entirely different philosophical and political heritage from that of England," one which "was more oriented toward group behavior and the social uses of property than toward political and economic individualism."[4]

George rejected both the nationalistic philosophy and the antitheoretical, inductive methodology of the German tradition. His vision of good government—"the administration of a great co-operative society . . . merely the agency by which the common property was administered for the common benefit"—was wholly at odds with the German state-centered ideal. George refers to the "protectionism" espoused by American economists, first at the University of Pennsylvania and "rapidly and generally followed," which he attributes to "an acquiescence in the views or whims of the wealthy class, dominant in all the colleges."[5]

The Historical School was indeed the most visible new development in economics during the 1870s and 1880s. It never, though, conquered mainstream economic thought. Economists soon came round to the view that both deduction and induction are useful in economic science. As it turned out, it was the "Marginal Revolution" that routed the old paradigm—and it was a leading American marginalist, John Bates Clark, who became George's most prominent, determined, and influential opponent. Clark (1847–1938) has been called "the first major American economist."[6] A co-founder and president of the American Economics Association, he received his graduate training in Heidelberg and Zürich. After teaching at Carleton College, Smith, and Amherst, he was recruited in 1895 by Columbia University, where he remained to the end of his career.

In his first book, *The Philosophy of Wealth* (1886), Clark intended to refute "strange teaching concerning the rights of property."[7] He criticized the fundamental methodology of economics, questioning on moral grounds the classical arguments for the social benefits of competition. He rejected the assumption that economic behavior is motivated by self-interest and "introduced into economics the Spencerian conception that society is an organic whole."[8] He never

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directly confronted the "strange teachings" to which he alluded, but he eventually revealed them to be the teachings of Henry George, who, according to Clark, failed to understand "the productive action of capital."[9]

Soon afterward, Clark experienced a "methodological conversion" and changed his mind about the social value of competition.[10] He came to believe that free markets tend to yield an efficient allocation of resources and a just distribution of wealth. He now exalted the virtues of private property and argued that absolute, perpetual private property in land was essential to the functioning of the market system. Armed with this conviction, Clark took a determined stand against the single tax. From the late 1880s to 1914, Clark devoted his professional career to discrediting the single-tax proposal on grounds of both ethics and economics.[11] He debated Henry George at Saratoga in 1890 and debated single taxer Louis F. Post at Cooper Union in 1903.[12] Directly or indirectly, he attacked George's analysis of land and rent in four books and dozens of articles. His articles include, to name a few, "The Ethics of Land Tenure," "The Moral Basis of Property in Land," "The Law of Wages and Interest," "Concerning Wealth That Resides in Land," and "Shall We Tax the Unearned Increment?" No economist ever worked more diligently to refute Henry George than did John Bates Clark.

His most highly regarded book, which compiles and systematizes earlier writings, was *The Distribution of Wealth*, published in 1899, two years after George's death. In the preface, Clark wrote that "it was the claim advanced by Mr. Henry George, that wages are fixed by the product which a man can create by tilling rentless land, that first led me to seek a method by which the product of labor everywhere may be disentangled from the product of cooperating agents and separately identified."[13] Clark set out to correct and build upon a kernel of truth in George's theoretical analysis. George's claim that wages are determined at the margin of production had anticipated the marginal productivity theory of distribution, but Clark used George's theory against him. Marginal analysis, said Clark, reveals fatal flaws in George's system of economics, starting with the conception of rent as a differential surplus. Just as wages equal the marginal product of labor, he argued, land rent equals the marginal product of

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land—and just as rent can be analyzed as a surplus when labor is varied relative to land in production, so can wages be analyzed as a surplus when land is varied relative to labor.

Marginal analysis showed that, if available technologies allow for substitution among inputs in production, an employer will hire labor or any other input at the quantity for which its (diminishing) marginal product equals its real wage or price. If the relative price of one input rises, a firm will employ marginally less of that input and marginally more of others. In competitive equilibrium, the real price of an input equals its marginal product in every firm and every industry. Thus, in a Ricardian model with homogeneous agricultural land, the rent "surplus" equals the quantity of land multiplied by its marginal product. The law of diminishing returns to land becomes the perfectly general "law of variable proportions."

Clark provided an ethical interpretation of marginal productivity theory. The marginal worker is the least productive worker employed, not because he is lazy or inept, but because he is, by definition, employed at the least essential task. Let any particular worker (or unit of labor) be removed from a factory, and the remaining workers (units) will be reallocated so that, in effect, it is the marginal worker who has been withdrawn. Because each worker is perfectly substitutable for any other, the withdrawal of any one forces total product to decline only by the product of the marginal worker. Therefore, any worker is the marginal worker, and the marginal product of labor measures each worker's true contribution to production. According to the marginal productivity principle, competition sets the real wage of labor equal to the marginal product of labor, so workers earn the full value of what they produced. Symmetrically, other incomes are compensation for what other factors produce and not, therefore, deductions from the product of labor. If markets are competitive, said Clark, labor has no legitimate complaint about the size of its distributive share.

Taken alone, this line of argument presents a weak case against the single tax. George had emphasized that land is productive. He held, not that rent is a deduction from wages, but that rent and wages are both determined at the margin of production, one necessarily

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rising as a share when the other falls. The marginal productivity principle shows that, if homogeneous land is exchanged in competitive markets, rent is the marginal product of land, just as the wage is the marginal product of labor. The symmetry, however, does not extend to the realm of justice. As George observed, wages are paid in return for the exertion of the laborer, but rent compensated no exertion on the part of the landlord. Clark did not argue otherwise. He avoided the point, preferring to attack from other angles.

He offered a second ethical argument against the single tax. He asserted that the state is the original, absolute owner of land, a perspective decidedly more German than American. According to Clark, individuals have no natural property rights in land or its rent. The state may give or sell land to individuals, whereupon that land becomes their absolute, exchangeable, and perpetual property. However, the state may neither tax land that it has once alienated, nor lease land that it owns to individuals on periodic terms—for this would be to permit the state to implement a Georgist program. Property in land, insisted Clark, is absolute, whether the owner is an individual or the state, and absolute ownership is, by definition, perpetual ownership.[14] Though an individual may wish to use a piece of land for only five years, or thirty, or seventy, to acquire an exclusive claim he must be willing and able to purchase, up front, the present value of all future rents in perpetuity.

Clark's positive arguments against George were more intricate. They combined the theory of marginal productivity with a microeconomic model of competitive static equilibrium to yield a new framework for the analysis of production and distribution.

Paradigm Shift: Two-Factor Economics

The most remarkable feature of Clark's system, and the one most obviously designed to close the book on Henry George, was the two-factor theory of production and distribution. Whereas the principle of marginal productivity suggests, at most, that rent can be viewed as the marginal product of land as well as a differential surplus, Clark's definition of capital eliminates land rent as a category of income.

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According to Clark, labor and capital are the primary factors of production. "Land" is not an original or distinct factor but merely a type of capital good; it has no special significance in economic analysis.

> Land and artificial goods are blended in an intimate mixture. . . . There are only two generic members in the combination by which the rate of wages is determined. . . . [T]he variations in the comparative amounts of these two agents, labor and capital, determine both wages and interest.[15]

Clark's capital theory was his singular and most enduring contribution to economic thought. He believed that his interpretation of marginal productivity disposed of George's single-tax remedy. Land is capital and rent is interest, so if the interest of capital is earned income, as George insisted, then so is the rent of land. To tax land is to confiscate capital; Georgism is socialism.

Two-factor economics was more than a challenge to Henry George, however. In denying the analytic importance of land, Clark rejected central themes and theorems of the classical school of political economy. In *The Science of Political Economy*, George included marginalism as well as the Historical School with the new "economics" that made the "teachings of 'the classical school' of political economy . . . obsolete."[16] He did not mention John Bates Clark, but he disparaged Marshall's "incomprehensible works" and dismissed the entire Austrian branch of marginalist thought—Menger, Wieser, and Böhm-Bawerk. It was not marginalism, however, but Clark's new theory of capital that challenged George's fundamental propositions.

Clark's intentions were evident to his peers. Frank Fetter observed that the "single-tax agitation" motivated Clark's reformulation of the capital concept.[17] Simon Nelson Patten, another determined opponent of the single tax, lamented, "the worst of the matter is," the single-tax advocates "have . . . the mass of the older economists on their side." Patten continued:

> Nothing pleases a socialist or a single taxer better than to quote authorities and to use the well-known economic theories to prove his case. The economists rubbed their eyes in surprise when this assault first began; but they soon realized that their favorite authors were not so perfect as they supposed and that economic doctrine must be recast so that it would rest wholly on present data. This, I take it, is the real meaning of the present movement in economic thought.[18]

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George saw his own work as "completely recasting political economy."[19] Yet he developed his theoretical system using the language and the analytical framework of the classical school. He adopted their methodological starting point, the assumption that rational actors "seek to gratify their desires with the least exertion."[20] He utilized classical principles, including the law of diminishing returns to land and Ricardo's celebrated law of rent. George also shared with classical writers the ideology of classical liberalism. Following Smith, he praised the moral and practical virtues of economic freedom. He took to heart Smith's words on the role of specialization and exchange in multiplying the productive power of labor, making it a central feature in his theory of urban rent.

Most significantly, classical writers had identified the basic categories of distribution as rent, wages, and interest (or sometimes "profit"), corresponding to the three great social classes—landlords, workers, and capitalists. George had used this framework to develop a functional theory of distribution, defining rent, wages, and interest as functional returns to land, labor, and capital, the three factors of production. Pure profit is a residual that goes to zero in competitive equilibrium.

Classical economists had elaborated the "all-devouring rent theory," which was the thesis that, land being fixed in amount, as population grows rent must eventually rise as a distributive share. In the very long run, the economy reaches a "stationary state" in which population can grow no further because wages equal bare subsistence, profit or interest is driven down to a level that supports replacement of capital but no new investment, and the lion's share of output is distributed as rent.[21]

Moreover, from the Physiocrats to Mill, political economists had entertained the notion that the rent of land is a taxable surplus.[22] John Stuart Mill had advocated a tax on the future increases in land values, arguing that this would capture for the public the benefits of future growth while imposing no injury on current landowners. He believed that a basic responsibility of government was to ensure that nature's gifts are enjoyed by all. In 1848 Mill had written:

> It may be imagined, perhaps, that the law has only to declare and protect the right of every one to what he has himself produced, or acquired by

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> the voluntary consent, fairly obtained, of those who produced it. But is there nothing recognized as property except what has been produced? Is there not the earth itself, its forests and waters, and all other natural riches, above and below the surface? These are the inheritances of the human race, and there must be regulations for the common enjoyment of it. What rights, and under what conditions, a person shall be allowed to exercise over any portion of this common inheritance cannot be left undecided. No function of government is less optional than the regulation of these things, or more completely involved in the idea of civilized society.[23]

This was the intellectual tradition that George inherited. If Clark's analysis was correct, it proved that classical concerns about the distribution of wealth were unfounded; that rent plays no special role in the functioning of economic systems; and that property rights in land are just like property rights in what labor produces. Later chapters will show how Frank Knight and others adopted and applied Clark's two-factor taxonomy, putting land and its rent out of sight. If historians of economic thought today neglect to remark upon the ideological purpose of Clark's capital theory, it is because of his very success in recasting economic theory to make Georgism appear obsolete and inconsequential.

Yet Clark's two-factor macroeconomic interpretation of the marginal productivity theory of distribution was spurious. George had argued that capital must be distinguished from land because capital is itself produced with labor applied to land. Land itself is not produced, but it is necessary to all production. Clark's model, however, starts with fixed quantities of both "labor" and "capital." Capital is never produced and it does not depreciate; it is simply given. Land cannot be distinguished from capital simply because Clark has defined "capital" to possess the essential feature of land.[24]

The marginal productivity principle is a microeconomic concept. It describes how an individual producer's demands for productive "inputs" depend on their technical contribution to production and on the market prices of inputs and outputs. Inputs are distinguished solely on the basis of their role in production; supply conditions or other characteristics are irrelevant. Each input or factor is homogeneous in the sense that all units have exactly the same technological relationships to other cooperating inputs and to output. A production

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function, which describes the technical relationship between inputs and outputs, can have any finite number of inputs. Marginal analysis has little to say about whether there are two, three, or more generic factors of production—or whether "factors of production" is even a useful concept at all.

For George, the three productive factors are fundamentally different in kind. "The term land necessarily includes, not merely the surface of the earth as distinguished from the water and the air, but the whole material universe outside of man himself, . . . all natural materials, forces, and opportunities. . . ."[25] Labor includes all human exertion in the production of wealth. Capital is a secondary, composite factor; it includes all productive inputs that are themselves produced by applying labor to land. Nothing in Clark's marginal theory of distribution helps to evaluate George's three-factor taxonomy.

The Ghost in the Machine: Clark's "Transmigration" of Capital

By characterizing capital and, therefore, land as homogeneous, Clark's model is unable to capture the theory of urban rent that is central to George's analysis. In George's adaptation of Ricardo's law of rent, land is not perfectly homogeneous but perfectly heterogeneous. Each parcel is unique by virtue of its location with respect to other parcels, if in nothing else. With heterogeneous inputs, the analysis must proceed by comparing not marginal values but total values. In the field of urban economics, where the economic theory of urban location and site value quietly survives today, land rent is a differential surplus.

The marginal productivity model of distribution requires that each of n inputs be homogeneous so that individual units can be summed. An input is homogeneous when each unit of the input has the same technical effect as every other, and all units exchange for the same market price. It was not Clark's intention, however, to model a simple world with only one type of capital good and one class of labor. To interpret the marginal productivity principle in terms of his two-factor theory of distribution, Clark had to show that all individual units of capital are perfectly substitutable in production for all other units.

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This he achieved by defining "capital" to mean, not an assortment of productive implements, but, roughly, the aggregate real financial value of the exchangeable material assets owned by investors.[26] "Capital goods," including land, are material, durable objects that are exchangeable and yield an income. They are the concrete instruments of production. "Capital" is a fund of wealth "invested in" capital goods and land.[27]

Businessmen "speak of capital in terms of money." A merchant might say, for example, that his capital "is the hundred thousand dollars that I have invested in my shop."[28] Money itself is not capital, however, but only a measure of capital. "A value, an abstract quantum of productive wealth, a permanent fund—that is what the hundred thousand dollars really signify."

> Guarding ourselves as carefully as we have done against the idea that capital ever lives in a disembodied state, we may safely use, for scientific purposes, the business man's formula. We may think of capital as a sum of productive wealth, invested in material things which are perpetually shifting—which come and go continually—although the fund abides. Capital thus lives, as it were, by transmigration, taking itself out of one set of bodies and putting itself into another, again and again.[29]

Thus, permanent capital "transmigrates" from one material embodiment to another as financial resources are withdrawn from one use and invested in another. Capital flows freely not only among produced capital goods but also between capital goods and land.

Capital goods (except for land) are produced, wear out, and are replaced—but capital, said Clark, never has to be produced and never wears out. "The most distinctive single fact about what we have termed capital is the fact of permanence. It lasts; and it must last, if industry is to be successful. Trench upon it—destroy any of it, and you have suffered a disaster."[30] Capital "is contrasted with free income, which may be used up on one's living or on one's pleasure." Capital, moreover, is perfectly mobile, in contrast to capital goods.[31]

According to Clark, interest is the income of permanent capital. In competitive equilibrium, the flow of net income from any material asset represents a normal rate of interest on the current market value of the asset. Capital goods are heterogeneous, but the equilibrium

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allocation of capital goods is such that every asset earns the same proportionate rate of return on its value.

Land, said Clark, is a capital good because, like capital goods, it yields a flow of income that can be sold in its entirety as an asset. A landowner can exchange his land for capital goods just as one capital good can be exchanged for another. The principle of competition, expressed by George as "equal returns to equal exertions,"[32] ensures that all exchangeable assets yielding a certain income would sell for the same price in the equilibrium of a competitive market, regardless of their original cost of production—or whether they were ever produced at all.

This argument misrepresents the principle of marginal productivity. Marginal productivity theory requires that each unit of a factor be substitutable for any other unit in a firm's production function—but *Clark's fluid "capital" is not an input in production.* Units of "capital" are substitutable, not in production, but purely in exchange. Their equilibrium values result, not from the allocation of resources among productive uses according to the equimarginal principle, but from the mathematical logic of asset capitalization. Existing assets, such as land, yield the same rate of return on current value simply because their current prices are derived by capitalizing their expected future returns at the market rate of interest, which is the marginal rate of return on investment.[33] That land can be exchanged for capital goods in investors' portfolios is not a reason to include land with capital in an account of the factors of production.

Clark's theory requires that income streams through time be bundled and sold as property. Clark insisted that the time-dependent productive powers of land must not be sold separately, ensuring that the perpetual income flows from land are exchangeable assets. Some income streams, however, are seldom exchanged in market transactions. Technical education and other investments today called "human capital" are not capital goods, said Clark, because they are not material and therefore not transferable among persons.[34] Nevertheless, if markets for human beings as productive assets were to exist, then the equilibrium price of a worker would equal the present value of his net product, discounted at the market rate of interest. Thus even

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wages of labor are really "rents," and in equilibrium, are equivalent to interest on the imputed asset value of the worker himself.[35]

The problem with this argument is that if labor is just another interest-earning asset, then labor and capital are not two distinct factors, but one. Clark conceals the implied identity between his two "factors" by defining a unit of labor in terms of a flow of productive service rather than the capitalized value of the worker. The only meaningful distinction between capital and labor in Clark's model appears to be that, at least where slavery is outlawed, the income stream from labor cannot be "capitalized," packaged, and sold in competitive markets.

A prominent feature of Clark's static equilibrium model is that particular capital goods may be continually changing form, yet the aggregate quantity of capital must remain strictly fixed. Apparently, whenever a new hammer or steam engine is produced, other capital goods of equal value must simultaneously be consumed or destroyed. Clark justifies the assumption two ways. First, he claims, businessmen insist on maintaining their total capital at a constant level, even as they alter their investment patterns. This suggestion will be examined below. Second, methodologically, the static model of distribution requires fixed inputs. If so, however, that would be a reason to choose a different model, not to conclude that produced capital is actually fixed in aggregate supply.* Whatever its intended purpose, the effect of Clark's fixed-capital assumption is further to obscure the distinction between land and capital.

Though Clark held that the interest of capital has to do with the role of time in production, the simple structure of his marginal productivity model makes no provision for examining intertemporal decisions. It is possible to explore the marginal productivity of capital using a simple intertemporal model in which a firm chooses among projects with different streams of net income, but no purely static model can be expected to reveal much about the nature of capital. Clark's marginal productivity theory treats production as instanta-

*In a Leontief input-output production model, for example, the quantities of capital goods are not exogenously given but endogenously determined on the basis of given original resources, the technical coefficients of production, and a specified set of final demands.

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neous; there is no time variable in the production function. The variables designated "Labor" and "Capital" take symmetrical positions. They represent any two homogeneous inputs that cooperate to produce output in timeless equilibrium.

Statics and Dynamics

George's economic theory was presented with reference to a sequence of models of increasing complexity. According to George, "principles obvious in the simpler relations of men are merely disguised and not abrogated or reversed by the more intricate relations that result from the division of labor and the use of complex tools and methods."[36] He attributed to Adam Smith a simple model of "the original state of things," faulting him for not taking "this as the initial point of his reasoning."[37] In his own reasoning George referred frequently to the case of a primitive society characterized by limited division of labor, simple technology, and barter transactions.

In his analysis of modern industrial economies, George proceeds in two stages, "statics" and "dynamics." Static analysis yields the laws of rent, wages, and interest, which must "correlate and coordinate."[38] Competitive static equilibrium is characterized by the rule of equal returns to equal exertions. Dynamic analysis pertains to the long-run changes in production and distribution that result from the forces of progress (population growth, capital accumulation, and improvements in technology). A central feature of his dynamic model was an endogenous process: The "expectation raised by material progress itself"[39]—the expectation of continuing increase in rent—engenders land speculation, which causes further appreciation at the expense of labor and capital. Fueled by credit transactions in a modern financial system, speculation further impedes production and causes industrial "paroxysms" of boom and bust.[40]

John Bates Clark evidently shared with George an appreciation for the usefulness of models in tracing the operation of basic principles. Clark identified three natural divisions of economics. The first division, "universal" or "primitive" economics, deals with laws not dependent on organization. This is the economics of Robinson Crusoe, an isolated individual for whom there is production but no

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exchange. The second division, "social economic statics," is the realm of static laws that are dependent on exchanges. The final division is "social economic dynamics."* Dynamics is the study of the economy's responses to exogenous shocks, and of the nature of progress.

However, Clark focused his attention almost exclusively on the second division, social economic statics. He emphasized that "static laws dominate the activity of a real and dynamic society."[41] "Social production may be thought of as static," said Clark. "Only in a static society can values, wages, and interest be 'natural,' in the traditional sense."[42]

In Clark's model the two factors that cooperate to produce the economy's output are formally indistinguishable from land. They are made available in fixed quantities by assumption, and their supplies cannot be increased or decreased. To merge land with capital, however, was by no means the only achievement of the static model. Clark used it to argue that land speculation does not reward landowners with unearned income.

In the static model, all markets for goods and assets are perfectly competitive and exchanges occur without "friction" at uniform prices. The factors of production are fixed in supply. Buyers and sellers have perfect foresight; all future incomes are fully known and are reflected in current asset prices. All resources are allocated to their most valuable uses according to the principle of marginal productivity, just as goods are allocated according to the twin principle of diminishing marginal utility. Pure profits are everywhere zero.

Competition, said Clark, ensures that in static equilibrium, land prices adjust so that the income of land is just sufficient to compensate the landowner for the normal interest cost of holding land. Land is freely exchangeable for produced wealth, so the equilibrium price of a parcel of land must equal the price of any produced asset that yields an equivalent income. Thus, landowners can earn no more

*Division I, pure production, has both statics and dynamics. Clark says in footnote 1, pp. 34–45, that there are four fields—(1) primitive economic statics, (2) primitive economic dynamics, (3) social economic statics, and (4) social economic dynamics. However, "As our entire purpose is to understand the laws of a dynamic social industry, we attain our end by covering only fields 1, 3 and 4."

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from their property than they could have earned by investing their savings in capital goods. There is no problem of distribution to be solved. In attempting to correct an injustice that does not exist, the single tax would create an injustice by depriving innocent landowners of their savings.

This astonishing result follows directly from the restrictive assumptions of his model, particularly the assumption that all individuals have complete and perfect foresight. With no uncertainty there is, of course, no risk and no "luck." In such a model, prices are in equilibrium at every moment, even when equilibrium prices are changing over time. It is the assumption of perfect foresight that converts what is ostensibly a dynamic analysis into a purely static one.

To be successful, a speculator must have better foresight or better luck than other market participants. If everyone has perfect foresight, there can be no speculative gains. The "expectation raised by material progress" is fully capitalized in land prices from the beginning of time.

"Rent," according to Clark, is the income of any capital good, and "interest" is rent measured as a proportion of asset value. In competitive static equilibrium, all rents are equivalent to the interest of capital. What George characterized as the "unearned increment" of land values is really interest earned by savers and investors. Even if land values are increasing, the present value of future increments is capitalized in present land prices so that buyers earn just the normal market rate of interest on the value of their investments. Thus, suppose the annual rate of interest is 7 percent. A certain acre of land yields a perpetual rent of $35 annually. The capitalized value of the acre is $500. Suppose that the rent of a second acre is $35 this year but is expected to rise at a compound rate of 2 percent per year. The capitalized value of this parcel today is not $500 but $700.* Land buyers thus pay in advance to acquire the higher expected future rents.

It was noted above that Clark dismissed George's ethical arguments for the single tax by asserting that the state is the original and absolute

*Given rent at time t of R_t, interest rate i, and appreciation rate a, the selling price at time t is $R_t/(i - a)$.

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owner of land and may dispose of land as it pleases. If some readers were repelled by Clark's political philosophy, he assured them that, for the most part, democratic governments had privatized land on behalf of the public interest, and with good results. According to Clark, an unrestricted market with absolute and perpetual land titles is sufficient to allocate land efficiently and distribute rent fairly. If titles asserting perpetual ownership of heretofore unclaimed land are freely awarded, first-come first-served until no more is left, and all subsequent land transfers arise from voluntary exchange, then there is no injustice among persons.[43]

Was Clark correct that a once-for-all distribution of land rights would engender no windfall gains or losses? Under a sympathetic interpretation of his static model, he was. Suppose that a state has possession of a large uninhabited territory. Land rent is zero at first, but the future growth of population is foreseen by prospective immigrants, so land has a value. The value of any parcel is the discounted present value of future rents, which, everyone knows, will perpetually rise.

Following Clark, suppose that as settlers begin to arrive, the state gives them land for the asking, first-come first-served. Immediately we encounter the difficulty that, if there are no transaction costs ("friction") and no restrictions on the size of the grant that a settler may receive, then the first settler will be pleased to claim the whole territory. Its value per acre is not large, because most of the anticipated rent is not due to arrive for some time; but as soon as a second settler arrives, the first claimant can begin to receive rent income not only as a producer, but also as an owner. A further problem arises as well: The first settler is a monopolist. He will have the power to demand more for the use of land than the competitive model predicts.

Clark, of course, had in mind the settlement of the American West under the terms of the Homestead Act. Land grants were restricted in size and settlers were normally required to improve their claims as a condition of ownership. The latter condition violates Clark's theoretical assumption of free, unregulated markets, and it creates an incentive for rent-seekers to waste resources by undertaking premature investment as the price of ownership. Clark ignored these difficulties; he praised U.S. land policy and even suggested that rising

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land values diffuse themselves in wages,[44] an argument that is inconsistent with his own marginal productivity theory of distribution.

Suppose, then, that the state gives an equal share of land to each settler in the first generation. Suppose, further, that in the first generation there are one hundred settlers and the total market value of the territory is $5000. Each settler acquires, for a price of zero, land that is immediately worth $50. In this case, each settler in the first generation enjoys a once-for-all windfall that is not available to any future buyer, contrary to Clark's claim. Moreover, the state has no revenue with which to finance government expenditures. Presumably, it will have to impose taxes on the future earnings of labor and capital, since there are no unearned incomes to tax.

So let us assume, instead, that one hundred settlers arrive simultaneously and that the state distributes land in a once-for-all competitive auction. Equilibrium auction prices ration the demand for land to meet the available supply. There is no problem of liquidity; with perfect foresight, no risk, and no friction, everyone can costlessly borrow or lend at the same rate of interest. Given the price he must pay, each settler is content with his share of the total, for the marginal value to him of an extra acre would be less than its price. Suppose each settler pays $50 for a parcel of land. The state receives an immediate payment of $5000, which it can invest at interest to finance future government expenditures. If the interest rate is 5 percent, for example, the government can have a perpetual interest income of $250 per year. Alternatively, it can reinvest all or part of the income so that its endowment grows over time at compound interest.

Meanwhile, let us suppose, each young settler plans to work for forty years, then to sell his land and retire. He earns wages for his labor. He enjoys a small imputed rent from the use of the land that he owns, and he looks forward to receiving a large capital gain from the sale of his land at retirement. However, he has interest cost to pay. He must have paid the initial $50 land price either by depleting his savings or by taking a mortgage. If he drew down his savings account to buy land, then (at 5 percent) he is losing $2.50 annually in interest that his savings would otherwise have earned. If he borrowed to buy land, he is paying $2.50 annually out of pocket to service the mortgage.

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The years pass. Each individual buys perpetual ownership of an extent of land, spends his working life using resource flows and consuming resource stocks, and finally sells perpetual ownership of what's left to a member of the next generation. As population grows, the average individual necessarily buys a smaller proportion of the earth's resources, and the relative price of land rises to ration demand. However, all this was perfectly foreseen by the first settlers. Each paid $50 not because he expected to receive $50 worth of land services during his tenure, but because he calculated that forty years of land services plus the capital gain he would eventually receive at sale would, together, sufficiently compensate him for the interest cost of land purchase. He cannot, though, hope to get more than enough to compensate him, by the law of competition.

There is no danger of wasteful land speculation. A land buyer can return normal interest on his investment only if he uses his property to its best advantage. No one can profit by buying land, holding it idle, and eventually selling at a higher price. To break even—to repay principal and mortgage interest on the value of the investment—the owner must employ the land at maximum efficiency during his tenure so as to extract the potential rent income. By withholding from use land that has a positive current rent, a speculator incurs a loss.

As population continues to grow, each generation pays more for land than its predecessors. Yet none is disadvantaged. Like the first settlers, new entrants have unlimited access to financial capital at 5 percent, and they know that forty years of imputed rent income plus the capital gains they will receive at retirement will just compensate them for the interest cost of their investment. Taking into account the lifetime flows of both imputed rent income and interest cost, each individual buys only the land-time that he uses and uses only the land-time that he buys. Land titles are perpetual, but on balance, each settler pays only for what he takes. Everyone buys low and sells high, yet no one enjoys a windfall gain.*

*It is worth noting that interest is not equal to rent, as Clark suggested, but greater. Rent plus the annual appreciation of land value equals annual interest cost. If population and rents were constant over time, appreciation would be zero and rent would equal interest just as Clark said, but the equality of rent and interest is only an equilibrium condition, not an identity.

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There is a further complication. The expenditure side of the government budget can also potentially bestow unearned gains on privileged individuals and impose losses on others. We therefore add a final assumption: Let the state exercise its absolute authority by using the interest income from the original land sale to provide public goods to which everyone in every generation has equal access. Its wise investments increase the value of land in the realm, but of course these gains, too, are already capitalized in land prices, so they bestow no special benefit on landowners. In this world, Clark was right—a system of absolute, perpetual private property in land can do no harm. Analytically and practically, it is equivalent to the single tax!

The problem, of course, is that to achieve this theoretical result, we abstracted from the very features of the real economy that account for the problems that the single tax was meant to solve. In a real dynamic economy, capitalized values reflect subjective estimates regarding an uncertain future. When expectations are revised in response to changing conditions, the "rent" of a particular capital good diverges from what would yield normal interest on sunk cost, that is, the actual amount initially invested by production or purchase of the asset. A capital gain or loss is required to reestablish asset equilibrium.

Ironically, Clark's methodology undercuts his own argument that the single tax would unfairly burden landowners. According to Clark's story, all future taxes on rent or land value would be fully capitalized in present prices. If the discounted present value of taxes attaching to a particular parcel is $100, then the purchase price of that parcel is exactly $100 less than it would be in the absence of the tax. No burden whatsoever is imposed on landowners.

Whatever its merits as an analytical device, Clark's static model does not carry far against Henry George, whose theory concentrated on the dynamics of a real economy. The passing of time is of little significance in a world where the future is fully known and accounted for in advance. Even Clark admitted that actual economies are normally moving between shifting equilibria at any moment, but he ignored most of George's arguments about speculation, strategic behavior, risk, error, transaction costs, capital market imperfections,

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collusion, hoarding, externalities, monopoly, location value, monetary disturbances, macroeconomic cycles, the political process, and the effects of public spending on land values. By focusing on competitive static equilibrium in a model with perfect foresight, Clark provides no framework with which to challenge George's theory of economic systems. Such a model can neither substantiate nor refute George's case for the single tax.

Clark's primary defense against George's dynamic analysis was to say that economics had not yet evolved to the point where it was prepared undertake a study of dynamics. "If present plans shall be realized," he wrote in 1899, "this work will in due time be followed by another, which will deal with the distinctly dynamic laws."[45] Clark was professionally active for another quarter century, but never produced the promised volume.

Value from Production and Value from Obligation

In a chapter in *Progress and Poverty* on "The Meaning of the Terms," George critically reviewed the definitions of "land," "labor," and "capital" given by political economists. He could find no writer who had provided a satisfactory taxonomy of factors and applied his definitions consistently in his reasoning. John Bates Clark was hardly the first to subsume land under capital:

> Henry C. Carey, the American apostle of protectionism, defines capital as "the instrument by which man obtains mastery over nature, including in it the physical and mental powers of man himself." . . . An English economic writer of high standing, Mr. Wm. Thornton, begins an elaborate examination of the relations of labor and capital by stating that he will include land with capital, which is very much as if one who proposed to teach algebra should begin with the declaration that he would consider the signs plus and minus as meaning the same thing and having the same value. An American writer, also of high standing, Professor Francis A. Walker, makes the same declaration. . . . Another English writer, N. A. Nicholson . . . seems to cap the climax of absurdity by declaring in one paragraph . . . that "capital must of course be accumulated by saving," and in the very next paragraph stating that "the land which produces a crop, the plow which turns the soil, the labor which secures the produce, and the produce itself, if a material profit is to be derived from its employment, are all alike capital." But how land and labor are to be accumulated by saving them he nowhere condescends to explain.[46]

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George attributed much of the inconsistency to confusion between wealth as reckoned by the businessman and wealth as studied in political economy. Wealth to the individual businessman includes all exchangeable assets, real or financial. Political economy, however, must adopt a social point of view. Real capital is increased by real net investment, that is, by producing new capital faster than old capital depreciates. Financial wealth is increased merely by exchanging rights to existing wealth, that is, by credit transactions; it "adds nothing to the common stock."[47] It is a fallacy of composition to suppose that aggregate wealth can be measured by summing business wealth, for every credit is balanced by a corresponding debit.[48] "Only such things can be wealth the production of which increases and the destruction of which decreases the aggregate of wealth."[49] As he sifted through various definitions of economic terms, George noted:

> As commonly used the word "wealth" is applied to anything having an exchange value. But when used as a term of political economy it must be limited to a much more definite meaning, because many things are commonly spoken of as wealth which in taking account of collective or general wealth cannot be considered as wealth at all. Such things have an exchange value, . . . but they are not truly wealth, inasmuch as their increase or decrease does not affect the sum of wealth. Such are bonds, mortgages, promissory notes, bank bills, or other stipulations for the transfer of wealth. Such are slaves . . . Such are land, or other natural opportunities, the value of which is but the result of the acknowledgment in favor of certain persons of an exclusive right to their use . . . Increase in land values does not represent increase in the common wealth, for what landowners gain by higher prices, the tenants or purchasers who must pay them will lose.[50]

In *The Science of Political Economy*, George referred to the two sources of value as "value from production" and "value from obligation." Value from obligation arises from exchange agreements and represents a transfer of rights to existing wealth, not production of new wealth. According to George, Adam Smith had failed to distinguish consistently between the two sources of value. "This therefore has been the point on which the political economy founded by Adam Smith has been constantly at sea."[51]

Clark's "capital goods" are roughly equivalent to George's "wealth,"

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and George's distinction affords an apt critique of Clark's theory of capital. By confusing exchange with production, Clark disguises the fundamental distinction between land and wealth. Wealth is produced and exchanged, but land can only be exchanged.

In Clark's static model, capital remains fixed in total amount as it moves fluidly among the material bodies of produced capital goods and land. The odd implication appears to be that when land values rise, the quantity of produced capital goods must necessarily fall to maintain a fixed total value of assets. Suppose, however, that the assumption of fixed "capital" is relaxed. According to Clark, capital is accumulated by saving, that is, by diverting labor from the production of consumer goods to the production of capital goods. It is obvious that nonproduced land cannot be accumulated in this way. Fortunately, the marginal productivity model also requires that land and other "capital goods" be perfect substitutes in production, so presumably no difficulty is presented by the fact that the land portion of "capital" remains fixed in amount while the produced portion grows. Moreover, according to Clark, capital is increased when land prices rise. When any parcel of land becomes more valuable, capital "transmigrates" into that parcel. A general increase in land values, other things equal, implies an increase in aggregate capital.

This argument commits precisely the error of which Henry George warned. Some individuals can use their savings to buy land from other individuals, but the quantity of land is not thereby increased. If an individual buys an acre of land for $1000, saved from his wages, the seller receives $1000 in cash in exchange for his property. Savings devoted to land purchase lead to no new investment; as the buyer saves, the seller dissaves.

Suppose that the land rises in value, and in a few years' time our investor can either sell the land for $1800, making a capital gain of $800, or lease it to tenants at a correspondingly higher annual rate. According to Clark, social wealth has increased by $800.

It is possible that the land's appreciation resulted from an increase in its productivity. Perhaps the municipal government has built a new park or subway station nearby, raising the value of urban residential land. In that case, however, it was the infrastructure produced by government, not the subsequent exchange of property rights, that caused

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the gain in land value. Whether the owner sells the parcel for the competitive price of $1800, or lets it go for an even $1000, or gives it to his daughter for the nominal price of $1, the productive power of land is the same, and accumulated wealth is the same. The negotiated price simply determines how the gain shall be divided.

Moreover, it is possible that the parcel rose in value not because it has become more productive, but because land of comparable quality has become scarcer due to resource depletion, population pressure, speculation, or regulation. In that case, to treat land appreciation as an increase in wealth is especially misleading. Wrote George:

> Whatever increases the obstacles, natural or artificial, to the gratification of desire on the part of the ultimate users or consumers of things, thus compelling them to expend more exertion or undergo more toil and trouble to obtain those things, increases their value; whatever lessens the exertion that must be expended or the toil and trouble that must be undergone, decreases value. Thus, wars, tariffs, pirates, public insecurity, monopolies, taxes and restrictions of all kinds, which render more difficult the satisfaction of the desire for certain things, increase their value, and discoveries, inventions and improvements which lessen the exertion required for bringing things to the satisfaction of desire, lessen their value. . . . Scarcity may be at times to the relative interest of a few; but abundance is always to the general interest.[52]

Land, Labor, and Capital in a Model of Pure Production

In short, Clark did not advance economic science by including land with capital. His formal models cannot withstand the economic interpretations he gave them. His two-factor interpretation of marginal productivity is arbitrary and misleading. The restrictive assumptions of the static model preempt inquiry into the economic phenomena with which George was concerned. Clark's businessman's concept of "transmigrating" capital turns on a fallacy of composition that Henry George had shrewdly analyzed; it confuses value from production with value from obligation.

We are left with more questions than answers. At stake are the foundational categories of economic theory. Is "land," as George defined it, a distinctive, original, and indispensable factor of production? Does the rent of land have analytic significance for economic

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behavior? Is there a methodological justification for classifying productive resources according to *any* simple taxonomy?

George and Clark were agreed that the laws of production belong to the first natural division of economics, which Clark called "universal" or "primitive" economics. As both writers observed, they operate even in a Robinson Crusoe world with no exchange.[53] In the Crusoe economy, said George, the elemental fact of production is evident: "Nature gives only to labor."[54] The Crusoe model is an ideal instrument for exploring George's distinctions among "land," "labor," and "capital," as well as Clark's alternative conceptions of "capital" and "capital goods." In a model of pure production, value from obligation cannot exist and there can be no fallacy of composition in the analysis of wealth and capital. There are no markets, because there is no one with whom Crusoe can exchange. He is neither debtor nor creditor; there is no one from whom he could borrow or lend. No one arrives either to offer or to demand payment in exchange for the use of the island. No one challenges his claim of exclusive possession, so long as he lives—yet he has no property rights, because there are no social arrangements defining the proper relations of exchange.

The methodological starting point for economic analysis is the universal "economic problem": Human desires are unlimited, but the resources with which to satisfy them are scarce. Economics is concerned with individual and social behavior involving purposeful choice among alternative uses for scarce resources.* An economic agent is a decision maker who chooses with purpose. If meaningful distinctions are to be drawn among labor, land, and capital as productive factors, they must be relevant to the decision problems facing economic agents. A chemist or physicist might identify no fundamental distinction between human decision makers, human artifacts, and the natural substances of the earth; all material things are composed from a finite number of chemical elements and presumably obey the same physical laws. A cellular biologist might identify no

*A resource is said to be scarce when less is available than individuals would choose to use if it were freely available in unlimited amount. Scarce resources are economic resources.

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essential difference between a farmer and his cows. Does Robinson Crusoe, in his struggle to survive, distinguish labor from land and land from capital?

George's functional economic distinction between land and labor is based on the perspective of the human decision maker seeking to assure his own survival and well-being. Crusoe learns which things he can control and which things he cannot; that is, he learns the difference between himself as an agent and the environment in which he finds himself. Labor, according to George, is the "active" factor of production; land is the "passive" factor.[55] It is not, however, the physical action of the muscles that makes labor "active." A dairy cow is active in the same sense. The relevant *actions* are the decisions of the *agents* who employ cows and other resources for the purpose of gratifying their desires. To the economist, cows are different from humans because humans do not recognize cows as free agents who choose to engage in voluntary transactions with humans according to a mutually agreed system of property rules. Cows are outside the circle of exchange.

> All human actions, or at least all conscious human actions, have their source in desire and their end and aim in the satisfaction of desire. The intermediary action by which desire secures its aim in satisfaction, is exertion. The economic term for exertion is labor. It is the active, and *from the human standpoint, the primary or initiative, factor* in all production—that which being applied to land brings about all the changes conducive to the satisfaction of desire that it is possible for man to make in the material world. In political economy there is no other term for this exertion than labor. That is to say, the term labor includes all human exertion in the production of wealth, whatever its mode.[56]
>
> Labor in fact is only physical in external form. In its origin it is mental or on strict analysis spiritual. It is indeed the point at which, or the means by which, the spiritual element which is in man, the Ego, or essential, begins to exert its control on matter and motion, and to modify the material world to its desires. As land is the natural or passive factor in all production, so labor is the human or active factor.[57]

George's distinction between land and capital is equally fundamental. One of the aspects of Crusoe's control is that he can choose among known and feasible technologies to manipulate the time paths of production and consumption. Just as individuals exert labor for the

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purpose of consuming what labor produces, so also they invest in capital for the purpose of consuming later, but (perhaps) more. Within the constraints of resources and technology, Crusoe arranges his activities over his expected lifetime in the hope of achieving the greatest achievable overall satisfaction. He can never consume any particular good before he produces it, but by producing and decumulating capital he can consume sometimes less and sometimes (later) more, relative to current production. Capital accumulation is greater or less, depending on Crusoe's decisions about how to direct his exertions. Crusoe can choose to endure a longer interval between production and consumption than he would otherwise prefer in order to exploit a technology that yields a more valuable total product for a given cost of labor and land. In that case, Crusoe earns interest, which is the purpose of his sacrifice. All production takes time, but capital yields interest only when individuals incur a subjective cost to earn it.

From an economic point of view, therefore, interest imputes to individuals just as does wages. Interest must be paid to persuade an agent to postpone consumption relative to production. Interest is the marginal return from the use of capital, the amount that just motivates the marginal investment. If the inducement of interest were not necessary because postponing consumption (relative to production) required no sacrifice, then investment would be increased to the point where the marginal product of capital diminishes to zero, and interest would be zero.

John Bates Clark, in his treatment of "primitive" economics, appears briefly to acknowledge land and labor as primary factors:

> Take away exchanges. . . . It leaves the individual man face to face with nature, and under the necessity of making a living by his efforts and her bounty. . . . [T]he economy of every man resolves itself into a process by which he indirectly serves himself, using natural material as a means.[58]

Yet Clark's description of Crusoe's economic problem does not lead him to distinguish nonproduced resources from produced wealth. The distinction between what Crusoe makes "by his efforts" and what nature provides by "her bounty" plays no part in Clark's subsequent

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analysis of distribution. Instead, he writes, "The deepest economic problems have reference to wages and interest."[59]

Clark admits that the solitary man accumulates capital by devoting a part of his labor to producing it, just as Henry George had said:

> The choice between casting a line from the shore to catch fish and working on the construction of a canoe, like the choice between climbing a tree for wild fruit and working on a spade for future gardening, is determined by exactly the same principle. . . . The principle of the final productivity of labor and capital everywhere determines how much capital it pays to accumulate.[60]

Yet Clark insists that land is part of capital even in a pure production economy. To paraphrase George, "How land is to be accumulated by saving he nowhere condescends to explain." Perhaps we are to understand that Crusoe "accumulated" the island as property merely by occupying it. So long as he is alone, however, property claims have no significance, and Crusoe devotes no resources to defending his claim.

Exchange and Property

In the Robinson Crusoe model of pure production, the outcomes of Crusoe's decisions depend largely on the quality of his information. Crusoe is disappointed when he fails to predict the cycles and vagaries of nature, when his physical or mental abilities fall short of what is needed to carry out his plans, or when he does not understand the indirect consequences of his choices. In particular, though Crusoe may be a skilled engineer with remarkable technological capabilities, if he fails to recognize the interacting ecological effects of his actions, often distant in time and space, he may irreversibly damage nature's living infrastructure of which his own artifacts are merely an embellishment.

When exchange is introduced into a production economy, the information that people have accumulated regarding the relative abundance of productive resources is dispersed among all members of the circle of exchange and is nowhere brought together for analysis by one great Crusoe intelligence. The market is the mechanism that

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broadcasts and coordinates the information that people need in order to economize. Market prices, which reflect subjective marginal valuations, set the terms of exchange on the basis of relative scarcities. The structure of prices is the social complement of the assembled information that Robinson Crusoe gathers in his solitary struggle for survival.

Economic exchanges are voluntary exchanges. If Crusoe is attacked and enslaved by a population of native islanders, he neither chooses nor economizes. The first requisite of an exchange economy is that rights and rules of property be recognized by participants within the circle of exchange. Exchange, in the economic sense, is the voluntary transfer of property rights among individuals who respect one another's choices. Individuals engage in voluntary exchanges only when they expect that their well-being will thereby be enhanced. In an exchange economy, if markets are to coordinate economic activity efficiently, the property rights structure must preserve each individual's productive incentives.

Clark agreed with George that both wages and interest should be deemed the rightful property of the individuals whose sacrifices account for them. The question at issue is how property rights to land should be assigned in an exchange economy. Clark argued, against George, that property rights in land should be divided among individuals and the state. Each owner controls one or more parcels of territory defined by surface boundaries. As we have seen, land ownership is indefinitely space-divisible but absolutely not time-divisible. Does Clark's property system preserve incentives to make land productive? George's position was that it does not; that for competitive markets to operate efficiently, "we must make land common property."[61]

In the Crusoe economy, the productive potential of land depends entirely on what nature provides, which is not only the island itself, but also all the interacting forces of the biosphere and the sunlight that energizes life on earth. Crusoe may exploit nature's opportunities for better or worse, depending on his personal abilities and his technological knowledge. Consider, however, an exchange economy in which individual decision makers control the use of bounded territorial claims, and where transaction costs prohibit individuals from

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coordinating their land use plans by private cooperative agreements. In this economy, the productive potential of any particular bounded parcel depends not only on what nature provides, but also on how people in the circle of exchange choose to use all the other bounded parcels. In an exchange economy, the potential rent income to the owner of any one parcel of land depends on the choices of other persons with respect to other parcels.

In an exchange economy with private land tenure, the market value of land is attributable to three general sources.[62] The first source is nature—the materials and forces of the universe. It is not the productivity of nature, however, but the community's demand for nature's gifts that causes rent to arise. The second source is the exchange community itself. As George emphasized, urban land values arise largely as the accidental external effects of human activity located on particular land. Those activities are undertaken with purpose, to be sure, but the external effects are not part of the purpose; they are unintended consequences, and provide no part of the incentive to undertake or avoid those activities.*

> For there is to the community also a natural reward. The law of society is, each for all, as well as all for each. No man can keep to himself the good he may do, any more than he can keep the bad. Every productive enterprise, besides its return to those who undertake it, yields collateral advantages to others. . . . The building of a house, a factory, a ship, or a railroad, benefits others besides those who get the direct profits.[63]

Just as no human purpose accounts for the natural qualities of land, so no human purpose accounts for the value of land that arises from the net externalities of actions taken throughout the community. The third cause of land value, however, is a collective purpose. Through government or other collective institutions, individuals cooperate in their land use decisions so as to increase rent. From the point of view of government or the cooperative community, the increased rent afforded by the new infrastructure that it finances is part of the return on its investment, the other part being the value of pure public goods

*If builders were compensated by others for providing net benefits to surrounding land, then the rent of that land would not increase by their efforts. In order to use the lands so benefited, one would have to pay a fee for services, which would reduce by so much one's bid price for the land.

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that are equally accessible from every location. Thus a new highway not only benefits landowners near the commercial exchanges; it also benefits everyone by making land, labor, and capital more productive.

The increased productive power of land that is generated intentionally by governments results from no choice, exertion, or sacrifice on the part of the individual landowner, assuming that he does not control the decisions of government. These benefits are therefore part of rent in an exchange economy.

The competitively determined market rent of a land parcel indicates the social opportunity cost of private land holdings. Just as rent cost tells Crusoe the minimum subjective value that any land use project must return to be worthwhile, so, in an exchange economy, the market rent of a parcel of privately held land—which is the base of George's proposed "single tax"—indicates the opportunity cost to society of acknowledging the title holder's exclusive claim. In George's single-tax system, landholders receive no special privileges from the accident of their particular location, but they share equally with everyone the net benefits of collective action.

Thus, at the foundation of economic analysis, wages and interest are payment for resources made available by what an individual's purposeful action produces, and rent is payment for resources made available to the individual for the resources and opportunities given to him. They are given by nature, which demands no payment; they are given by individuals who choose not to negotiate fees in return for the spillover benefits they generate, and therefore do not produce those benefits with any productive purpose; and they are given purposefully by government or other cooperative agencies that, for whatever reason, choose to produce benefits and donate them to private landholders at their own expense.

The Factors of Production and Natural Justice

John Bates Clark is remembered for his argument that the distribution of income is controlled by a natural law. The "general thesis" of *The Distribution of Wealth* is "that, *where natural laws have their way, the share of income that attaches to any productive function is*

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gauged by the actual product of it."[64] According to Clark, "the law on which property is supposed to rest" is "the rule, 'to each what he creates'."[65] The point of production is therefore "the point where titles originate."[66]

> To each agent a distinguishable share in production, and to each a corresponding reward—such is the natural law of distribution. This thesis we have to prove; and more hinges on the truth of it than any introductory words can state. The right of society to exist in its present form, and the probability that it will continue so to exist, are at stake.[67]

Henry George might well have assented to this statement. But for George, the agent that produces the rent share is the exchange community as a whole, and it is therefore to the community that rent should be paid. For Clark, land rent as well as interest is imputed to the action of capital. "Property is protected at the point of its origin," he said, "if actual wages are the whole product of labor, if interest is the product of capital, and if profit is the product of a coordinating act."[68]

Despite his inclusion of land with capital, nothing in Clark's theory suggests that land is produced by any action of man. His theory of property therefore accounts for property in land according to an altogether different principle. This is what might be called his "divine right" theory, according to which all land is originally the absolute property of the state. In "The Ethics of Land Tenure," Clark presents his theory of the state as a more consistent version of George's own theory of property:

> It so happens that the special assailants of the land system are defenders of the general right of property, and that they base their attack on the principle on which property rests. "To every one his product; the state has created the value of land, and to the state it belongs." We will not only admit at the outset all special rights that society may acquire as a collective producer, but we will concede the paramount right which the state has in all property. In its organic capacity it is the supreme owner of everything, the silver and the gold belong to it. If a "natural-right" theory be made to exalt the individual and depreciate the state we will have none of it. . . . The community is supposed to have created not land, but its value. We accept the fact and the principle. . . .[69]

This interpretation of George's position confuses state property with common property.[70] George's single-tax proposal would be pointless

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without the requirement that rent be shared among all members of the exchange community through the agency of cooperative government. For George, no individual can claim any greater right to rent than any other, and no "state" has any claim to rent except insofar as the state, in expressing the community's will, undertakes investments that increase the productive power of land.

> Priority of occupation give exclusive and perpetual title to the surface of a globe on which, in the order of nature, countless generations succeed each other! Had the men of the last generation any better right to the use of this world than we of this? or the men of a hundred years ago? or of a thousand years ago? Had the mound builders, or the cave dwellers, . . . or the generations still further back, who, in dim aeons that we can think of only as geologic periods, followed each other on the earth we now tenant for our little day? . . . We arrive and we depart, guests at a banquet continually spread, . . . passengers from station to station, on an orb that whirls through space—our rights to take and possess cannot be exclusive; they must be bounded everywhere by the equal rights of others.[71]

As we have seen, in an artificial world with perfect foresight, Clark's model of the ideally efficient economy is equivalent to George's single-tax proposal if, but only if, the rental value of land is expended on behalf of the whole community. Clark denies, however, that individuals have any right to land or its rent except through purchase. "We leave out of account all land obtained by force or fraud," he said. "We limit our studies to the area where real estate is bought and sold like any commodity."[72] Since land cannot be produced, the state can come into possession only by first occupation, by evicting previous occupants, or by purchasing land from previous claimants. Even if the state originally acquired possession by force or fraud, said Clark, that is no reason to deny its present claim:

> In America the government originally held the land. Conceding to Indians a right of occupation, it extinguished that right by a series of treaties. If there was injustice in the manner in which this was done,—and there is no need of denying that there was,—the responsibility for it rests on the state as a whole, and would not be righted by further seizures by the government which was the offending party.[73]

Clark did not say or who or what "the state" is understood to be, or explain how competing claims are to be adjudicated. If multiple

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groups lay claim to the same territory, his theory gives no indication as to which represents the legitimate government. Although he insisted that democratic governments generally do act on behalf of the public interest, he imposes no requirement that they do so to earn legitimacy. Moreover, though the state is the "original" owner of land, it commits no injustice by giving land to privileged individuals. The state has the absolute right to sell or give exclusive land rights to whomsoever it pleases for any reason or whim. Whether the motive is to reward political allies or to promote the general welfare; whether the action is purposeful or capricious—all transfers of land to persons are permissible, perpetual, and irrevocable, in Clark's view. Whenever the state alienates land to a private owner, absolute rights are transferred, and the state is thereafter prohibited from infringing on the absolute right of the private landowner. The individual owner, of course, may in turn sell, give or bequeath his property to any other individual or to the state.[74]

There must be no restrictions in the market for land, said Clark, except the restriction that land parcels must be transferred in perpetuity. Once the state has alienated any parcel of land, it can never reestablish its original claim. It may not resume title. It may not impose a special tax on the value or rent of land, because this would be wrongfully to steal the value that it had duly transferred in good faith. If the state's good governance causes the rent of privately owned land to increase beyond early expectations, then the windfall gains it bestows upon some persons represent no injustice to others. Land titles, legitimized by the state, entitle owners to receive all future net benefits of geographically identified parcels.

Clark's discussion seems to imply that that *any* government action that diminishes the value of any parcel of privately owned land, without compensation, is unacceptable. Thus the state may freely engage in actions that increase the rent income of individuals, but may engage in no action that decreases or redistributes the rent income of individuals. The absolute power of the state is thus commuted to an absolute power of a subset of its citizens.

Clark does not say whether taxes that reduce the net wages of labor, the interest of capital, or the profits of enterprise represent any injustice. Presumably, they do not; the state evidently has the right to

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exist, so it must have the right to command resources from some source. Perhaps Clark would argue that, whereas an individual's title to land is justified by a solemn contract between the state and the landowner, no such contract underlies an individual's right to keep the earnings he individually produces by working, investing, planning, and inventing. Thus a tax on rent may represent a violation of justice while a tax on other incomes does not. Clearly, however, such a conclusion vitiates the ethical interpretation of marginal productivity from which Clark began.

In short, Clark's conception of natural justice is deficient both in its theoretical structure and in its practical consequences. Clark's divinely empowered "state" appears to be little more than a collusive association of landlords acting on their own behalf.

By contrast, George's theory of natural justice is at least complete and consistent, whether or not one accepts his ethical premise. According to George, individuals have equal rights of access to the bounty of nature. Land is understood to be the common property of all persons within the circle of exchange, including future generations.

> Well may the community leave to the individual producer all that prompts him to exertion; well may it let the laborer have the full reward of his labor, and the capitalist the full return of his capital. For the more that labor and capital produce, the greater grows the common wealth in which all may share. And in the value or rent of land is this general gain expressed in a definite and concrete form. Here is a fund which the state may take while leaving to labor and capital their full reward.[75]

George and Clark agreed that wages and interest are paid to individuals in consideration for the value added by individuals. Consistently, George's single-tax system exempts wages, interest, and entrepreneurial profits from taxation because they are recognized as the rightful property of the individuals who produce them. Moreover, the single tax treats rent symmetrically with wages and interest: Rent is paid to the whole community, that is, to everyone within the circle of social exchange, in consideration for the value added by the community. George believed that if Smith's "invisible hand" is to function properly and markets are to serve the public interest, then just as the values produced by individuals must be returned to those individu-

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als, so also must rent be paid to the community whose collective actions give land its value. The single-tax system assigns property rights so as to preserve economic incentives. "In justice," said George, "is the highest and truest expediency."[76]

If rent is paid to individual land owners holding territorial claims, as Clark recommended, then individuals have an incentive to expend resources unproductively in rent-seeking. If claims are assigned and enforced by governments, rent-seeking will take the form of collusion between individuals and government officials. Successful rent-seekers direct the gains from public investment into their own pockets.

If, however, rent is paid to the community whose collective activities give value to land, then individuals have incentives to cooperate with one another in their use of land. Each member maximizes his proportional share of rent by helping to ensure that land uses are complementary, each parcel enhancing the value of neighboring lands'.

If rent is paid to the government to finance public services, then government has an incentive to produce services that generate rent. Government maximizes its own revenue by producing a mix of services that raises aggregate rent by more than its cost, by as much as possible.

If rent is paid to every citizen of the planet by virtue of his equal rights to nature, then everyone has an incentive to cooperate globally to ensure that the productivity of nature is not unduly compromised by the collective activities of humankind. If people who are alive agree among themselves that they are obligated to preserve the natural resources of the earth for use by future generations, then they have an incentive to cooperate globally to ensure that sustainable technologies are chosen.

George held that the practical consequences of his proposal would be beneficial to society on many levels. Though motivated by fundamental ideas about social justice, the single-tax policy was supported by positive theory about the economic and social implications of alternative property arrangements. George argued that the institution of perpetual private property in land creates not only distributive inequality but also economic inefficiency, slow growth, and cyclical instability. When rent taking is available as an alternative to

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production as a way of getting wealth, resources are wasted by individuals whose choices are based on distorted incentives. Economic inequality gives rise to further inefficiency because of its depressing effect upon the productive incentives of the working poor and the nonworking rich. Moreover, warned George, inequality of wealth inevitably translates into inequality of political power, even under democratic institutions. Private property in land is incompatible with political liberty and equality.

> Where there is anything like an equal distribution of wealth . . . the more democratic the government the better it will be; but where there is gross inequality in the distribution of wealth, the more democratic the government the worse it will be; for, while rotten democracy may not in itself be worse than rotten autocracy, its effects upon national character will be worse. . . . To put political power into the hands of men embittered and degraded by poverty is to tie firebrands to foxes and turn them loose amid the standing corn; it is to put out the eyes of a Samson and to twine his arms around the pillars of national life.[77]

The Legacy of John Bates Clark

This chapter has argued that George's identification of land and labor as the original factors of production is coherent and defensible. At the analytical starting point, every productive process employs the primary inputs of labor and land as Henry George defined them. Land is indispensable to production and to all earthly life. George's three-factor taxonomy is consistent with the fundamental methodology of economics. It underlies a coherent philosophy of natural justice and provides an elegant theoretical framework for addressing social, political and ecological as well as economic issues.

Clark's theory of capital confuses value from production with value from obligation, and social wealth with private wealth. This leads him to conclude that land is capital because it can be exchanged for capital, that saving can increase the supply of land, that capital "transmigrates" into land, and that an increase in land prices constitutes an increase in wealth. Clark's perfect foresight model of static equilibrium defines unearned gains and losses out of existence, slamming the analytical door on George's entire dynamic analysis of distribution and social development. By reinterpreting the theory of differential

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rent in terms of marginal analysis with homogeneous land/capital, Clark overlooks George's location theory of urban land rent. Neither his marginal productivity analysis nor his static equilibrium model explicitly incorporates the productive contribution of time in the theory of capital and interest.

John Bates Clark put out of view the fundamental economic condition of humankind—the fact that all production requires the purposeful application of human effort to the materials and forces of nature. By including land with capital in his marginal productivity theory of distribution, he assumed that land and produced capital goods are perfect substitutes in production, implying that production could proceed without land by substituting machines for land. This is of course impossible, because capital goods are composed of materials drawn from land. Let the whole surface of the earth be modified by the touch of the human hand; marginal productivity is the principle that distinguishes the value added by labor from the underlying value of land.

In short, Clark's favored strategy against the single tax is simply to ignore most of George's theory and evidence, the gaps in his own argument, and the obvious counterarguments. His favored device for doing so is to choose analytical models that assume away the economic conditions on which his opponent's argument is based.

Yet despite its errors and omissions, Clark's view of land, capital, and property ultimately became the backbone of neoclassical economics, which, through Alvin S. Johnson, Frank Knight, and others, came to dominate the profession during the twentieth century.[78]

There seem to be at least three versions of Clarkian economics alive today. On the political right are the admirers of privatization. The flag bearer for this group is the Chicago School, which addresses every social problem by proposing to restore the missing property rights that account for it. On the political left are the proponents of a view akin to the divine right theory of the state, according to which all property is what government defines it to be by its taxes and subsidies, spending and investment, rules and regulations.[79] This group would reject George's central insight—the distinction between the value of what individuals contribute (wages and interest) and the value of what the whole community contributes (rent)—which forms

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the basis for George's general theory of governance and public finance.

Finally, there are the vast numbers of everyday economics professors who year after year teach millions of undergraduates the two-factor theory of production. Casually, perhaps for no better reason than that the blackboard can depict only two dimensions, they model business firms as employing combinations of "Labor" and "Capital" to produce output in a timeless microeconomic model. Undergraduates today would not only recognize Clark's marginal productivity diagrams; they would be able to supply the equations that underlie them. Most students would not, however, be able to explain why the distinction between reproducible and nonreproducible resources is important in the functioning of the macroeconomy, and (whatever their political opinions concerning "capitalism") they would not be able to state clearly what capital is or what capital does.

In recent decades many economists have begun to address the growing problems of environmental pollution, resource depletion, and ecosystem disturbance. Finding no accepted economic term for the nonreproducible materials and forces of nature, some have latched upon the unfortunate phrase "natural capital."[80] It remains to be seen whether the global ecological crisis will move economists to rediscover George's theory of natural justice—despite the proven success of J. B. Clark's strategy to define land out of existence.

Notes

1. Henry George, *The Science of Political Economy* (1898; New York: Robert Schalkenbach Foundation, 1980), p. 204.
2. Ibid., p. 203.
3. Ibid., p. 206.
4. Ingrid Hahne Rima, *Development of Economic Analysis*, 5th ed. (New York: Routledge, 1996), p. 202.
5. George, *The Science of Political Economy*, p. 207.
6. Rima, *Development of Economic Analysis*, p. 277.
7. John Bates Clark, *The Philosophy of Wealth* (Boston: Ginn & Co., 1886), pp. 1–2.
8. Rima, *Development of Economic Analysis*, p. 277.
9. Clark, *The Philosophy of Wealth*, p. 126.

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10. Joel Jalladeau, "The Methodological Conversion of John Bates Clark," *History of Political Economy* 7 (Summer 1975), pp. 209–26.

11. Mason Gaffney, "Neoclassical Economics as a Stratagem against Henry George," in Mason Gaffney and Fred Harrison, eds., *The Corruption of Economics* (London: Shepheard-Walwyn, 1994), p. 49.

12. Ibid.

13. John Bates Clark, *The Distribution of Wealth: A Theory of Wages, Interest and Profits* (1899; New York: Augustus M. Kelley, 1965), p. vii.

14. John Bates Clark, "The Ethics of Land Tenure," *International Journal of Ethics* 1 (October 1890): 62–97.

15. Clark, *The Distribution of Wealth*, p. 190.

16. George, *The Science of Political Economy*, p. 208.

17. Frank A. Fetter, "Clark's Reformulation of the Capital Concept," in *Economic Essays Contributed in Honor of John Bates Clark*, ed. Jacob Hollander (New York: Macmillan, 1927), reprinted in *Capital, Interest and Rent: Essays in the Theory of Distribution* by Frank A Fetter, ed. Murray N. Rothbard (Kansas City: Sheed, Andrews and McMeel, 1977), pp. 126–28.

18. Simon Nelson Patten, "The Conflict Theory of Distribution," *Yale Review* (August 1908), reprinted in *Essays in Economic Theory*, ed. Rexford G. Tugwell (New York: A. A. Knopf, 1924), p. 219.

19. George, *Science of Political Economy*, p. 203.

20. Henry George, *Progress and Poverty* (1879; New York: Robert Schalkenbach Foundation, 1981), p. 12. See also Nassau Senior, *Outline of the Science of Political Economy*, 6th ed. (1836; London: Allen & Unwin, 1872).

21. Rima, *Development of Economic Analysis*, pp. 149, 178, 190–91.

22. Nicolaus Tideman, "The Economics of Efficient Taxes on Land" in *Land and Taxation*, Nicolaus Tideman, ed. (London: Shepheard-Walwyn, 1994), pp. 103–21.

23. John Stuart Mill, *Principles of Political Economy*, 7th ed. (1848; New York: Augustus M. Kelley, 1987), p. 797.

24. Gaffney, "Neoclassical Economics as a Stratagem against Henry George," p. 47.

25. George, *Progress and Poverty*, p. 38.

26. Clark sensed the logical difficulty in measuring real inputs by summing their market values, and attempted to develop a theoretically absolute measure of aggregate real capital by appealing to the fundamental identity of utility and cost. *The Distribution of Wealth*, chap. XXIV.

27. Ibid., p. 116.

28. Ibid., p. 118.

29. Ibid., pp. 119–20.

30. Ibid, p. 117.

31. Ibid., p. 118.

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32. George, *Progress and Poverty*, p. 199.

33. Mason Gaffney, "Land as a Distinctive Factor of Production," in Tideman, ed., *Land and Taxation*. Gaffney points out the circularity of Clark's argument in "Neoclassical Economics as a Stratagem against Henry George," pp. 68–69.

34. Clark, *The Distribution of Wealth*, p. 116.

35. Ibid., p. 191.

36. George, *Progress and Poverty*, p. 26.

37. Ibid., p. 51.

38. Ibid., pp. 218–20.

39. Ibid., p. 255.

40. Ibid., pp. 263–81. Credit transactions represent "value from obligation" (see below).

41. Clark, *The Distribution of Wealth*, p. 37.

42. Ibid., p. xiv.

43. Clark, "The Ethics of Land Tenure," p. 68.

44. Ibid., p. 75.

45. Clark, *The Distribution of Wealth*, p. 37.

46. George, *Progress and Poverty*, pp. 35–36.

47. George, *The Science of Political Economy*, p. 258.

48. Ibid., pp. 257–69.

49. George, *Progress and Poverty*, p. 41.

50. Ibid., pp. 39–40.

51. George, *The Science of Political Economy*, p. 260.

52. Ibid., pp. 268–69.

53. George used a model of pure production to refute the wages-fund theory, which held that wages are paid from the accumulated capital of employers. *Progress and Poverty*, p. 72.

54. Ibid., p. 336.

55. George, *Progress and Poverty*, p. 163.

56. George, *The Science of Political Economy*, p. 411. Italics added.

57. Ibid., p. 412.

58. Ibid., p. 41.

59. Ibid., p. 46.

60. Ibid., pp. 48–49.

61. Ibid., p. 328.

62. Tideman, "The Economics of Efficient Taxes on Land," pp. 130–34.

63. George, *Progress and Poverty*, p. 435.

64. Clark, *The Distribution of Wealth*, p. 3.

65. Ibid., p. 9.

66. Ibid.

67. Ibid., p. 3.

68. Ibid., p. 9. Elsewhere, Clark follows George in arguing that competitive equilibrium is defined by the condition of zero profit.

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69. Clark, "The Ethics of Land Tenure," pp. 63–65.

70. Kris Feder, "Henry George on Property Rights: Reply to John Pullen," *American Journal of Economics and Sociology* 60 (April 2001): 565–79.

71. George, *Progress and Poverty*, pp. 344–45.

72. Clark, "The Ethics of Land Tenure," p. 63.

73. Ibid., p. 69.

74. Ibid., p. 71.

75. George, *Progress and Poverty*, p. 436.

76. Ibid., p. 367.

77. Ibid., p. 532.

78. Gaffney, "Neoclassical Economics as a Stratagem against Henry George."

79. See Liam Murphy and Thomas Nagel, *The Myth of Ownership: Taxes and Justice* (New York: Oxford University Press, 2002).

80. See Gretchen C. Daily and Katherine Ellison, *The New Economy of Nature* (Washington, D.C.: Island Press/Shearwater Books, 2002); also Annmari I. Jansson, ed., et al., *Investing in Natural Capital: The Ecological Economics Approach to Sustainability* (Washington, D.C.: Island Press, 1994).

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