



## Walras's Economics as Others See It

William Jaffe

*Journal of Economic Literature*, Vol. 18, No. 2 (Jun., 1980), 528-549.

Stable URL:

<http://links.jstor.org/sici?sici=0022-0515%28198006%2918%3A2%3C528%3AWEAOSI%3E2.0.CO%3B2-H>

*Journal of Economic Literature* is currently published by American Economic Association.

---

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/about/terms.html>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/journals/aea.html>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

---

JSTOR is an independent not-for-profit organization dedicated to creating and preserving a digital archive of scholarly journals. For more information regarding JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

# Walras's Economics As Others See It

*Così è (se vi pare)*

—LUIGI PIRANDELLO

By WILLIAM JAFFÉ

*York University*  
*Canada*

*I owe particular thanks to my colleague, John Buttrick, for editorial guidance and for insights into analytical subtleties that had escaped me. I am no less grateful to Samuel Hollander, Robert Clower, Claude Ménard, Stephen Ferris, Charles Plourde, and John Worland, who commented helpfully on earlier versions of this article. To the Social Sciences and Humanities Research Council of Canada I am deeply indebted for continuing research grants.*

IN THIS ARTICLE, as in my brief review of Michio Morishima's *Walras' Economics: A Pure Theory of Capital and Money*<sup>1</sup> for the *Economic Journal*, the question is whether Morishima's interpretation of Walras's model is correct or whether his extensions, emendations, and corrections of the original model, designed to bring it in line with modern theoretical interests, distort the historical record. Let me say at once that Morishima's argument is by no means valueless for being flawed from the historian's point of view. On the contrary, such is the brilliance and analytical penetration of his

misinterpretations that their very contrast with the original brings into sharp relief important but hitherto neglected aspects of Walras's theoretical writings.

At the outset of his preface to *Walras' Economics* (p. VII),<sup>2</sup> Morishima expresses the hope that he "will not . . . give the reader a distorted view of Walras" by focusing attention exclusively on the *Éléments* (1874 . . .), without reference to Walras's other writings. A hope, however, is not a demonstration. The fact, which Morishima notes, that Léon Walras left his studies (*Études*) in applied and "social" economics in the form of two volumes of collected papers (1898; 1896) instead of systematically organized treatises

<sup>1</sup> Morishima (1977). My critique is restricted to a discussion of Morishima's reading of Walras and does not extend to an evaluation of his own theory of capital and money for which Walras is taken as the point of departure.

<sup>2</sup> The page numbers in parentheses (p. . . .) refer to Morishima (1977).

is no proof of their irrelevance to an understanding of Walras's "theoretical kernel," as Morishima calls it. Morishima makes no mention of several other writings of Walras or of the recent publication of his private economic letters and papers (Bousquet, 1964; Jaffé, 1965) as potential sources of illumination of the "kernel" in question.

Morishima's decision to look no further than the *Elements of Pure Economics* in order to capture the essence of what is worth preserving of Walras's contributions has a long tradition. Vilfredo Pareto, who acknowledged Walras's formal pure theory as his principal source of inspiration, repeatedly denounced everything else in Walras's work as futile metaphysics.<sup>3</sup> Sir John Hicks, in his *Econometrica* article of 1934 on "Léon Walras," dismissed Walras's writings in applied economics, including, odd as it may seem, the theory of money, as "relatively uninteresting" (1934, p. 347). According to Hicks, "it was in pure economics that his [Walras's] real interest lay, and the discovery of the conditions of static equilibrium under perfect competition was his central achievement." Hicks did not deign to mention the "social economics." And Joseph Schumpeter, in his deeply moving obituary on the death of Walras in 1910, maintained a discreet and complete silence on everything Walras had ever written apart from pure theory. What Schumpeter really thought of Walras's *political*, rather than *pure*, economics came out later, in the *History of Economic Analysis*, where he wrote: "Unfortunately, Walras himself attached as much importance to his questionable philosophies about social justice, his land-nationalization scheme, his projects of monetary management, and other things that have nothing to do with his superb achievement in pure the-

ory. They have cost him the goodwill of many a competent critic, and must, I imagine, try the patience of many of his readers" (1954, pp. 827-28).

It is surprising that Morishima should have fallen in with the tradition established by Pareto, Hicks, and Schumpeter. In his other books, especially in *The Economic Theory of Modern Society* (1976), Morishima displays a sensitive awareness of the broader historical, sociological, and ideological setting of the formal economic theories considered. The nearest he comes to taking so broad a view in his *Walras' Economics* is to allege that Walras's general equilibrium model was founded on a "four-class view of society" (pp. VIII and 125), the four classes being workers, landowners, capitalists and entrepreneurs—with entrepreneurs playing an important decision-making role as Morishima sees it (p. 7). Unfortunately this attribution to Walras of a four-class conception of society with entrepreneurs in a decision-making role is sheer invention and a distortion of the record.

If Morishima had availed himself of what he calls "the full story of Walras' economics," he would have learned that instead of a four-class view of society, which Morishima regards as "more advanced than Marx's two-class view" (p. 9), the Walrases, father (Auguste Walras) and son, also held a two-class view, but an altogether different one from that of Marx. Though the Walrases, like Marx, envisaged their two classes in conflict, their idea of the composition of the classes and of the nature of the struggle was far removed from that of Marx. They saw the class struggle as a conflict between landowners and private proprietors of natural monopolies on the one side and all the rest of society, *including entrepreneurs and capitalists*, on the other.<sup>4</sup> As for the role of the entre-

<sup>3</sup> E.g.: Guido Sensini (1948), p. 61; G. De Rosa (1960), vol. III, p. 121; and Vilfredo Pareto (1935), § 1732, n. 2 and § 2129, n. 1.

<sup>4</sup> This view of class conflict was rooted in a distinctively French tradition of which an excellent account is found in E. Allix (1913).

preneur in Walras's analytical model, the *Eléments* restricted it to that of arbitrageur, and nothing else. But of this more anon.

Where, in my estimation, Morishima got off on the wrong foot was in supposing that "the ultimate aim [of Walras's *Eléments*] was to construct a model, by the use of which we can examine how the capitalist system works" (p. 4). That, I contend, was not the aim of the *Eléments*, either ultimate or immediate. In my recent article, "The Normative Bias of the Walrasian Model: Walras versus Gossen" (1977), textual evidence is presented to show that the *Eléments*, instead of aiming to delineate a theory of the working of any real capitalistic system, was designed to portray how an imaginary system *might* work in conformity with principles of "justice" rooted in traditional natural law philosophy,<sup>5</sup> though the system remained subject to the same forces, the same "passions and interests," and the same material and technological constraints that govern the real world. The *Eléments* was intended to be and is, in all but the name, a realistic utopia, i.e., a delineation of a state of affairs nowhere to be found in the actual world, independent of time and place, ideally perfect in certain respects, and yet composed of realistic psychological and material ingredients.<sup>6</sup>

This view of the *Eléments* is diametrically opposed to that of Morishima and indeed to that of all twentieth century

commentators on Walras's economics I am aware of. Since Walras was not always consistent or explicit in his approach, appeal against my view can be made by citing such passages in the *Eléments* as, for example, "my [Walras's] theory of capital formation . . . is indeed the abstract expression and rational explanation of facts of the real world."<sup>7</sup> This sentence is a translation of a passage in the fourth edition of the *Eléments* (1874 . . . , pp. xvii-xviii), which Walras claimed he was quoting without any change from the preface to a second edition. It so happens that that was not the case. In the second edition, the excerpted words read in fuller context: ". . . ma théorie de la capitalisation . . . est bien [ce qui doit être une théorie de cette nature:] l'expression fidèle et l'explication exacte des phénomènes de la réalité" (1874 . . . , p. xxii). This, in fact, was not what he reproduced in the fourth edition, but rather a revision of the sentence made for the third edition, the revision reading, "ma théorie de la capitalisation . . . est bien [ce qui doit être une théorie de cette nature:] l'expression abstraite [in place of 'fidèle' of the second edition] et l'explication rationnelle [in place of 'exacte' of the second edition] des phénomènes de la réalité." This was clearly more than a bit of stylistic polishing: the change makes a world of difference—all the more so because his idealization of reality was dictated not only by a desire "for simplicity" or analytical con-

<sup>5</sup> For a full-dress account of Walras's social philosophy, see Marcel Boson (1951) and for further bibliographical references on the subject, see Jaffé (1975), p. 813, n. 1.

<sup>6</sup> In an early paper, "Méthode de conciliation ou de synthèse," written in 1868 and repeatedly echoed in later writings, Walras plainly stated, "In science, our domain is that of ideas, of the ideal, of perfection. Nothing prevents us from defining, i.e. sifting out of experience by abstraction, the idea of social wealth, of capital and income, of productive services and products, of landowners, workers and capitalists, of entrepreneurs, of the market and prices . . ." (Walras, [1896] 1936, p. 187; my translation). And

again, under a significant subheading, "Synthèse de l'utilitarisme et du moralisme," in the same paper, Walras went on to say, ". . . if the relative or perfectibility pure and simple is the hallmark of politics, the absolute or rigorous perfection is the hallmark of science. We are now in the domain of science; and therefore, in this domain, we look for the absolute or perfection. Semi-utility or near justice will not do; we must have complete utility or justice entire and full" (Walras, [1896] 1936, p. 188; my translation).

<sup>7</sup> Walras (1874/ . . . ), p. 46 of the English translation (1954).

venience but also by Walras's aim to depict his "idéal social" as a "synthèse de l'utilitarisme et du moralisme."

Of course, the words "l'expression . . . et l'explication . . . des phénomènes de la réalité" occur in both versions; but this only confirms Walras's constant preoccupation with creating a model of a terrestrial utopia in contrast with the otherworldly utopias of the early French socialists.<sup>8</sup> In repeatedly calling attention to the realism of the ingredients of his model, Walras meant to furnish a theoretical foundation for a rationally conceived program of remedial measures, which he called (or miscalled) "scientific socialism." From edition to edition, the *Eléments* reflected Walras's purpose in ever purer form: to devise "an *abstract* expression and *rational* explanation of facts of the real world," rather than "a *faithful* expression and *exact* explanation" of these facts [italics added]. When in the course of the successive distillations of his pure theory, Walras kept recalling the real-world source of his distillate, it was not to return to the real world for the sake of explaining how it works, but to show that the world of his ideal model, in its mathematical formulation, was still made up of perfectly real components after unwanted or unneeded impurities had been left behind in the retort.

Morishima mistakes Walras's verbal specification of unwanted residues for aspects of reality that Walras left out of his equations only because he did not have sufficient mathematical skill to incorporate them into his formal schema of general equilibrium (p. 10). There is no doubt that Walras's mathematical prowess was quite limited, as he himself admitted.<sup>9</sup> It is, however, one thing to refine, correct, and modernize Walras's prolix, intuitive,

and relatively primitive mathematics or to introduce needed emendations in analytical detail (such as the substitution of a composite commodity in the place of Walras's unsatisfactory *numeraire*) (Morishima, 1977, pp. 32–33), but it is quite another thing so to exploit the resources of latter-day mathematics as to give a different direction to Walras's theory than the one originally intended.

The question, therefore, is how to find out what Walras intended by his *Eléments*. On this point the *Eléments* itself is not clear; indeed it is ambiguous and ambivalent enough to furnish some support for Morishima's contention that Walras's "ultimate aim" was "to construct a model by the use of which we can examine how the capitalist system works." As George Stigler has taught us, when quotations and inconsistent counter-quotations abound, "textual interpretation must uncover the main concepts in the man's work, and the major functional relationships among them. . . . This rule of consistency with the main conclusions may be called the principle of scientific exegesis" (1965, p. 448). I should go further and consult not only "the man's work," but also the *Zeitgeist* in which "the man's work" was conceived.

When Walras declared in one of his last utterances that he had, from the beginning, considered it the purpose of pure economics to present a rigorously rational solution of "la question sociale" as an indispensable preliminary to the prescription of policy measures (1909, p. 587), he was not only rejecting the crude empiricism of which he accused the socialists of his day, but was faithfully following a tradition established by the "philosophes" of eighteenth-century France who were, above all, believers in the sovereign efficacy of systematized reason in coping with social and political problems. From his first full-length publication in economics

<sup>8</sup> Cf., Walras ([1896] 1936), p. 5 and A. Duvillier (1956).

<sup>9</sup> See Jaffé (1965), vol. 2, p. 450, Letter 1010.

(1860) to his closing reflections on his life work (1909), Walras posed "la question sociale" in terms of social schemes for correcting the flagrantly unjust distribution of property that reduced the laboring masses to life-long desperate poverty.<sup>10</sup> Repelled by the philosophical and scientific shortcomings of the "socialists" in coping with this problem, Walras's father had turned to conventional political economy, which he found equally disappointing; and so did Léon Walras after him. Father and son sought to transform classical political economy into a science that could serve as an intellectual basis for the needed reform of society. The *Éléments* was, consequently, designed, not as a "study of men as they live and move and think in the ordinary business of life" (Marshall, 1920, Book 1, chap. 2, § 1), but as a theoretical representation of a just economy from the standpoint of "commutative justice"; "distributive justice" called for separate treatment in the *Études d'économie sociale*.<sup>11</sup>

When Walras defined his *pure economics* as, "in essence, the theory of the determination of prices under a hypothetical regime of perfectly free competition,"<sup>12</sup>

<sup>10</sup> Professor Claude Ménard of Paris reminds me that in nineteenth-century France, "la question sociale" embraced a whole gamut of social, political, and ideological, as well as economic, instabilities and conflicts generated by the "industrial revolution." Cf., A. A. Cournot (1877), pp. 278–325.

<sup>11</sup> Walras (1896). The disassociation of pure economics from normative considerations, which Walras enunciated in § 4 and § 223 of the *Éléments*, turns out, when read in the total context of part I and § 223, to be a disassociation solely from issues of "distributive justice" inherent in the distribution of property, and not of "commutative justice" latent in any particular organization of market trading. "Commutative justice" in the traditional Aristotelian-Thomistic sense relates to acts of voluntary exchange in which the market value received is equal to the market value given up, thus excluding money gains to any party from trading; whereas "distributive justice," applied, say, to the award of prizes, is characterized by proportionality to superior performance, without any connotation of equivalence.

<sup>12</sup> Walras (1874 . . .), p. XII of the second edition and repeated in all subsequent editions; see also

i.e., under a regime of strictly atomistic competition unexampled at any time in history, he chose a hypothesis that, in effect, precluded all gains (or losses) from trade in terms of *numéraire*. Under his assumption of perfectly free competition, "commutative justice," which would contribute to the welfare of the laboring poor, could be achieved—at least in principle. The market system, if perfectly competitive, could be shown to work automatically in the desired direction, though by itself it achieved only half of justice, the other half, "distributive justice," requiring appropriate and deliberate institutional reform in the distribution of property.

It is clear that Walras had no liking for realism as such. In fact, he vehemently denounced it in all its manifestations: in art and in literature as well as in philosophy, science, and economics.<sup>13</sup> At the same time, he recoiled from pure idealism. He preferred to take the position of a "synthesist," with the object of reconciling what is best in opposing schools, thereby creating a new entity. This passion for reconciling polar opposites permeated Walras's pure economics as it did virtually every subject he touched on in his writings.<sup>14</sup> His point of view, as he once

§§ 221–22 of the definitive edition and p. 585 of the English translation, Collation Notes [a]–[d] to Lesson 22.

<sup>13</sup> Walras (1896), pp. 24–171, "Théorie générale de la société"; and pp. 175–202, "Méthode de conciliation ou de synthèse."

<sup>14</sup> Nowhere is this point of view more succinctly advocated by Walras than in his "Chroniques de la quinzaine" that he contributed to the *Gazette de Lausanne* from 12 January 1878 to 18 May 1878 over the pseudonym "Paul." See Jaffé (1965), vol. I, pp. 559–60, notes (4) and (5) to Letter 401.

If we may judge from an undated manuscript in Walras's hand, which Professor Gaston Leduc, who had inherited it from Walras's daughter, passed on to me, Walras, in his early youth, to which I attribute the manuscript, leaned toward idealism and was certainly skeptical then, as he remained through his life, of the value of accumulations of descriptive statistics so much in vogue in his day. The manuscript reads:

I am an idealist. I believe that ideas reshape the world after their own image and that the

described it,<sup>15</sup> was that while it is true that theoretical systems unrelated to observation and experience are bound to be as empty, shallow, and false as are representations in art completely devoid of reality, it is no less true that reality, observation, and experience, however indispensable to science as to art, serve only as a point of departure, or rather a foundation on which to mount creations of abstraction and imaginative invention. This position, which impressed upon Walras's *Éléments* the character of what I have called a realistic utopia, is not simple, but riddled with complexities inherent in the intellectual controversies that raged in Walras's day. From the historical standpoint, it is within this setting of the intellectual life of nineteenth-century France that the *Éléments* needs to be interpreted. To interpret it in a later setting (say, of a twentieth-century London School of Economics) is to commit a flagrant anachronism.

Walras's method of molding reality into an ideal fiction of "commutative justice" subject to economic efficiency is nicely illustrated by the role he assigned to his entrepreneur within the play of market forces under perfect competition. As Mor-

ishima sees it, Walras was guilty of an inconsistency in identifying the entrepreneur with the capitalist-investor in his mathematical model while holding, at the same time, a "four-class view of society" in which entrepreneurs constitute a class apart, one of whose functions it is to make investment decisions (p. 7). Actually, Walras did neither. We have already seen that he held no "four-class view of society." It remains to show that his mathematical model neither expressed nor implied any identification of the entrepreneur, *qua* entrepreneur, with the capitalist-saver, and could not do so without destroying the essential character of the model.

The source of Morishima's misinterpretation lies, I suspect, in his failure to take due account of Walras's special use of the French term *profits* to designate the capital-services *in kind* yielded by capital goods (§§ 172 and 232),<sup>16</sup> not the value of these services in money or *numéraire*, and certainly not what is usually meant by *profits* in French or by "profit" in English.<sup>17</sup> For gain in the form of a positive difference between selling price and cost, Walras used the word *benefice*, a synonym of *profits* in everyday French and generally translatable as "profit" in En-

---

ideal a man conceives for his century commands the attention of all humanity. I believe that the world has striven without success for eighteen centuries to realize the ideal of Jesus and the first of the Apostles. I believe that the world will take another eighteen, or perhaps twenty, centuries, in trying, without better success, to realize the ideals of 1789, which we now perceive more clearly and which our successors will illuminate. How happy would I be if I could imagine that I had shed one ray of light, however small, on this vision. In this respect, I am swimming against the current of my century. Facts are now in fashion: the observation of facts, the investigation of facts, the acceptance of facts as laws. In stormy times, political power falls into the hands of the ignorant masses. Art, science, philosophy are swept away. Facts become masters; empiricism triumphant reigns supreme. Analytical minds closely study the explosion and wait for chaos gradually to take over as an object of fond description and serene glorification. As for me, I will have no part in this. It is possible

---

that my ideal is narrowly conceived. But it is less so than my halting expression of it would lead one to believe. However that may be, I take comfort in my ideal—it is my refuge against the avalanche of brute facts; and if my century crushes me, as the universe Pascal's reed [Pascal had referred to man, though weak and miserable, as a thinking reed, still thinking despite being crushed by the universe], at least I shall have been spared being part of the century. I shall have lived in the past and in the future. [My translation with the assistance of my colleague, Professor C. Edward Rathé.]

**Editor's note:** The text of this quotation in the original French is in an appendix at the end of this article.

<sup>15</sup> *Gazette de Lausanne*, January 12, 1878: "Chronique de la quinzaine."

<sup>16</sup> Unless otherwise indicated, both in the text and in these notes, the section numbers preceded by the symbol § are those of the definitive edition of the *Éléments* or the English translation.

<sup>17</sup> See Walras (1874), English translation, p. 525: Translator's Note [2] to Lesson 17.

glish. When, therefore, Walras defined *his* entrepreneur as "a fourth person, entirely distinct from . . . [the landowner, the worker and the capitalist], whose role it is to lease land from the landowner, hire personal faculties from the labourer, and borrow capital from the capitalist, in order to combine the three productive services in agriculture, industry and trade" (§ 184), and when he said that "in a state of equilibrium, *les entrepreneurs ne font ni bénéfices ni pertes*" ("entrepreneurs make neither profit nor loss," § 188),<sup>18</sup> he did not mean that there are no returns to capital in a state of equilibrium, but only that there is nothing left over for the entrepreneur, *qua* entrepreneur, when selling price equals *all* costs of production including the cost of capital-services for which payment is made to capitalists. It should be noted that in Walras's formal theory, capitalists alone decide, by virtue of their right of ownership, in what physical form their savings are embodied.

Of course, Walras's entrepreneur is not precluded from simultaneously assuming other roles. As Walras put it: "It is undoubtedly true that, in real life, the same person may assume two, three, or even all four of the above-defined roles. In fact, the different ways in which these roles may be combined give rise to different types of enterprise. However that may be, the roles themselves, even when performed by the same individual, remain distinct. From the scientific point of view, we must keep these roles separate and avoid both the error of the English economists who identify the entrepreneur with the capitalist and the error of a certain number of French economists who look upon the entrepreneur as a worker charged with the special task of managing a firm" (§ 184). It is solely in his role as entrepreneur that he is destined in equi-

librium to "make neither profit [i.e. *bénéfices*] nor loss."

Why, then, should anyone want to be an entrepreneur if he is denied any reward or share in the national income for the trouble he takes in buying productive services and selling products? Walras's answer was that in the real world, which is rarely, if ever, in full economic equilibrium, one stands a fair chance of making a *bénéfice* by what amounts to arbitrage transactions (§§ 188 and 273).<sup>19</sup> In Walras's model, his "fourth person" acts like a catalytic agent, taking no part in the conversion of productive services into products, but merely standing by to prevent the reaction from going awry. Neither the entrepreneur's services (strictly interpreted) nor the price of these services find any place in Walras's "solution of the equations of production." Only when deviations from equilibrium are signalled by differences between selling price and cost of production does Walras's entrepreneur spring into action. Like an arbitrageur, he seizes the occasion to make a *bénéfice* and in so doing quickly chokes off the source of the *bénéfice*. Walras perceived perfectly clearly that in the state of full equilibrium defined by his mathematical model, "we may even go so far as to abstract from entrepreneurs and simply consider the productive services as being, in a certain sense, exchanged directly for one another, instead of being exchanged first against products, and then against productive services" (§ 188). This, indeed, is what his mathematical model comes to. There the entrepreneur is not identified with the capitalist, as Morishima mistakenly supposes; the entrepreneur is simply eliminated.<sup>20</sup>

<sup>19</sup> Cf., Paul H. Cootner (1968), p. 117.

<sup>18</sup> See also Walras (1874 . . .), English translation, p. 526, Translator's Note [6] to Lesson 8; and Oulès, ed. (1950), p. 161, n. (35).

<sup>20</sup> That the entrepreneur has no place in the static distillate is gradually receiving recognition in the literature. See the *American Economic Review*, vol. 58, no. 2 (May 1968), pp. 60–98: especially the testimony of William J. Baumol, p. 64, and Harvey Leibenstein, p. 72. See also Israel M. Kirzner (1973)



In Walras's eyes, theory required that the role of the entrepreneur, *qua* entrepreneur, be narrowly construed (§§ 366 and 369).<sup>21</sup> To be sure, Say was right in describing "entrepreneurs" of the real world as often performing simultaneously the functions of management, investment, and risk-taking (or better, uncertainty-bearing). It was, however, only in so far as the "entrepreneur" is an ultimate private risk-taker, and only in so far as his positive or negative earnings are "bénéfices d'entreprise," which depend, as Walras observed, "upon exceptional and not upon normal circumstances" (§ 366), that these earnings were excluded from Walras's equilibrium equations. Thus in his whole theoretical construct, Walras deliberately abstracted from uncertainty. This explains the absence of the entrepreneur, *qua* entrepreneur, from the Walrasian model in its "normal" operation.

As a practicing consulting actuary for an important insurance company, "La Suisse," Walras probably thought the distinction that F. H. Knight later drew between "measurable risks and unmeasurable uncertainty" (1921, pp. 19–20 and chap. 7) too self-evident to call for explicit definition. The  $\nu_k, \nu_{k'}, \nu_{k''}$  . . . in Walras's equations of capital formation show that he admitted *insurable risks* into his static system (§ 232, penultimate paragraph). Measurable risks are not incompatible with static assumptions when the insurance of these risks relieves the insured,

on payment of a "technologically" determined premium, not only of the burden of bearing them but also of the burden of holding money he would otherwise need to hold against any "casual and stochastic demands" occasioned by these risks. So long as an individual is insured, he incurs no risk at all; he only incurs the expense of a premium, which can be reckoned as a normal item of cost of production. The  $\nu_k, \nu_{k'}, \nu_{k''}$  . . . in Walras's equations, far from symbolizing the presence of uncertainty in Walras's model, turn out to be a device for eliminating any vestige of uncertainty.

Of course, Walras's insurance premiums have an unexpressed time dimension. So do Walras's quantities demanded, quantities offered, quantities produced, and quantities saved and invested, which are all reckoned per unit of time, like the rate of gross or net return on capital and the rate of interest on money loans. While it is perfectly true that time in this sense inheres in Walras's model, that does not prevent the model from being essentially "timeless." It should be noted that the "unit of time" in terms of which the rates are calculated may be of any length as measured by clock or calendar, provided that in the interval considered no "changes in the data of the problem" can take place to affect anyone's state of expectations and give rise to unmeasurable uncertainties.

I trace the difference between Morishima's and my own interpretation of Walras's theory of *tâtonnement* (which I am reserving for detailed treatment elsewhere<sup>22</sup>) to Morishima's persistent disregard of the distinction between barren time and time productive of "changes in the data of the problem." Walras's theory of *tâtonnement* is a theory of the mechanics, not the history, of the emergence and

---

and (1978, p. 31), who attributes the absence of the entrepreneurial role from modern microeconomics to "its decisive absorption of Walrasian influence," without, however, tracing this influence to its source.

<sup>21</sup> In § 366, Walras criticized the English School for failing to distinguish between the role of the capitalist as recipient of "l'intérêt du capital" (the interest yield on invested capital) and the role of the entrepreneur as recipient of "le bénéfice de l'entreprise" (Walras's italics). In § 369, where Walras acknowledged his indebtedness to J. B. Say for drawing this and other distinctions, he found Say nevertheless wanting in a proper perception of their full theoretical implications.

<sup>22</sup> In "Another Look at Léon Walras's Theory of *Tâtonnement*," to appear in a forthcoming issue of the *History of Political Economy*.

maintenance of general equilibrium. To stress the connection between his ideal model and reality, Walras initially undertook to demonstrate how forces at work in the real world must, given perfect competition, generate (or restore) general equilibrium when it does not exist (or is disturbed). Here, however, Walras ran against a snag, which he had not taken into account in the first three editions of the *Eléments*.<sup>23</sup> As *tâtonnement* is described in the earlier editions,<sup>24</sup> if Walras had allowed the adjustment process to take time, the process itself might well have given rise to “changes in the data,” in which case time would not be sterile, and a whole Pandora’s box of theoretically intractable dynamic phenomena would fly open. To elude a snag of this sort, he introduced into the fourth edition his device of “tickets” (“bons,” § 207), by means of which he could eliminate time in the unwanted sense. Whether or not *tâtonnement* by means of tickets must take appreciable time is, as I see it, a moot question; but even if it did, the time taken would, by hypothesis, be sterile and hence the whole mechanical adjustment would be as good as “timeless.” Hence the time profile of *tâtonnement* described on pages 41–45 of Morishima’s *Walras’ Economics* neither corrects nor amends Walras’s theory of *tâtonnement*; it refers to something else, which may be important enough, but which Walras neither had nor wanted to have in his static model.

With the elimination of the entrepreneur, the firm too was *ipso facto* eliminated. In Walras’s theory of production, the adjustment of the supplies of both productive services and products to their respective demands (§§ 200–206) was conceived to take place entirely automatically by means of the market mechanism

(§ 221). No room was left for firms privately to supersede the market in the direction and coordination of productive resources.<sup>25</sup> In Walras’s “equations of production,” which depict a state of equilibrium, we look in vain for the main-spring of the firm’s activities, namely profits in the sense of *bénéfices*. As we have seen, *bénéfices* can arise only in the course of the emergence (*établissement*) of equilibrium via a *tâtonnement* process (§§ 208–20); but once a self-sustaining state of equilibrium has been reached, all *bénéfices* vanish. That a state of equilibrium arrived at in this way implied the absence of uninsurable risk, Walras was perfectly aware; but he does not appear to have perceived that he was ignoring the transaction costs that would be entailed in the absence of firms—unless the services of land, labor, and capital “technologically” required in the operation of the market mechanism were meant to figure among the “coefficients of production” in the calculation of costs (§ 203).

As the following quotation from Morishima shows, he rightly understands Walras’s *bénéfices* (which he calls “excess” or “supernormal profit”) to originate in the *tâtonnement* process, but he then assigns to these *bénéfices* a destination that does not fit Walras’s model at all. According to Morishima, “In Walras’ own model, it is implicitly assumed that the aggregate excess profit (or supernormal profit) which may accrue in a positive or negative amount in the process of establishing an equilibrium is not distributed among individuals, so that the same amount is saved or dissaved by firms” (p. 49). In conformity

<sup>23</sup> See Walras (1874 . . .), p. VIII of the fourth and subsequent editions; p. 37 of the English translation.

<sup>24</sup> Walras (1874 . . .), pp. 582–83 of the English translation: Collation Note [8] to Lesson 20.

<sup>25</sup> Cf., Ronald H. Coase (1937). It should be noted in this connection that Walras assumed away all total fixed costs from his formal theory of production, leaving only total variable costs as alone compatible with his assumption of sustainable perfect (i.e., atomistic) competition. See Walras (1874 . . .), third edition, p. 473, n. 1 (in *Appendice I*) repeated in subsequent editions and on p. 474, n. 1 of the English translation. Cf., G. L. S. Shackle (1977), pp. 25–26.

with this alleged implication and “in order to correct Walras’ model so as to fulfil Walras’ Law,” Morishima enlarges Walras’ model to include “the budget equation of the firms” in which the “aggregate excess profit” appear as their savings. Such an enlargement constitutes a misinterpretation rather than a correction of Walras, whose model admitted of no savings other than those made by utility-maximizing individuals.

It would have been a betrayal of the underlying intent of his general equilibrium model for Walras to admit into any part of it a normal distributive share consisting of *bénéfices* or other income that is not obtained in exchange for the productive services of either land or labor or capital on terms established in a perfectly competitive market. Surely it was Walras’ intent, which he emphasized in a letter to Launhardt in 1885, that compatibility with “justice” be an overriding requirement of his general equilibrium system;<sup>26</sup> and this, given his philosophy of “justice,” would preclude from his system the presence of any income that is not a functional return. The system portrayed by Walras’ mathematical model of general equilibrium is rigorously static, with resources, population, tastes, and technology all invariant.

Just as there was no room in Walras’ general equilibrium equations for the entrepreneur, the firm, profits (in the sense of *bénéfices*), uninsurable risk, and exogenous transaction costs, so, notwithstanding Morishima’s opinion to the contrary, there was no room for growth either. Having mistaken Walras’ theory of capital formation (*théorie de la capitalisation*) for a theory of capital accumulation or, as he calls it, “a real growth theory” (pp. 72–74), Morishima feels that the original version is in need of reformulation to make it

more realistic and thereby provide the entrepreneur with a normal participatory function,<sup>27</sup> which had been denied him in Walras’ formal theory of production. Morishima claims that his reformulation retains “the essentials of Walras’ theory, without any significant revision” and is, consequently “harmless.” Did not Walras himself agree that there was no essential difference between, on the one hand, his formal mathematical model in which it was assumed for theoretical simplicity that capitalists do their saving, not in liquid funds, but in physical capital goods which they hire out in kind on terms arrived at by competitive bidding in the market and, on the other hand, the real world in which entrepreneurs purchase physical capital goods as they see fit with funds borrowed from capitalists who accumulate their savings in money (§ 235)? Morishima is convinced that a model, constructed by use of more advanced analytical techniques than Walras had at his command, in which investment decisions are separated from

<sup>27</sup> The participatory entrepreneur is not the only gratuitous invention in Morishima’s exposition of Walras’ general equilibrium theory. Another is that of the “auctioneer” (p. 19). In fact, there is no “auctioneer” anywhere in the *Eléments*. It is an invention after the fact made in later expositions and extrapolations of the original model. When done with extreme caution, the introduction of a “Walrasian auctioneer” may be harmless enough in an exposition of Walras’ theory of *tâtonnement*, but only if the role of the “auctioneer” is restricted to that of a pre-programmed mechanical device, which does nothing more than raise or lower initially quoted prices until positive or negative excess demands vanish everywhere. In the *Eléments* prices are said to be “cried,” but Walras did not specify by whom they are “cried.” It seems reasonable, therefore, to render Walras’ “*crié*” by “quoted” or “called,” the quoting or calling being done by anyone: the prospective seller, the prospective buyer, or third parties, say brokers or an “auctioneer.” It may well be an “auctioneer,” but as Walras conceived the adjustment process, it is the collective response to price by all the market participants, in other words, by the market acting like a vast computer, that does the adjusting automatically. Cf., Walras (1874), p. 16 of the 1883 version, where Walras himself likened the equilibrating mechanism of the market to that of a *calculateur*, literally a computer, albeit pre-electronic.

<sup>26</sup> Jaffé (1965), vol. 2, pp. 49–51, Letter 652 of which a pertinent excerpt is cited in English translation in Jaffé (1977), p. 380.

saving decisions, entails no substantive misrepresentations of Walras's original conception. Once revised in this way, Walras's model can be brought historically within hailing distance of Keynes's model (p. 82).

When one reads the *Eléments* with "the full story of Walras' economics" in mind, Morishima's attempt to harmonize Walras's theoretical construct with reality can only lead to a distortion of the original general equilibrium model. Walras conceived all economic activities, including capital formation, solely as exchange phenomena,<sup>28</sup> all governed by the same fundamental laws of exchange and all motivated by the pursuit of maximum psychological satisfaction subject to budget and, where relevant, technological constraints. The whole system is everywhere pervaded by Walras's utility theory of exchange, which is not, as Morishima likes to think, a mere "hors d'oeuvre" served only to whet the appetite for such "main dishes: [as] the theory of capital formation and credit and the theory of circulation and money" (p. 70). The constrained utility maximization principle is as vital to Walras's theories of capital and money (Lessons 26, 27, and 29 of the *Eléments*), as to his theories of pure exchange and production. The consistency of the entire system was then so defined by Walras as to render all exchange decisions not only internally compatible one with another, but also externally compatible with his ideal of "commutative justice"—a far cry from the actual world.

To avoid misapprehending the intended significance of Walras's theories of capital and money, it is not sufficient to view these theories as integral parts of the general equilibrium model (p. 4); it is no less important to take careful account of the juncture at which Walras introduced each of these theories in the course of con-

structing the comprehensive model. The construction of the rising edifice proceeded methodically by stages: first the stage of pure exchange theory, then that of production theory, then that of the theory of capital formation and credit, and finally that of monetary theory including circulation. Each stage after the first started from structures (solutions) completed in the previous stage or stages and at no point was allowed to incorporate features of a subsequent stage.

Thus at the third stage labeled "capital formation and credit," as at the two previous stages, all prices were reckoned in *numéraire*, since money was not to be introduced until the fourth stage. To remain in strict conformity with the statical assumption underlying his general equilibrium model, Walras continued to postulate constant technical coefficients of production and, more importantly, invariant stocks of capital goods even at the capital formation stage. The new feature he added to the edifice at the third stage was the theory of the determination of the prices of "capital goods proper," i.e., of capital other than landed and human capital, which either cannot be produced at all or are not wholly produced in consideration of price and cost of production. Only "capital goods proper" (hereafter called simply capital goods) were treated as a potentially variable factor in the equations of capital formation.

The whole purpose of acquiring and maintaining a capital good, which has no utility of its own, is to enjoy the net income it yields. With current techniques of production assumed constant, no allowance need be made for obsolescence. On the other hand, the normal susceptibility of capital goods to wear and tear and to accidental destruction cannot be ignored. To maintain a given stock of capital goods in a state of uninterrupted efficiency, provision for depreciation and insurance, which depends on the durability and ex-

<sup>28</sup> See Walras (1874 . . .), pp. XIV–XV of the fourth and subsequent editions, pp. 43–44 of the English translation.

posure to accident of each capital item, is usually included in the gross price charged for the service of the item. The net price per unit of capital service is thus calculated by deducting from the gross price the share of the depreciation charge and insurance premium imputable to the corresponding unit of service. The price, then, which a buyer is willing to pay for a capital good depends upon the net income it yields and may yield in perpetuity if fully maintained and insured.<sup>29</sup> The ratio of the net income to the price of a capital good constitutes its rate of net income. In view of the inherent relationship between the prices of capital goods and their net incomes, the determination of equilibrium prices of capital goods is contingent on the determination of the equilibrium rate of net income. Hence Walras's conditions of equilibrium in perfectly competitive markets for capital goods included: not only (1) equality between the quantity demanded and the quantity supplied of each and every capital good, and (2) equality between the price per unit of each capital good and its cost of production; but also (3) uniformity in the rate of net income derived from all capital goods of every kind.

This, however, was not all. Walras contended that in an established static economy where all services are readily marketable, there is no incentive to trade in the capital goods themselves and consequently there is no possibility of establish-

ing an equilibrium market price for such goods so long as the economy remains stationary (§§ 234 and 269). It is only when decisions are taken that are destined to result in an increase in the total quantity of capital goods, i.e., only in a progressively orientated economy, that a market for new capital goods can be envisaged to determine their prices in *numéraire*. An economy on the verge of expansion implies that some, if not all, individuals in the economy, besides providing for the maintenance of the capital goods they already have, are considering a sufficient reduction in their current expenditures on consumers' goods to have enough savings left over for a desired acquisition of additional capital goods in order to increase their aggregate net incomes. Consequently, besides the three conditions of equilibrium in capital formation above enumerated, there is the further condition (on a macroeconomic scale) that the value in *numéraire* of aggregate net savings (i.e., the value of the goods and services that would otherwise be directly consumed) be equal to the aggregate value in *numéraire* of the additional new capital goods to be produced.

From stage to stage, Walras's model reveals its austere abstract character ever more starkly. This was undoubtedly deliberate, in line with Hicks's recent remark that "effective theories . . . cannot afford to bother about difficulties which are not

<sup>29</sup> Walras's assumptions underlying the depreciation charges included in his equations of capital formation are far from clear. He wrote textually: ". . . we need only suppose that a sum proportional to the price of a capital good is deducted from its annual income as required either in order to maintain the capital good continuously as it was when new or [alternatively] to replace the capital good when it becomes useless" (§ 232; my translation). Robert Kuenne and apparently Morishima too (p. 75) interpret the second alternative to imply "the building up of reserve balances for future replacement" (Kuenne, 1954, p. 343; cf. Kuenne, 1963, pp. 227-28). True, but only if the above passage is taken out of context. Walras's definition and description of the

depreciation of capital appeared in his theory of capital formation, which preceded his theory of money and therefore could not, at that juncture, refer to "the building up of reserve balances," since money was still out of the picture. In its own context the above quoted passage can only mean that Walras supposed either that the repair and replacement of parts of a capital good take place continuously without interruption of its operation at prime efficiency throughout the year, or alternatively, that a given capital good is such that it completely collapses at one fell stroke on turning out its annual product and is then immediately replaced from an existing actuarially determined stock of capital goods kept at the needed level out of gross proceeds from the sale of the product.

important for the problem at hand" (1976, p. 140). But to judge the effectiveness of a theory it is necessary to identify "the problem at hand," which, in the case of Walras's *Eléments*, was to formulate a static model of "commutative justice" within a system of interdependent market decisions rather than construct a model of the operation of real markets.

As it did not serve Walras's purpose, he deliberately and explicitly left the flow of time out of account (assuming, for example, all production to be instantaneous), and, with time, he quite intentionally dismissed from his model considerations of uncertainty, expectation, changes in technological data, changes in resources, changes in population, and cyclical fluctuations. Since capital formation, once carried out, entails dynamic changes in the data, Walras confined his attention to decisions made at a given moment of time, without following up the consequences of the decisions. In his own words found at the close of § 251 of the *Eléments*: "Thus equilibrium in capital formation will first be established in principle. Then it will be established effectively by the reciprocal exchange between savings to be accumulated and new capital goods to be supplied *within a given period of time*, during which *no change in the data is allowed*. Although the economy is becoming *progressive*, it remains [for the time being] *static* because of the fact that the new capital goods play no part in the economy until later in a period subsequent to the one under consideration" (Walras's italics).

The crux of the matter is revealed in the words, "to be accumulated" (*à amasser*) and "to be supplied" (*à livrer*) in the above passage. These expressions and the definition of the symbols  $D'_k$ ,  $D''_k$ ,  $D'''_k$  . . . Walras used in his "solution of the equations of capital formation" to designate quantities of new capital goods "to be manufactured" (*quantités à fabriquer*)

(§ 252) clearly mark off Walras's theory of capital formation from theories of capital accumulation or growth. It is, therefore, not "harmless" or consistent with "the spirit of Walras" to regard Walras's *théorie de la capitalisation* as a "real growth theory," which is only in need of reformulation to make it work, as Morishima supposes Walras intended (p. 82).<sup>30</sup>

Walras was very much aware of the degree of abstraction from the real world that he allowed himself in his theory of capital formation. This is clear from the following: "In reality, only land and personal faculties are always hired in kind; capital proper is usually hired in the form of money in the market for services. The capitalist accumulates his savings in money and lends this money to the entrepreneur who, at the expiration of the loan, repays the money. This operation is known as *credit*. Hence, the demand for new capital goods comes from entrepreneurs who manufacture products and not from capitalists who create savings. Clearly, from the theoretical point of view it is immaterial to the capitalist and to the entrepreneur whether what the one lends and the other borrows is the capital good itself, new or old, or the price of this capital good in the form of money. It is only from the point of view of practical convenience that the latter arrangement is distinctly preferable to the former" (§ 235).

Actually the capital formation feature of Walras's general equilibrium model was designed entirely in real terms;<sup>31</sup> and

<sup>30</sup> Cf., William D. Montgomery (1971), in which the author's announced purpose was to reinterpret Walras in order to "show that the Walrasian system and contemporary models of economic growth . . . share a family resemblance" (p. 378), which is not the same thing as saying, *à la* Morishima, that the Walrasian system constituted an imperfect growth model.

<sup>31</sup> Money being absent at the third stage, there can be no accumulation or borrowing and lending of money, so that saving, though evaluated in *numéraire*, can only take place in *real terms* and is necessarily identical with investment.

though Part V of the *Eléments* was entitled, "Theory of Capital Formation and Credit," financial credit played a very insubstantial role in the theory—as insubstantial as the grin of the Cheshire Cat. Along with credit, securities (including bonds) and all the documentary paraphernalia of the businessman's "financial market" were explained away for theoretical purposes in a passage in § 255 of the *Eléments*, which ends as follows: ". . . It is clearly seen now that the key to the whole theory of capital is to be found in thus eliminating capital loans *in the form of numéraire* so that attention is directed exclusively to the lending of capital *in kind* [Walras's italics]. The market for *numéraire*-capital, however useful in practice, being nothing but a superfoetation in theory, we shall leave it on one side and return to the market for capital goods in order to find out how the equilibrium price of new capital goods is determined."

In the light of this passage, it is surprising that Morishima (p. 72) and other eminent general equilibrium economists, Don D. Patinkin (1965, p. 554, *n.* 52) and Kuenne (1963, p. 318, *n.* 53), for example, insist on interpreting Walras's pure theory of capital formation as if it included bondholding and contemplated bond acquisition as an alternative to holding and acquiring real assets in the form of durable goods. If, indeed, bonds can be allowed to have any place at all in Walras's theory of capital formation, it is only as paper representing the *numéraire* value of loaned income-yielding physical assets.<sup>32</sup>

<sup>32</sup> The "promissory notes" that Kuenne (1959, pp. 121–23, and 1961, pp. 98–99) regards as virtually contained in Walras's monetary equations could only be there if they fell, implicitly or explicitly, into the category of paper representatives of income-yielding physical assets rather than of the money in terms of which the notes are denominated. Kuenne, however, argues that the presence of  $o_u p_u$  on the income side of Walras's budget equation in § 275 must be construed to imply the presence of "promissory

Morishima himself apparently perceives this at one point (pp. 137–38; *cf.*, p. 152), though just before reaching that point he contradicts this correct impression by telling us that "in Walras' system . . . individuals can [sic] save in the form of physical goods, as well"—i.e., as well as saving in the form of bonds (p. 136, *n.* 2). Walras's own words cited above show that he considered representative securities a supererogatory element (*une superfétation théorique*), which may as well be left aside in any theoretical investigation of the ultimate determinants of the equilibrium prices of capital goods.

Even in § 242 of the *Eléments*, where, in order to round out the rational framework of his "théorie de la capitalisation," Walras introduced a commodity (*E*), which looks for all the world like a consol, he explicitly defined it as a figment of the theorist's imagination ("il nous suffira d'imaginer une marchandise (*E*) consistant en *revenu net perpétuel*. . ."). If this is overlooked, a misreading of the entire theory results. Commodity (*E*) was not meant to be anything other than a pure abstraction serving to reduce the whole complex of heterogeneous capital assets to a homogeneous net-income yielding

notes" for which a separate market is bound to exist in the system. At the same time, when due consideration is given to the fact that in the same § 275 and in Walras's "solution of the equations of circulation and money" (Lesson 30) each and every unit of money held in cash balances is assumed to be earmarked in lieu of a monetary unit's worth of a specified type of circulating or fixed capital, then it is seen that the "promissory notes" that Kuenne reads into Walras's model could hardly be anything else than representatives of non-monetary assets. Only if Walras had allowed money itself to be an autonomous type of circulating or fixed capital independent of other types, would trading in "promissory notes" have the place Kuenne assigns to it in Walras's model as an alternative to trading in real assets. While fully acknowledging the practice of independent trading in commercial paper and securities in the real world, Walras deliberately kept it out of his theoretical model in an effort to probe the deeper reality in economic relationships that, as he saw it, underlies appearances (§ 255).

entity.<sup>33</sup> With a unit of (*E*) virtually defined as a perpetuity yielding the equivalent of one unit of *numéraire* per annum forever,<sup>34</sup> Walras equated the *number*,  $q_e$ , of such imaginary perpetuities which an individual theoretically possesses to the *numéraire* measure of his *total* net income derived annually not only from his "capital goods proper," but from his landed-capital and human capital as well, as in his equation:

$$q_e = q_t p_t + \dots + q_p \pi_p + \dots + q_k \pi_k \\ + q_{k'} \pi_{k'} + q_{k''} \pi_{k''} + \dots,$$

where the right hand side is the sum in *numéraire* of the individual's net incomes derived from his several assets symbolized type by type. The *numéraire* price of a unit of (*E*) being defined as the reciprocal of the rate of net income, the equilibrium rate is such as to equate the *numéraire* value of the aggregate net quantity of perpetual annuity shares demanded in the economy to the *numéraire* value of all net savings, whether in the form of marketable or nonmarketable assets, aggregated over all individuals in the economy.<sup>35</sup> Obviously, it is a mistake to consider Walras's perpetuities as negotiable instruments in the usual realistic sense. In Walras's static model from which all transfer payments are excluded, securities, if they have any place at all, cannot be viewed as anything but a veil.

Money, however, was more than a veil in the Walras general equilibrium model, as is seen in the fourth stage where the overall theoretical edifice was completed.

<sup>33</sup> As Kuenne so well describes it: "By means of these constructions relating to commodity (*E*), Walras was able under stationary conditions to reduce all capital goods to varying amounts of a homogeneous good on the basis of their earning power, since only this last quality is of importance in the consumer's decisions to invest or disinvest in them" (1963, p. 207).

<sup>34</sup> Cf., Walras (1874 . . .), English translation, p. 531: Translator's Note (9) to Lesson 23.

<sup>35</sup> Walras (1874 . . .), English translation, p. 531: Translator's Note (11) to Lesson 23.

Walras's aim in designing his pure theory of circulation and money was to construct a capstone that would fit neatly onto his still unfinished edifice without destroying its essential character. At this culminating stage, he explicitly declared his intention to introduce circulating capital and money "without abandoning the *static* point of view while taking a position as close as possible to the *dynamic* point of view" (§ 272, Walras's italics). This can only mean that he intended to complete the building of his general equilibrium model on unmitigated static principles. No changes that are inherent in the passage of time, none of the uncertainties and unpredictable fluctuations, and none of the speculative expectations growing out of irremediable ignorance of the future are admissible within the bounds of "the static point of view." In that case, what place could Walras possibly find for money considered as furnishing not only a unit of account and a medium of exchange but also a store of value against unforeseeable eventualities. Money without a store of value function to perform would be emasculated and deprived of its *raison d'être*.<sup>36</sup>

Walras, to be sure, understood the difficulty of his undertaking and perceived the need for a device, if one could be found, to overcome it. In the preface to the fourth edition of the *Eléments*, he wrote:

<sup>36</sup> No one need hold money in significant quantity to perform its other functions, since any thing or combination of things having positive value in exchange could serve just as well as *numéraire* and an appropriately devised check-off system could take care of current transactions; but to perform the store-of-value function, money under normal circumstances (as long as its own purchasing power remains fairly stable) serves better than anything else either to cope with unfavorable contingencies or to take full and immediate advantage of favorable contingencies that may arise in the unforeseeable future. For a fuller discussion of the place of money in a stationary economy and for a survey of the literature on the issue, see Kuenne (1963, pp. 291-305); Robert W. Clower and Peter W. Howitt (1978, pp. 453 and 457-64); and Paul Davidson (1977, pp. 542-43 and 560). Cf., Walras (1874 . . .), English translation, p. 542, Translator's Note [2] to Lesson 29.



“We shall see in this fourth edition how the inclusion of ‘the desired cash balance’ [*l’encaisse désirée*] made it possible for me to state and solve the problem [of circulation and money] *within this static framework* [my italics] on exactly the same terms and in precisely the same way as I solved the preceding problems [of exchange, production and capital formation].”<sup>37</sup>

How, exactly, did Walras go about making a place for money in a model characterized by decision-taking under certainty? Indeed, it has been pointed out, for example by J. Hirshleifer, that in a model without uncertainty where “market-clearing prices [are established at no transaction cost and] exist for all commodities. . . , all commodities are equally and perfectly ‘liquid’” (1972, p. 136). Walras’s way out of the difficulty was to assimilate money with “circulating capital,” i.e., capital that is immediately used up or alienated when it is used at all, except in the performance of a technologically indispensable stand-by function. It is in this guise that money appears in his overall system of equations; but his verbal explanation was so sparse that it has still left many an acute analyst puzzled and wondering, “Why money?” To answer this question in terms of Walras’s theory, I propose to flesh out his skeletal exposition while sticking as closely as possible to his fundamental assumption of a sustainable static state from which all uncertainty is absent in the large and in the small.

To that end, I turn to what I have called the technologically indispensable stand-by function of circulating capital. If, in the production process, the inflow of raw materials and intermediate products could be perfectly synchronized with the outflow of final output, there would be no need for a stand-by function of circulating capi-

tal. If, on the other hand, the best technology practicable makes such synchronization impossible, then in order to adjust the rate of output of final products to presumably foreknown market requirements, somewhere along the various pipelines feeding the production process, there must be bins, tanks, refrigerators, etc. holding some of the raw materials and intermediate products that come in more lumpily until trickling ingredients catch up. These technologically determined stand-by stores perform what Walras called a “service d’approvisionnement,” which I have translated as “service of availability”—not against uncertainty, but in conformity with a perfectly known and perfectly predictable production function. Analogously, in the consumption process, for intractable physiological and technological reasons, the flow of products to the consumer’s hands is rarely synchronized with the flow of these products from hand to mouth, so to speak. Hence consumers’ goods, even nondurable consumers’ goods, have to be accommodated in larders, freezers, cupboards, wardrobes, etc. in quantities that the assumed perfectly known and perfectly predictable time pattern of consumption makes necessary. Now since all the circulating capital performing services of availability represents an investment that cannot be undertaken except at an opportunity cost, services of availability are not free goods. Decisions to invest in technologically necessary stores of circulating capital are made in direct and indirect competition with decisions to invest in other sorts of capital, so that at equilibrium, in an ideally perfect market system, the rate of net yield is the same for the above defined necessary stores of circulating capital as for fixed capital. Within the all-comprehensive model, each particular service of availability, measured in one of its dimensions by the time during which it must be used, enters as a technical coefficient

<sup>37</sup> Walras (1874 . . .), p. 42 of the English translation.

in the production function, and its price appears among the items in the cost of production equations. Moreover, at equilibrium the prices of the several services of availability are such as to equate the quantity demanded of each of them to the quantity offered.<sup>38</sup>

What has this to do with money? As it turns out, it has everything to do with money in Walras's scheme of things because there money was taken to be a form of circulating capital, having the same *raison d'être* and governed by the same principles as circulating capital.

To see how this can be so, we need only suppose the economy to be an exclusively spot economy, where everything is paid for, cash-on-delivery.<sup>39</sup> For technological reasons already described above, incoming deliveries to a person or firm cannot always be synchronized with outgoing deliveries by the same person or firm, though the exact dates of these deliveries in each direction are specified and precisely known in advance. How then can everyone always be ready to pay cash-on-delivery even where every prospect is sure? Some, whose receipts antedate expenditures, will have cash balances not immediately required, while others, whose expenditures antedate their receipts, can only fulfill their obligations by borrowing cash balances from those who have a temporary surplus of cash. However that may be, under our assumptions cash balances will always have a role to play in the normal course of even perfectly predictable transactions. They are,

indeed, necessary for the smooth running of the postulated static economy.

Like stores of circulating capital and for the selfsame reasons, stores of cash are required and have to be decided upon. It is to the *ex ante* quantity demanded of cash that Walras gave the name of *l'encaisse désirée*. It is generally overlooked that the adjective *désirée* in this term is no less important than the noun *encaisse* for an understanding of Walras's theory of money. The adjunct *désirée* differentiates Walras's *desired* cash balance theory from cash balance theories pure and simple. It preserved Walras's "timeless" model from dynamic intrusions that would have been alien to his static conception of general equilibrium. It made it possible for Walras fully to integrate the monetary complement of his general equilibrium edifice with the rest. By deriving the demand for cash balances from the same principles that he invoked in deriving the demand for everything else, he avoided dichotomizing his system.

Yet nowhere in Morishima (1977), not even in chapter 9 entitled "General Equilibrium with *encaisse désirée*," have I discerned any hint of the *ex ante* implications lurking in the adjective *désirée*. Where chapter 9 mentions the "high degree of substitutability" implicit in Walras's theory of inventory in money (p. 143), the obvious reason for this inherent property, namely that Walras's theory was confined to the decision stage, escapes notice. Morishima interprets Walras's theory of money as a cash balance theory *tout court*, and not surprisingly finds it "impossible or absurd . . . to reproduce it in its original form" (p. 125). Morishima's corrections and alterations of the theory in chapter 9 render it incontestably superior to Walras's as a realistic cash balance theory; but the reconstruction is not "in the spirit of [Walras's] *encaisse désirée*" as Morishima claims.

<sup>38</sup> Even under the assumption that all technical coefficients are fixed, equilibration can be effected by changes in the product mix as demand shifts from products requiring more (or less) than open "services of availability" to those requiring less (or more) of these services in their fabrication.

<sup>39</sup> Kuenne also perceives that ". . . in Walras' models all delivery dates and quantities are contract certain, and payments for all goods and services are made at the time of delivery" (1963, p. 316).

Walras conceived each unit of the desired cash balance to be earmarked and held in lieu of a monetary unit's worth of the specified item of circulating or fixed capital it was destined to purchase. While held until a prearranged date of delivery of the capital, each unit of the desired cash balance was regarded by Walras as rendering the type of service of availability peculiar to the item of capital to be purchased with it. This enabled Walras both to enlarge his set of utility maximization equations by adding to it the utility functions of the several services of availability of the consumers' goods demanded in the form of suitably earmarked money (§ 274), and to count among the productive services demanded the specific services of availability of money rendered in production (§ 276).<sup>40</sup> From these enlarged sets Walras then derived each individual's gross demand for money-to-be-held in exactly the same way he derived the gross demand for any commodity or productive service in his system.<sup>41</sup> Simple aggregation yields the total gross quantity demanded of cash balances which, when confronted with the total gross supply of cash (a supply that would be exogenously given in the case of fiat money), tells us what price (expressed in a *numéraire* other than

money) is the equilibrium price of the service of availability of money. Once that price has been determined, the equilibrium price in *numéraire* of money itself can be determined on the assumption of an invariant one-to-one relation between a unit of money and a unit of its service of availability.

The definition of monetary equilibrium is especially tricky because it calls *both* for a price of the service of availability of money at which the quantity of money demanded is equal to the quantity offered or supplied *and* for the compatibility of that price with the market-clearing prices of everything else. Furthermore, equilibrium requires that the rate of interest, i.e., the ratio of the price of the service of availability of a store of money to the amount of money stored, be exactly equal to the rate of net return on capital generally (§ 277).<sup>42</sup>

Walras's strict adherence to the statical hypothesis on which the whole general equilibrium edifice rested led him to relegate his discussion of the "Conditions and Consequences of Economic Progress" to Part VII, toward the end of the *Éléments*, where it was tacked on, along with Part VIII, as a *coda* structurally separate from the preceding self-contained pure theory. That Walras meant the preceding Part VI to top off his all-encompassing model of general equilibrium is shown at the very outset of that part by his declaration that he intended his theory of circulation and money "to *complete* the general problem of economic equilibrium [my italics]"—so, at least, I understand his sentence, "Le moment est venu d'introduire ces éléments [the monetary elements] dans le problème général et complet de l'équilibre économique" (§ 272). When he came to the first Lesson of the next Part VII,

<sup>40</sup> Walras might have introduced banking and credit operations into his model without either violating its "spirit" or impairing its structure simply by assuming that the services rendered by these operations are required by the technology of production. In such a revised model these services would find a place as input coefficients along with other technical coefficients; and the costs of credit and banking transactions would be considered on the same footing as other costs, including the cost of holding cash balances, in the cost of production equation. Cf., S. C. Tsiang (1966, p. 331) and Lloyd S. Shapley and Martin Shubick (1977, pp. 942–43).

<sup>41</sup> I define "gross demand" as the quantity of a good or service traders desire to possess at a given price of the good or service, in contradistinction to "net demand" designating the quantity of the good or service traders want to acquire, at a given price, in addition to what they happen already to possess of it.

<sup>42</sup> See Walras (1874 . . .), English translation: pp. 545–46, Translator's Notes [15] and [16] to Lesson 29.

Walras pointed out in the following passage how fundamentally the "continuous market" he was now introducing departed from his previous model: "Finally, in order to draw closer and closer to reality, we must go so far as to replace our hypothesis of a periodic annual market by that of a continuous market; in other words, we must pass from the static to the dynamic state. . . . [The continuous market] is perpetually tending toward equilibrium without ever actually attaining it because the market has no other way of approaching equilibrium than by groping [*par tâtonnement*] and before the goal is reached, it has to start groping afresh, all the basic data of the problem, such as the initial quantities possessed, the utilities of goods and services, the technical coefficients, the excess of income over consumption, the working capital requirements, etc., having changed in the meantime" (§ 322; my revised translation).<sup>43</sup> Yet Morishima deplores the failure of expositors of Walras's general equilibrium model to incorporate Part VII of the *Eléments* into their account of the model (p. 5). Why should they have done so, since Walras himself furnished a very good reason for not doing it, viz., the abandonment of the static hypothesis it would entail?

Walras did not insist on keeping his general equilibrium theory static and stringently abstract out of indifference to the real world, just to construct a pretty axiomatic model for the fun of it.<sup>44</sup> On the

<sup>43</sup> In the dynamic context of Part VII, unlike the static context within which he had analyzed the mechanism of *tâtonnement* (§§ 127–30) as a process analogous to the Gauss-Seidel procedure for solving simultaneous equation systems, Walras now alluded, without analysis, to a very different market adjustment process, which is bound realistically to take time entailing "changes in the data."

<sup>44</sup> It may be noted, in passing, that if Walras's general equilibrium theory was couched in terms of mathematical equalities instead of inequalities such as we find them in modern reformulations of the theory, it was, as Morishima has very well shown (pp. 13–14), not because Walras was unaware of inequalities yielding corner solutions (Walras [1874

contrary, as the *obiter dicta* in his other writings and in the *Eléments* (especially in Part I) attest, he was ardently interested in improving the real world. To cope with his problems, Walras indulged in a brinkmanship that might well have excited the envy of John Foster Dulles. Up to Part VII of the fourth and subsequent editions of the *Eléments*, Walras's formal analysis brought him to the very brink of economic dynamics where, without ever overstepping the brink, he stood tiptoe to report, in digressions that Morishima takes for a "literary model," what he glimpsed beyond. The changes in the structure and organization of the *Eléments* from the first to the last edition<sup>45</sup> bear witness to a long and difficult struggle to achieve formal unification of his comprehensive system, while still keeping his vestigial nontheoretical interests before him and yet within proper bounds. The "purification" of his theory was progressive over the years, but never complete, so that his definitive version reads like a palimpsest with earlier inscriptions imperfectly rubbed out.

Whatever Morishima may say, Parts VII and VIII of the *Eléments* were not meant to be considered an integral part of Walras's general equilibrium edifice. The *coda* was meant rather to serve as a link between his pure static theory and his applied and "social" theories, which are intrinsically dynamic. It was to show, as it

. . .] §§ 80 and 89 of fourth and subsequent editions), but it was rather, as I see it, because the admission of inequality solutions would be incompatible with the rest of the model from which profits and losses, i.e., positive and negative receipts not representing a *quid pro quo* in conformity with "justice," were excluded as a matter of principle.

<sup>45</sup> See, for example, Walras (1874 . . .), English translation: pp. 573–74, Collation Note [h] to Lesson 11; pp. 574–75, Collation Note [a] to Lesson 12; p. 581, Collation Note [a] to Lesson 17; p. 586, Collation Note [a] to Part V; p. 587, Collation Note [h] to Lesson 23; p. 589, Collation Note [a] to Lesson 24; pp. 590–93, Collation Note [a] to Lesson 25; pp. 595–96, Collation Note [a] to Lesson 26; pp. 600–602, Collation Note [a] to Part VI; and p. 605, Collation Note [a] to Lesson 35.

were in anticipation of the later charges of sterility of his general equilibrium model, how the relations analyzed in the static theory could be used to elucidate such dynamic tendencies as the rise in land-rent and the fall in the rate of profit in an expanding economy (§§ 332–34). That is what makes it so irresistibly tempting to extrapolate Walras's model and to imagine that the original model itself contained dynamic analyses. The formal model, however, remained strictly a model of mutually compatible decisions without any exploration in depth of the consequences of these decisions once carried out.

It is because our contemporary critics of Walras, our Patinkins, our Kuennes, our Garegnanis, our Morishimas, proceed blissfully unmindful of Walras's primary aim in creating his general equilibrium model that I suspect they misunderstand it and subject it to reformulations, emendations, and corrections that are beside the point—I mean, of course, the point the historian of economics is obliged by his craft to make.

## REFERENCES

- ALLIX, E. "La rivalité entre la propriété foncière et la fortune mobilière sous la Révolution," *Revue d'histoire économique et sociale*, 1913, 6, pp. 297–348.
- BAUMOL, WILLIAM J. "Entrepreneurship in Economic Theory," *Amer. Econ. Rev.*, May 1968, 58(2), pp. 64–71.
- BOSON, MARCEL. *Léon Walras, Fondateur de la Politique Économique Scientifique*. Paris: Librairie générale de droit et de jurisprudence, 1951.
- BOUSQUET, G.-H. "L'autobiographie inédite de Léon Walras," *Rev. Economique*, March 1964, 15(2), pp. 295–304.
- CLOWER, ROBERT W. AND HOWITT, PETER W. "The Transactions Theory of the Demand for Money: A Reconsideration," *J. Polit. Econ.*, June 1978, 86(3), pp. 449–66.
- COASE, RONALD H. "The Nature of the Firm," *Economica*, N.S., Nov. 1937, 4, pp. 386–405; reprinted in *Readings in price theory*, Homewood, Ill.: Irwin for the American Economic Association, 1952, pp. 331–51.
- COOTNER, PAUL H. "Spéculation, Hedging and Arbitrage," in *International Encyclopedia of the Social Sciences*. Vol. 15. Edited by DAVID S. SILLS. New York: Macmillan, Free Press, 1968, pp. 117–21.
- COURNOT, A. A. *Revue sommaire des doctrines économiques*. Paris: Hachette, 1877; reprinted, New York: Kelley, 1968.
- DAVIDSON, PAUL. "Money and General Equilibrium," *Écon. Appl.*, 1977, 30(4), pp. 541–63.
- DE ROSA, G., ed. *Vilfredo Pareto, Lettere a Maffeo Pantaleoni*. 3 vols. Rome: Banca Nazionale del Lavoro, 1960.
- DUVILLIER, A. *Hommes et idéologies de 1840*. Paris: Rivière, 1956.
- HICKS, J. R. "Léon Walras," *Econometrica*, Oct. 1934, 2, pp. 338–48.
- . "Some Questions of Time in Economics," in *Evolution, welfare and time in economics: Essays in honor of Nicholas Georgescu-Roegen*. Edited by ANTHONY M. TANG, FRED M. WESTFIELD, AND JAMES S. WORLEY. Lexington, Mass.: Heath, Lexington Books, 1976, pp. 135–51.
- HIRSHLEIFER, JACK. "Liquidity, Uncertainty, and the Accumulation of Information," in *Uncertainty and expectations in economics: Essays in honour of G. L. S. Shackle*. Edited by C. F. CARTER AND J. L. FORD. Oxford: Blackwell, 1972, pp. 136–47.
- JAFFÉ, WILLIAM, ed. *Correspondence of Léon Walras and related papers*. 3 vols. Amsterdam: North-Holland for Royal Netherlands Academy of Sciences and Letters, 1965.
- . "Léon Walras: An Economic Adviser *manqué*," *Econ. J.*, Dec. 1975, 85(340), pp. 810–23.
- . "The Normative Bias of the Walrasian Model: Walras versus Gossen," *Quart. J. Econ.*, August 1977, 91(364), pp. 371–87.
- . "Review of Michio Morishima's *Walras' Economics: A Pure Theory of Capital and Money*," *Econ. J.*, Sept. 1978, 88(351), pp. 574–76.
- KIRZNER, ISRAEL M. *Competition and entrepreneurship*. Chicago: Chicago University Press, 1973.
- . "The Entrepreneurial Role in Menger's System," *Atlantic Econ. J.*, Sept. 1978, 6(3), pp. 31–45.
- KNIGHT, FRANK H. *Risk, uncertainty and profit*. Boston: Houghton Mifflin, 1921; reprinted by the London School of Economics and Political Science, No. 16 in Series of Reprints of Scarce Tracts in Economic and Political Science, 1933.
- KUENNE, ROBERT E. "Walras, Leontief, and the Interdependence of Economic Activities," *Quart. J. Econ.*, August 1954, 68(272), pp. 323–54.
- . "Patinkin on Neo-classical Monetary Theory: A Critique in Walrasian Specifics," *Southern Econ. J.*, Oct. 1959, 26, pp. 119–24.
- . "The Walrasian Theory of Money: An Inter-

- pretation and a Reconstruction," *Metroeconomica*, August 1961, 13, pp. 94-105.
- . *The theory of general economic equilibrium*. Princeton: Princeton University Press, 1963.
- LEIBENSTEIN, HARVEY. "Entrepreneurship and Development," *Amer. Econ. Rev.*, May 1968, 58(2), pp. 72-83.
- MARSHALL, ALFRED. *Principles of economics*. Eighth edition. London: Macmillan, 1920.
- MONTGOMERY, WILLIAM D. "An Interpretation of Walras' Theory of Capital as a Model of Economic Growth," *Hist. Polit. Econ.*, Fall 1971, 3(2), pp. 278-97.
- MORISHIMA, MICHIO. *The economic theory of modern society*. Translated by D. W. ANTHONY. Cambridge and New York: Cambridge University Press, 1976.
- . *Walras' economics: A pure theory of capital and money*. Cambridge and New York: Cambridge University Press, 1977.
- OULÈS, F., ed. *L'École de Lausanne: Textes Choisis de L. Walras et V. Pareto*. Paris: Dalloz, 1950.
- PARETO, VILFREDO. *The mind and society, A treatise on general sociology*. 4 vols. Edited by ARTHUR LIVINGSTON. Translation of *Trattato di sociologia generale* (1916), by ANDREW BONGIORNO AND ARTHUR LIVINGSTON. New York: Harcourt, Brace, 1935.
- PATINKIN, DON. *Money, interest and prices*. Second edition. New York: Harper & Row, 1965.
- "Paul." See below, WALRAS, L. ["Paul," pseud.] (1878).
- SCHUMPETER, JOSEPH A. "Marie Ésprit Léon Walras 1834-1910," *Z. Volkswirtschaft, Sozialpolitik, Verwaltung*, 1910, 19, pp. 397-402; republished in English translation in *Ten great economists from Marx to Keynes*. By JOSEPH A. SCHUMPETER. New York: Oxford University Press, 1951, pp. 74-79.
- . *History of economic analysis*. New York: Oxford University Press, 1954.
- SENSINI, GUIDO, ed. *Correspondenza di Vilfredo Pareto*. Padua: Cedam, 1948.
- SHACKLE, G. L. S. "New Tracks for Economic Theory 1926-1939," in *Modern economic thought*. Edited by SIDNEY WEINTRAUB. Philadelphia: University of Pennsylvania Press, 1977, pp. 23-37.
- SHAPLEY, LLOYD S. AND SHUBIK, MARTIN. "Trade Using One Commodity as a Means of Payment," *J. Polit. Econ.*, Oct. 1977, 85(5), pp. 937-68.
- STIGLER, GEORGE J. "Textual Exegesis as a Scientific Problem," *Economica*, N.S., Nov. 1965, 32(128), pp. 447-50.
- TSIANG, S. C. "Walras' Law, Say's Law and Liquidity Preference in General Equilibrium Analysis," *Inter. Econ. Rev.*, Sept. 1966, 7, pp. 329-45.
- WALRAS, LÉON. *L'économie politique et la justice*. Paris: Librairie de Guillaumin, 1860.
- . "Principe d'une théorie mathématique de l'échange." *Séances et travaux de l'Académie des Sciences morales et politiques*, vol. 101 of the Collection, 33rd Year of New Series, Part I (Jan. 1874), pp. 97-116; republished with minor revisions in *Théorie mathématique de la richesse sociale*, Lausanne: Corbaz, 1883, pp. 7-25.
- . *Éléments d'économie politique pure*. First edition (in two installments). Lausanne: Corbaz, 1874-77; Second edition, Lausanne: Rouge, 1889; Third edition, Lausanne: Rouge, 1896; Fourth edition, Lausanne: Rouge, 1900; Definitive edition (published posthumously), Lausanne: Rouge, 1926; reprinted, Paris: Pichon and Durand-Auzias, 1952; English translation, *Elements of pure economics*, translated from the definitive edition by WILLIAM JAFFÉ, London: Allen & Unwin; Homewood, Ill.: Irwin, 1954. (Reprint of Economics Classics, New York: Kelley, 1969.)
- . ["Paul," pseud.] "Chroniques de la quinzaine," *Gazette de Lausanne*, Jan. 18, 1878-May 18, 1878.
- . *Études d'économie sociale (Théorie de la répartition de la richesse sociale)*. Lausanne: Rouge, 1896; Second edition, edited by G. LEDUC, Lausanne: Rouge; Paris: Pichon and Durand-Auzias, 1936.
- . *Études d'économie politique appliquée (Théorie de la production de la richesse sociale)*. Lausanne: Rouge; Paris: Pichon, 1898; Second edition, edited by G. LEDUC, Lausanne: Rouge, Pichon, 1936.
- . "Ruchonnet et le socialisme scientifique," *Revue socialiste*, July 1909, 50(295), pp. 577-89.

*Appendix*

Je suis un idéaliste. Je crois que les idées transforment le monde à leurs images et que l'idéal entrevu par un homme pour son siècle s'impose à l'humanité. Je crois que le monde a mis dix-huit siècles à tâcher de réaliser—sans y réussir—l'idéal de Jésus et des premiers apôtres. Je crois que le monde mettra dix-huit ou vingt autres siècles peut-être à essayer sans y mieux réussir de réaliser l'idéal entrevu par les hommes de 89—aperçu plus clairement par nous—éclairé par nos successeurs. Heureux de penser que moi-même j'aurai peut-être répandu la moindre lumière sur ce tableau.—En cela je suis directement au rebours de mon siècle. La vogue est aux faits, à l'observation des faits, à la constatation des faits, à l'érection des faits en lois. Par un jour de tempête la direction politique est tombée aux mains des masses ignorantes. L'art, la science, la philosophie ont été submergées. Nous avons été écrasés par le nombre. Les faits sont les maîtres, l'empirisme couronné règne et gouverne. Nos hommes de l'analyse examinent [l'explosion], attendant que le chaos se répande de proche en proche, pour le décrire avec amour et le glorifier avec quiétude. Quant à moi, je m'y refuse. Que mon idéal soit borné, c'est possible. Il l'est moins toutefois que ne pourrait le faire croire la traduction imparfaite que ma bouche en donne. Quel qu'il soit, je m'y réfugie—c'est mon asyle contre l'envahissement des faits brutaux et si mon siècle m'écrase comme l'univers le roseau de Pascal, il ne m'aura du moins pas fait vivre de sa vie. J'aurai vécu dans le passé et dans l'avenir. [Léon Walras.]