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The Collected Economic Works of William Thomas Thornton: An Introduction and Justification

Why Put Together a Collected Economic Works of William Thomas Thornton?

Upon proposing this project to a number of our friends and acquaintances, the most frequent reaction we encountered was: William *Who?* This is hardly a propitious start for a program to increase historical sophistication and an appreciation of the traditions which conspired to bequeath us modern economics. Whereas other scholars have given us wonderful editions of the complete works of Adam Smith, David Ricardo, Karl Marx, and John Maynard Keynes, which have immeasurably enhanced our appreciation of their endeavors and contexts, it would not ever impinge upon the consciousness of most economists to consider William Thomas Thornton (1813–80) for commensurate treatment. Since the present author is not much of an antiquarian, nor does he harbor an especially fond fixation upon the more obscure corners of Victorian British history, nor does he especially wish to tilt at windmills, it is clearly incumbent upon him to explain why you, the reader, should take this project seriously, and perhaps even become acquainted with Thornton's ideas.

Among specialists in the history of Victorian social and economic thought, Thornton is widely regarded as little more than a bit player, perhaps like Rosencrantz or Guildenstern in *Hamlet*. The comparison is more apt than they might at first concede. In the play, Rosencrantz and Guildenstern are reputed to be close friends of Hamlet, but they are summoned by Hamlet's nemesis in an effort to penetrate his odd behavior and cryptic utterances. They are subsequently treated rather rudely by both sides in the larger dramatic conflict, to such an extent that they are often confused and conflated with one another.[1] Hamlet then stage-manages a play within the play, which Rosencrantz and Guildenstern protest is not a credible performance. Hamlet treats them with stiff cordiality when he is in their presence, but conspires to send them to their deaths at the hands of the English, unwittingly bearing their own death sentence as a message from the prince, a demise which (in the opinion of many critics) is even more senseless and tragic than the trademark Shakespearean bloodbath at the conclusion of the play. In the end, the huge chess game of duplicity and feints is all for naught, since all the jockeying for political advantage in Denmark merely clears the way for the ruthless invader Fortinbras to assume the throne and bring down the curtain on a century or more of royal rule. Only in the last century did we come to realize that interpretation of the play need not dwell so insistently upon the vicissitudes of Hamlet himself, and that some more subtle bathos inheres in the experience of Rosencrantz and Guildenstern as pawns in a larger game for which they never enlisted and could never adequately comprehend (Stoppard 1967).

Lest we be accused of speaking in riddles in the manner of Hamlet, let us describe Thornton's fate in more prosaic terms. William Thornton is treated in the orthodox history of economic thought literature, if at all, as the person who created the occasion for John Stuart Mill's celebrated "recantation of the wages-fund doctrine," a doctrinal revision of near eschatological significance for his contemporaries which we shall treat in some detail below. This crisis in English classical political economy, it is often said, was triggered by the publication of the first edition of Thornton's book *On Labour* (1869). What is notable about modern accounts of this incident is the cavalier disdain assumed by all toward Thornton and his role. In our experience, almost no modern commentator (with one or two honorable exceptions to be noted below) has deemed that Thornton's ideas merited serious scrutiny, then or now. Because of this conviction, they expend no effort to explicate his writings in any sympathetic detail, instead concentrating all their hermeneutic powers upon such revered figures as John Stuart Mill or Alfred Marshall. To offset the impression that we generalize about this contempt hastily and unwarrantedly, let us sample some of the calumny which has been heaped upon Thornton's head.

George Stigler sniffed that Thornton's *On Labour* was "absurd" (1965, 9). Krishna Bharadwaj opined that his arguments "were rather confusing and weak" (1978b, 260). William Breit accused Thornton of "fatuous" examples and "flimsy criticism" (1967, 519, 521). Lujo Brentano once wrote, "Mr. Thornton's chapter "On the Origins of Trades Unions" bears the same relation to the real origin of Trades-Unions as Rousseau's *Contrat Social* to the historical origins of States" (1870, clxv). The economist Robert Ekelund finds himself unable to repress his roiling scorn, launching into a barrage of *ad hominem* accusations: "Thornton's purpose appears not to be a scientific search for truth, but rather to find an argument that will support his preconceived political conclusions"; he "was inappropriately applying the method of the natural sciences to the social sciences"; "there is no textual evidence that Thornton ever understood Mill's simple but serviceable theory"; and his book could not be considered "anything more than an unsophisticated stab in the dark" (Ekelund and Thommesen 1989). Evelyn Forget, in a somewhat more cautious mood, asserts with confidence that Thornton's "contribution does not reach the same level of analytical sophistication as does Mill's or Longe's" and that his "economic analysis did not transcend the level of popular debate of the era" (1991, 207, 215). From this litany of disdain–and we have by no means exhausted its breadth–one would infer that Thornton would not deserve even the attention it would take to do a serious job of refutation.

Yet here we encounter one of the first of a sequence of paradoxes which seem to hover about the historical personage of William Thomas Thornton. If he really was such an intellectual lightweight, a literary leper, a sad specimen of someone who couldn't think his way out of his own inkwell, then why was it that so many of the acknowledged giants of nineteenth-century political economy took him so very seriously? It is indeed wondrous to see how the modern paragons of scientific logic and sober orthodoxy squirm in the presence of contemporaneous testimonials to his intellectual acuity and conceptual consequence–that is, if they even deign to acknowledge their existence. For instance, John Stuart Mill, in promoting the intellectual merits of *On Labour*, wrote, "The present work, though popular and attractive in style, is strictly scientific in its principles and reasonings" ([1869] 1967, 633). J. E. Cairnes acknowledged Thornton's impetus to his own work: "the one living writer [for] whose abilities and acquirements I feel high respect, and [with] whose practical aims I not unfrequently sympathize ... I trust I have profited by the example he has set me of courtesy towards opponents" (1874, 1–2). The *Economist* opined, "This is a book all true economists should welcome." An anonymous reviewer in the *Examiner* of 4 November 1871 called Thornton's book so "revolutionary in its effects that it rendered obsolete all existing economical works." An essayist in *Westminster Review* of July 1869 wrote, "Admirable as the work is in itself, embodying the results of a lifetime of disinterested study, and full of new lights on obscure questions of economical science, it has done the most service perhaps by calling imperatively upon every man of note to revise and test his opinions upon this momentous subject. ... for though there is a good deal in his scientific reasoning to which exception maybe taken... we cannot fail to recognise in his work the result of independent thought, high moral aim, and a generous intrepidity in a noble cause" (37). The *British Quarterly Review* enthused, "His style is at once popular and precise; so perfectiy clear and sparkling that his readers can follow him with ease through subtle and complicated discussions ... Mr. Thornton makes us realize that the conclusions of the economist both need the perpetual verification of experience, and, in fact, receive it; while he questions anew those formulas which, by reason of their very excellence as abbreviations of an enormous multitude of particular facts, are liable to lose their meaning when, like algebraic symbols, they are applied to long and complicated problems" (1869, 448). A less starry-eyed reviewer in the *Athanaeum* was still prompted to admit, "He is given to digression, and uses everywhere from twice to ten times as many words as are needed to set forth his meaning; nevertheless, it may, on the whole, be doubted whether any considerable economic work of equal merit has appeared since the first publication of Mr. Mill's Political Economy" (1869, 275). There were other Victorian contemporaries who attained more exalted academic positions than Thornton–one thinks of Henry Fawcett at Cambridge, John Elliot Cairnes at University College, or Bonamy Price at Oxford–who in their cautious orthodoxy and placid commonplaces never achieved a vanishing fraction of the attention and (more importantly) scrutiny which was lavished upon Thornton. Of course, not all commentators would equally attest to his analytical perspicaciousness or resort to unchecked praise; but the enervated levels of rhetoric, pro and con, did suggest that something rather more significant had occurred than the inept frothings of a developmentally challenged intellect.

But that is only the most obvious paradox. To repress or disparage the judgment of those long dead is one thing; but to condemn the living is quite another. If Thornton really was the inconsequential character that so many make him out to have been, then he must enjoy the dubious distinction of being the single most discussed minor character in the modern archives of the history of economics. A survey of just the primary English-language journals dealing in history of economic thought reveals more than ten articles concerned with Thornton over the decade of the 1990s. The incongruous spectacle of repeated attempts by diverse scholars to either explain away his writings or simply thrust him unceremoniously back into his grave (one fears endless reruns of *Night of the Living Economists)* itself calls into question whether he is indubitably irrelevant. Recently, the growing secondary literature on Thornton has provoked the redoubtable Robert Ekelund to an academic frenzy, prompting him to call Thornton an "idiot" who "should receive a grade of "F" (with strongly worded advice to return to the pursuit of poetry and sociology)," to insist that his "(in)famous arguments were worse than nonsense," and to extend his disparagement to modern writers who study Thornton (1997; Ekelund and Thornton 2001). Lecturing skulls in graveyards, especially those belonging to persons supposedly deemed Fools when alive, is not calculated to foster confidence in the Royal House of economic orthodoxy. Perhaps something really is rotten in the state of Trademark.

This brings us back full circle to our perceived need for a readily accessible *Collected Works* of William Thomas Thornton. It seems that his writings, but especially his book *On Labour*, touched a pervasive chord for many writers in that crucial period of the 1860s and 1870s in Britain: that is, right when British classical political economy began to be superseded by what has become known in retrospect as "neoclassical" economic theory. Indeed, we shall argue that Thornton's book played a major role in the actual configuration of events which led up to the initial statements of the fledgling doctrine by such figures as Fleeming Jenkin, William Stanley Jevons, Francis Ysidro Edgeworth, and Alfred Marshall. The importance of the controversy swirling about Thornton in the 1860s and 1870s has still not been adequately appreciated by historians, at least in part because of the inaccessibility of his works and the lack of a convenient summary of reactions by his contemporaries. Thornton the gadfly was in a large measure responsible for the condensation of the specifically British form of microeconomics prevalent around the end of the nineteenth century. This British version of price theory remains the foundation of "introductory economics" in countless university courses down to the present.

Second, Thornton was also relevant because of his influence upon the rise of political trade unionism in Britain and its changing relationship to academic political economy, something which has gone relatively unnoticed in the literature of the social history of the labor movement. Again, we attribute much of this neglect to the lack of a convenient compendium of his writings. There was a period when much of social history was concerned with searching for the influence (or more pertinently, explaining the lack of influence) of Marxist doctrines upon working-class politics in Britain. A newer generation of scholars has initiated an inquiry into the relevance of middle-class reformist movements in the normalization of union activity (Finn 1993); and it is our opinion that Thornton should be considered one of the major intellectual resources for those movements in Britain in the critical period of the legal legitimation of union activity.

Third, there is the question of Thornton's relevance to modern understandings of economic theory. It is our view that recent controversies over his significance may derive some salience from larger-scale transformations within our *fin de siécle* theoretical orthodoxy of neoclassical economics. In effect, new questions opened up by the modern projects of game theory, experimental economics, computational economics, and evolutionary processes foster a situation in which Thornton can be read in a new, perhaps more user-friendly light. Historians of economics of an earlier generation were generally partisans of a Marshallian mode of price theory–a thesis we shall elaborate upon below–and this implied a jaundiced view of Thornton. One of the most important events of the last forty years has been a progressive repudiation and sloughing off of the Marshallian approach by neoclassical high theory, especially as a result of demonstrations that market supply and demand functions *cannot* generally be derived from more rigorous specifications of neoclassical general equilibrium models.[2] Dramatic transformations in the modern understanding of the so-called law of supply and demand within the orthodoxy of economics cannot but prompt revaluations of the nineteenth-century traditions which attempted to wed such laws to the neoclassical organon of optimizing utility subject to constraints (see chapter 14). Here is where a reconsideration of Thornton's significance for modern economics becomes relevant. Thornton famously insisted that there were no such things as "laws of supply and demand," even though invocation of such laws had become conventional wisdom in the British classical tradition of his era; yet far from preaching paralysis, he insisted that one could still make fruitful theoretical statements about the operation of the economy in their absence. In this opinion he was rebutted most vigorously by various economic theorists, most effectively Alfred Marshall, who forged an alliance between utilitarianism and a revised conception of the laws. Now that Marshall's hundred years of solicitude have been torn asunder (however much some Marshallian holdouts may persist in denying it), it is interesting to trace the filiation back to where the choice was made, and explore the first few steps on the road not taken. Hence, Thornton assumes a new relevance for a generation searching for precursors who might be read as sharing its own concerns.

Fourth, we offer these texts and our interpretation of them as a small contribution to a larger dispute over the future of the history of economic thought. Since the end of the Second World War, the economics profession has precipitously withdrawn its support for scholarship in the history of economics (Weintraub 2002). The motivations have been many and complex, but one reaction of those remaining scholars engaged in the enterprise has been to become more narrowly focused, specializing in perhaps one or two "great men" and subjecting the same canonical texts to repeated microscopic readings, as though that extra modicum of bunkered attention might finally arrive at the "correct" interpretation, the one which vindicates the prejudices of the modern profession, to stand unchallenged for all time. I think there has been no surer prescription for utter irrelevance and oblivion. To phrase my objection in a language we hope these historians can understand, we believe this sort of history has entered a region of sharply diminishing returns. One possible antidote would be to widen the context, expand the roster of players, augment the body of archival evidence, and appeal to traditions of scholarship which have been ostracized by the anti-historical biases of the economics profession. One particularly apposite example of these alternatives applies to an incident central to the career of William Thomas Thornton, namely John Stuart Mill's so-called recantation of the wages fund doctrine. This incident has been a big favorite of the "close reading" camp of historians for years, since it constitutes a major challenge to their project of presenting the last two centuries of economics as a single, homogeneous narrative of continuous progress. Perhaps the most extreme exponent of this practice, Samuel Hollander, is therefore forced to admit that Mill's "retraction of support from the wages fund doctrine constitutes one of the most difficult problems in the history of economics" (1985, 409). Yet no amount of compiling quotes from Mill's published texts on the part of Hollander, nor anyone else, has served to illuminate this incident in a satisfactory manner. We shall instead assert that only when we shift our perspective to adopt Thornton's point of view, and then entertain the notion that much of our own heritage of understanding is a function of what the immediate contemporaries made of Thornton, can much of the intractable and problematic character of the incident be dissolved.

A fifth reason for revisiting Thornton is to establish his place in the conversation concerning the British role in India, and indeed in the economics of colonial rule in the era of high imperialism (Zastoupil 1994). Although we do not attempt to discuss this facet of his work in this chapter, for many historians it may loom at least as large as the other considerations above.

For all these reasons, we have undertaken to present in a convenient format the *Collected Economic Works* of William Thomas Thornton.

A Brief History of the "Law" of Supply and Demand from Year Zero to Cournot

There is a surfeit of writing in the history of economics which seeks to discover the Marshallian laws of demand and supply in numerous texts all the way back to Aristotle, if not before. While the topic of what happens to price and quantity in various market situations was a subject of interested commentary as far back as the beginnings of recorded history, it makes a mockery of the history to simultaneously assert that there is some Platonic economic essence of "supply and demand" which remained intact through the millennia;[3] and worse, that Alfred Marshall did little more than provide a textbook codification of what everyone already implicitly knew. This genre of writing, which Richard Rorty has dubbed "doxography," exists primarily to smother curiosity and stifle any sophisticated appreciation of how we arrived at our present predicaments; it certainly makes it all but impossible to understand the role of William Thornton in the history of British classical political economy.

The indispensable prerequisite for comprehending the very idea that there could exist such a thing as a "law" or "laws" of supply and demand is to acknowledge that the phrase did not refer to any single concept or phenomenon over time: rather, it was repeatedly recast in conjunction with some rather critical variables over the course of the history of economic thought. The conditioning variables to which we shall make passing reference are: transformations in the economic history of diverse market structures; relationships to notions of "science" and scientific explanation; the strength of conviction in the unity of human social experience and the fundamental identity of human cognitive structures; the role of geometry and mathematics in British science and economic expression; and the pivotal importance of theories of value, and especially the critical difference between "classical" or substance theories of value (Mirowski 1989b) and neoclassical or "field" theories of value. In brief, notions of supply and demand were continuously adjusted to conform to some matrix of these variables, and this process continues down to the present day. One simply cannot comprehend Adam Smith, Antoine Cournot, William Thornton, Fleeming Jenkin, William Stanley Jevons, Alfred Marshall, Henry Schultz, or Werner Hildenbrand without taking each of these factors into account; this has been one of the glaring weaknesses of previous historical narratives from Joseph Schumpeter to Mark Blaug to John Creedy.

Joseph Schumpeter once asserted that the laws of supply and demand "proved unbelievably hard to discover" (1954, 602). Perhaps the reason why the trek was so arduous was not any failing on the part of those who ventured down that trail ; rather, it was a necessary consequence of Schumpeter's project to squeeze something so promiscuous and profoundly variable onto the Procrustean bed of a single brace of "laws" grounding the totality of economic analysis. Because the famous Marshallian scissors still serve as the golden arches over the entranceway into orthodox economics, the geometrical Checkpoint Charlie of Economics 101, it may seem almost perverse to insist that these ideas are neither obvious nor well-defined in such a way that they could readily be extended back to the dawn of economic analysis. Perverse or not, it remains the truth, a truth intimately bound up with William Thornton's role in the history of economics.

The Constitution of Subsistence Markets

We shall embark upon our narrative in the late seventeenth century, since this is the context most relevant to the history of British conceptions of supply and demand, and latterly to the writings of Thornton. The single most significant fact to notice about economic writers in this era is that they did not uniformly presume all markets to be fundamentally alike, either in form or in function; certain markets identified by the specific commodity and geographic provenance were felt to obey alternative principles of legitimate operation, and thus to require alternative explanations. Land markets were heavily informed by kinship procedures and distinctions, which in practice could lend appreciable flexibility to land measurement (chapter 7); household items would be negotiated ad hoc with itinerant peddlers; in some instances, labor obligations partook of a customary character. In the same sense in which numerical measurements were not globally invariant nor cosmopolitan, neither were markets. The market for bread in urban centers was always acknowledged as operating according to distinct sets of principles. The very notion of an impersonal and standardized market was a relatively circumscribed phenomenon, and for good reasons: outside a few metropoles, units of measurement and legal relations were anthropomorphic and narrowly local, most people had great difficulty with even simple forms of calculation, and consequently sellers were as likely to alter the character or physical constitution of the commodity offered as to adjust the money price in the face of altered circumstances of what we would now call scarcity. Standardization, monetary and metrological, was plainly a function of the spread of political hegemony; few contemporaries would have associated it with the spread of a generic "market" or disembodied "division of labor." Because most trade was ineluctably local and personalized, the most common mental model of exchange was one of "fair trade," which is why the earliest attempts to portray a generic market function are derived from moral and political philosophy. The European fascination with the "just price" had appreciable justification in the actual configuration of lived economic experience.

To indulge briefly in bald generalization, the dynamism of the Western polities in the seventeenth century had profound consequences for these patchy, disconnected, and fundamentally heterogeneous markets, and for the patterns of thought which underwrote their operations. Without getting into the controversy over whether notions of natural science induced ambitions of market standardization or vice versa (Hadden 1994), clearly models of fair trading were giving way to something altogether more general and mechanistic at the end of the century. Fairs and itinerant peddlers went into decline, and were being replaced by all manner of other forms of structured retail activities, especially in large and burgeoning cities. Standardization of weights and measures became a rallying cry for reformers, who used the state to impose it from above; merchants increased their reliance on the judiciary to settle disputes about the terms of trade and discharge of obligations; the maintenance of double-entry accounts became the *sine qua non* of the prosperous merchant, and even the proto-industrialist. The model of idiosyncratic, personalized fair trade was being displaced by another model, one with higher turnover, greater interaction with strangers, layered abstractions for the gauging of success, and limited manipulation of the constitution of the goods sold. The spread of standardization and price-regulated markets proceeded hand in glove, although this change did not resemble the "spontaneous order" so beloved of those who would rather recount fairy tales about virtual origins than study actual history. In order to render the market more impersonal and mechanical, it was thought necessary to relegate it to a limned and well-policed space, so that supervision could insure that an increased dependence upon price-regulated adjustment did not backfire and undermine the state which had set it in motion in the first place.

The shift from "fair" to "price-regulated" trade did not proceed along a uniform front, either geographically or across commodities. Neither was the substitution without friction; much of the literature of the "moral economy" of spontaneous revolts documents the clash of the two (Thompson 1993, 200–207). Although a synoptic history of this "great transformation" is still notable primarily by its absence, one cannot read the contemporary literature discussing markets without noting that a fair proportion of writers felt that the market for bread warranted special care and attention because of its distinctive features, and that British attitudes and analysis diverged sharply from those prevalent across the Channel in France. Initially, both England and France engaged in elaborate intervention and regulation of the production and sale of bread, regarded as "subsistence," particularly in urban settings; the fear was that intermittent crises of subsistence could not be adequately contained by a price-regulating market structure, and therefore required vigilance and overt control. However, by the eighteenth century England and France had diverged in their approach to the problem of bread markets. In England, the Assize of Bread was allowed to lapse; forestalling, regrating, and engrossing were essentially decriminalized (Webb and Webb 1904; Barnes 1930). In 1795 England suffered the worst grain shortage of the entire century, and yet there was no renewal of targeted market controls. If there was any attempt to offset crises of subsistence, it took the form of policies like Speenhamland: rather than stipulate the correct operation of the market, relief was scaled to the local price of bread. In effect, the British did not subject the operation of the bread market to close scrutiny, trusting Nature and their convenient insularity to effect most of the required alterations in the machinery of trade. This would have subtle consequences among the British for their subsequent conceptual picture of commerce.

The situation in France was altogether different. Grain police and micro-management of grain market operations were a hallowed tradition, only to be redoubled in the eighteenth century (Kaplan 1976; 1984). The French also had their champions of trust in Nature: the Physiocrats made it one of their crusades to revoke this doctrine of supervision of grain sales. In 1763 their followers managed to lift most market controls, but the result was political and economic disaster, and the system of close market scrutiny was reimposed in 1770. Upon the accession of Louis XVI, A. R. J. Turgot was appointed controller general of finances, and he immediately ordered the grain police abolished once again. Serious dearth beset France in 1775, and yet in the teeth of hunger Turgot tried to force through further market liberalizations, only to be sacked for his efforts in 1776. The sequence of dearths of subsistence is still widely credited as one of the triggers of the French Revolution. Beyond the political consequences, this plague turned out to be the defining moment in the development of French political economy. Every attempt to come to grips with price theory in France, from Turgot to Galiani to Lavoisier to Canard to Say, was in one way or another a struggle to come to terms with the distressing sequence of failures to understand how the bread market worked. Every evocation of the "naturalness" of the commerce found itself compelled to confront this particular market, and to explain the utter disarray of the grain police in their efforts to render markets fair and transparent.

Modern commentators often attribute the failure of the grain police to the hubris of the Enlightenment project of rational planning; they pass over in silence the failures of the attendant market liberalizations. These superficial reactions ignore one of the more important common denominators of the Physiocrats and the grain police: both had more or less the same understanding of how grain markets worked. Both would cite an array of forces under the dual rubrics of demand and supply to organize their causal accounts of price movements; the difference was that the grain police believed they were not countermanding or suppressing these forces, but instead rendering them more transparent and aboveboard, so that justice and equity would be better served. This was the motivation behind such strictures as a restriction of all commerce to a public marketplace, prohibitions on resale, forced offer of inventory within three market days (or risk seizure and sale by grain police), and explicit public encouragement of higgling and bargaining. In practice, the grain police were seeking to render demand and supply visible and accessible to all, so that there would be no hint of corruption or exploitation in its justice and operation. By *imposing* a specific means of clearing the market and *defining* demand and supply in terms of palpable quantities and clearly posted prices, it was the French regulatory tradition which first made it possible to even conceive of a market as a Natural configuration which equilibrated a relatively decontextualized set of price-quantity relationships focused upon the activities of buying and selling. It is because of this development that the tradition of treating demand and supply as *functions* was first nurtured in France, and found its initial expression in French political economy.

The Impact of Enlightenment Natural Philosophy

Since most histories of the sciences tend to restrict themselves to a single line of inquiry or distinct subset of subject matter, it has been difficult in the past to recognize the essential commonalities across disciplines of the movement of ideas and technologies in specific historical eras and geographic contexts. Of late, this situation has been remedied to some extent, with historians of the natural sciences paying more attention to the social sciences, and some historians of the social sciences achieving greater acquaintance with the literatures of the natural sciences. There are two signal themes from this interdisciplinary endeavor which bear direct relevance for the history of price theory. The first, which we cannot adequately summarize here, identifies the seventeenth- and eighteenth-century predilection for explaining trade as motion, and the explanation of motion in turn as the transmission and exchange of a unified "substance" which inheres in all massy bodies (Mirowski 1989b, chapter 2). The upshot of this structure of explanation is that it was "second nature" to depict market trade as being controlled by some embodied substance inherent in all commodities, be it *blé* for the Physiocrats or embodied labor in the British context.

The second theme has recently been adumbrated by Norton Wise (1993). He argues that much of Enlightenment thought was unified by the idea and the technology of the "balance," ranging from the calorimeter to the treatment of *vis viva*, from the products of fermentation to the manipulation of probabilities, and from animal health to the balance sheet. Although the centrality of the icon of balance was pervasive in European thought, the French were the acknowledged virtuosi of the balancing act. Vis viva was balanced in mechanics; caloric was balanced in the calorimeter; débit and credit were counterbalanced in the balance sheet. Nevertheless, there existed a noticeable equivocation on the correct application of the balance in various scientific contexts. On the one hand, "balance" might denote deterministic harmonic fluctuations about a predefined equilibrium position, themselves attributed to external perturbations of a second order of significance; here, classical mechanics provided the model. In this case the laws governing the equilibrium and the perturbations were essentially identical. On the other hand, “balance” might connote a canceling out of numerous accidental disturbances to a system, where the aggregate of disturbances would be presumed to have no special bias in any particular direction; the exemplar here was testimony in legal settings. In this version, the disturbances might originate from causes having nothing to do with the laws governing the central tendency. This ability to shift back and forth in explanatory resources when explicating balance would have direct implications in elaborating the concepts of supply and demand.

There is a collateral theme from the history of science which also deserves a glance. It is a commonplace in the history of mathematics that by the eighteenth century, styles of mathematical expression had diverged in pronounced ways between England and France. The British tended to hew to their Newtonian heritage, preferring geometric arguments and the rather awkward notation of fluxions, whereas the French tended to favor algebra and the Leibniz notation. Of course one could be translated into the other, but persistent biases in matters of perceived rigor and elegance of expression tended to have real consequences in terms of the areas of mathematics which exemplified these standards and thus were deemed to warrant concerted attention. The British would stress the timeless quality of Euclid’s *Elements*, the French Descartes’s analytical geometry and Lagrange’s celestial mechanics. The British fondness for geometric curves and the French penchant for functions would extend even to the presentation of data in scientific reports, although few outside the history of science have come to appreciate just how rare it actually was until well into the nineteenth century to present observations as points plotted on graphs or freehand curves (Tiling 1975).

The Debut of the Discourse of Supply and Demand

William Thweatt (1983) has performed the invaluable service of compiling an inventory of the uses in English of terminology of supply and demand in early classical political economy, and has come up with a number of unexpected findings. It seems in the seventeenth century “supply” was rarely used as a noun, and never in conjunction with “demand.” Prices were instead situated in a context of scarcity and plenty, or “quantity in proportion to vent.” It is only in the early eighteenth century that one finds prices being related to “quantity in proportion to Demand,” notably in the work of an author steeped in French discourse, namely John Law. This language of proportionality echoes early discussions of rational mechanics in English, and points toward incipient metaphors of balance. The political economist who deserves the laurels for the introduction of the terminology of “supply and demand” is the underappreciated Sir James Steuart in 1767;[4] however, the personage who most often garners the credit for promulgating the discourse of demand and supply is Adam Smith in his *The Wealth of Nations*. Since it is Smith rather than Steuart who is the touchstone for much which follows, we will briefly examine his usage of the terms.

Whatever else Smith may have intended, he was by no stretch of the imagination an advocate of the later Marshallian organon of supply and demand. Smith discusses his theory of price in book 1, chapter 7, of *The Wealth of Nations*, in which he distinguishes the phenomena of “natural price” and “market price.” Natural price, determined by natural cost considerations, was of course the primary analytical concept and in the literature of the history of economic thought is often referred to as Smith’s “adding-up” theory. Market price denoted observable, day-to-day price quotations, which were said to be determined by “supply and demand.” There is no question that Smith believed that market price was superimposed upon yet subordinate to natural price, although his discussion of both their determinants and interactions left much to be desired. Market price was said to be propelled by the *ratio* of supply to demand: a common enough locution before Smith, but also one which would readily conjure Newtonian affiliations for Smith’s audience. The quarantine of market from natural determinants was achieved through the use of the natural science metaphor of “gravitation": market price would “gravitate” toward natural price over time. However, this recourse embroiled Smith in the trademark Enlightenment equivocation over whether market price was the playing out of law-governed harmonic motions or instead the canceling out of externally acausal accidents described above. This equivocation itself is responsible for a fair number of the non-Marshallian features of Smith’s discussion: no notion of price-quantity schedules, no law of one price outside of natural price, no dictum that the market must be cleared. A major consideration for Smith’s characterization of market versus natural price is the ability to reserve participation in the market, a theme which will assume ever greater significance in our narrative: “The market price will sink more or less below the natural price ... according as it happens to be more or less important to them to get immediately rid of the commodity" ([1776] 1976, 65).

The French predicament is also a significant subtext of Smith's discussion of price. He praises the Physiocrats in book 4, chapter 9, thanks to whom "the agriculture of France has been delivered of several of the oppressions which it before labored under" (199). At the very least, this statement was premature when it was written, given the history recounted above. Book 4, chapter 5, is scathingly dismissive of those who believe that the bread market requires state intervention: "famine has never arisen from any other cause but the violence of government attempting, by improper means, to remedy the inconveniences of a dearth" (33); "popular fear of engrossing and forestalling may be compared to the popular terrors and suspicions of witchcraft" (41). It was far and away easier to compose such statements in the 1770s, comfortably ensconced in Edinburgh, than to be precariously perched in Paris; but there was also the differential willingness to ignore all the various details of the specific market operation, since they were all deemed the outcome of an inexorable Natural process.

Most aspects of Smith's brief foray into demand and supply would have been recognized as standard operating procedure in Enlightenment discourse. Natural price was to be regarded as an expression of enduring substance–and many pounced upon Smith's brief comments on the labor content of commodities–whereas market price (and therefore supply and demand) could be relegated to the realm of the temporary balance. For instance, Lavoisier could write in 1786: "One may compare the increase in price that accompanies the [grain] shortage to the fevers of illness; the fevers are nothing other than the effort that nature makes to re-establish in the animal oeconomy the order that has been troubled" (in Wise 1993, 220). Yet there remained differences of emphasis and concern, and when the French read Smith, they were not entirely convinced. Perhaps he was thought a little too cavalier about the operation of supply and demand; perhaps he did not quite grasp what the French meant by balance; perhaps the section on labor costs was unseemly; perhaps Smith displayed a tin ear when it came to an understanding of (early) modern science. At a minimum, the French would feel with acute displeasure the deficit of system in his presentation. This deficit would be a complaint of even his major French supporters, Germain Gamier and Jean-Baptiste Say. The differences started small, but gained force and gravitas over time. These differences matter, because the concept of supply and demand was more the province of the French economic community than the British, at least until the advent of late British classical political economy.

France at the turn of the century was replete with Enlightenment balancing acts. Nicolas-Francois Canard's prize essay in 1801 marked the birth of mathematical political economy in France, and stood as the only work of political economy that Cournot read before setting out to compose his own *Recherches*. Canard, an engineer, initiated the French practice of fully and unapologetically disengaging market price from natural price, and in explicit analogy with the balance beam, wrote down an equation of forces which determined price under nonspecific circumstances. Here the sellers and buyers were accorded a single function each, with price as the shared variable; psychological need is identified as the ultimate source of each function; equilibrium is equated with the balance of those forces. Unfortunately, all specification of the sequence of actions by which equilibrium is brought about is absent, in a clear analogy with d'Alembert's principle in mechanics.

Jean-Baptiste Say attracted much more attention and commentary than Canard, and although he was opposed to mathematical expression of political economy, he resembles Canard more than he diverges from him. Say objects to the idea of natural price in Smith, collapsing all lawlike regularities to market price determined solely by supply and demand. "Demand and supply are opposite extremes of the beam, whence depend the scales of dearness and cheapness; the price is the point of equilibrium, where the momentum of one ceases, and that of the other begins... the rise of price is in direct ratio of the demand, and inverse ratio to the supply" (1830, 232). Say's lack of facility with mathematics did not prevent him from attempting to mold his doctrine into a geometrical format in his *Cours complet d'economie politique practique*. The only diagram in the entire work is a triangle, which was intended to represent the number of "fortunes" which (who?) were able to purchase the given commodity at a price represented on the vertical axis (1852, 358; Forget 1994). The relationship to "balance" was more visual than analytical–the figure resembled nothing so much as a fulcrum–and although it made little sense, even with the help of Say's commentary, it did capture the French ambition to develop a theory of supply and demand in critical dialogue with Smith's text which would unify all of political economy and help it to ascend to scientific status through explication of the natural operation of market pricing. Government intervention is denounced in no uncertain terms, and the bread market was cited as one of the relevant examples (362).

Antoine-Augustin Cournot is a landmark figure in our narrative, and not just because he was the one author identified by Marshall as the source of his own inspiration in price theory. Since a geometric portrayal of supply and demand curves can be found in Cournot's *Recherches* (1838), his work is often used to suggest a long and continuous history for the mathematical theory of demand and supply; but such inferences are premature and critically flawed. There exists one very perceptive study of Cournot's oeuvre in French (Menard 1976), but because it languishes untranslated into English, appreciation of Cournot's career has been stunted in the Anglophone world. While Cournot is a recognizable member of the sequence of economic authors in the French engineering tradition (Etner 1987), it is necessary to understand why he was largely ignored in his own country, and why it was that his stock began to rise only at the end of the century in Britain, long after his demise.

Cournot, unlike Canard and Say, possessed a very strong background in mathematics and physics by the standards of his contemporaries; he also demonstrated a deep concern for the pedagogical relationship of geometry to algebra, something which paved the way for later appreciation in the British context. However, he was largely innocent of any previous literature of political economy, which permitted him to venture some rather unorthodox opinions once he came to write his *Recherches;* it was these opinions which rendered him virtually invisible to his Francophone economist contemporaries. The paramount fact of his career, and the source of embarrassment to all who wish to elevate him to precursor status, is that this text met with resounding failure in its intended audience, so much so that Cournot himself repudiated his earlier economic doctrines later in his life (de Ville and Menard 1989). He had failed by the very criteria for which he had hoped to proselytize: his early ideas were deemed poor applied mathematics, and an inadequate codification of Reason.

Cournot begins his 1838 text by considering what about exchange could and could not be considered amenable to mathematical treatment; it is significant that he explicitly identifies that favored concept of Francophone political economy, *utilité*, as falling into the unsuitable category. After a glance at the problem of money, Cournot than confronts the trademark distinction between natural and market prices: "Here, as in astronomy, it is necessary to recognize *secular* variations, which are independent of *periodic* variations" ([1838] 1971, 28). Like his predecessors, Cournot opts to restrict the analysis entirely to short-run or "periodic" phenomena, without any further justification. But that should not be confused with observable prices, as we learn in his chapter 4, "De la loi de débit."[5] Cournot tells us that he intends his curve to correspond to realized sales–and not, we must insist, virtual unfulfilled desires. He then invokes "the single axiom . . . that each one seeks to derive the greatest possible value from his goods or his labor" (44). This axiom is pivotal, since it justifies recourse to the calculus for Cournot.

At this point we are introduced to the central analytical device of the book: "Let us admit therefore that the sales or annual demand D is, for each article, a particular function F(p) of the price p of such article. To know the form of this function would be to know what we call the *loi de débit"* (47). It will now be necessary to quote *in extenso:*

> Since so many moral causes capable neither of enumeration nor measurement affect the law of sales, it is plain we should no more expect this law to be expressible by an algebraic formula than the law of mortality... Observation must therefore be depended on for furnishing the means for drawing up, between proper limits, a table of the corresponding values of D and p; after which, by familiar interpolation of graphical techniques, an empirical formula or curve can be given to represent the function; and solutions can be extended into numerical applications. But even if this objective were unattainable (on account of the difficulty of obtaining observations of sufficient number and accuracy, and also because of progressive variations which the law must undergo in a country not yet at the stationary state), it would nevertheless not be improper to introduce the unknown law of demand into analytical schemes, by means of an undetermined symbol . . . Thus without knowing the law of the decrease of capillary forces, and starting from the principle that these forces are insensible at sensible distances, mathematicians have demonstrated the general laws of the phenomenon of capillarity, and these laws have been confirmed by observation. (47–48)

The nonspecific reference is to Laplace's work of 1805–7 on capillary action (Grattan-Guinness 1990, 442–49); Cournot's mentor Poisson had also been involved in elaborations of the theory. Thus it was all the more damning that Cournot suppressed the comparison after raising it, since Laplace had physical (and not just mathematical) reasons for positing the undetermined capillary function in his theory, and these underwrote the application of various integrals and other mathematical devices. Further, when subjected to experiment, the results were mixed, and this caused Laplace himself to doubt the legitimacy of his analysis. Those cognoscenti familiar with the case would tend to doubt its relevance; and everyone else would simply be passively dazzled by the references to the physical sciences.

It is very difficult to imagine that Cournot himself was unaware of the disanalogies with his economic model. Hard upon the above quote, Cournot posited that his F(p) function was continuous; this was justified by the assumption of a large number of consumers in a thick market (50). Since continuity was a requirement for every mathematical manipulation that followed, Cournot uncharacteristically devoted it much consideration, acknowledging that there might be "exceptions," but conjuring them away with the comment that "just as friction wears down roughnesses and softens outlines, so the wear of commerce tends to suppress these exceptional cases" (51). To pile ignomy on top of unreliability, he then posits that "the price of an article may vary notably in the course of a year, and strictly speaking, the law of sales may also vary in the same interval, if the country experiences a movement of progress or decadence," and therefore "the curve which represents the function F must itself be an average of all the curves which would represent this function" (52). In the midst of this litany of excuses, the all-important negative slope of the function F is inserted as an unmotivated assumption. Time frames, assertions of continuity and regularity, statistical means and individual instances, realizations versus virtual realities, renunciations of mental causes with appeals to human nature, all become hopelessly jumbled in the headlong rush to concoct a function, *any function*, which might be manipulated in the manner of physics: that is, subjected to an optimization procedure. Is it any wonder that Cournot ends this section with the disturbing concession, "We may admit that it is impossible to determine the function F(p) for each article" (53), all the while proposing that economic agents are going to use this function in order to inform their own behavior?

In their unseemly rush to award laurels, modern economists overlook that Cournot's was legitimately deemed a sorry performance, a sad set of *non sequiturs* understandably shunned by Cournot's contemporaries. It is a travesty of history to suggest that Cournot "discovered" anything other than the forever resplendent rhetorical power of physical analogy, let alone the "law of demand." The incongruous imposition of "already completed" price arbitrage on a putative variable state of the thickness of the market and strength of competition is difficult to swallow. The law of one price was only plausible in the case of monopoly, which explains why Cournot's next chapter begins with that topic; and the analysis works solely in terms of the single curve. Since the curve purportedly depended upon "the kind of utility of the article, on the nature of services it can render or the enjoyments it can procure, on the habits and customs of the people, on the average wealth, and on the scale which wealth is distributed" (47), and none of these held out the promise of any stability or invariance, it would have been wishful thinking to regard the function F(p) as anything other than a will-o-the-wisp, much less as continuous with first and second derivatives.

We do not mean to suggest that the majority of Cournot's peers thrust the volume away in disgust over the dubious character of its formal arguments (although Joseph Bertrand's review of 1883 could be cited as one instance). Indeed, it is more likely that they were put off by the text's politics, that is, if they managed to reach the last chapter. There Cournot explicitly set his work in opposition to "the school of Adam Smith," which "with a view to removing the barriers between nation and nation, has always argued from the uncontestable increase in wealth, which has been the invariable result of the removal of barriers" to international trade (160). Cournot's argument was that the extension of the sway of markets could either raise or lower incomes relative to the pre-trade status quo. This alone would have been sufficient to alienate the author from the orthodoxy of French political economy.

No historian other than Claude Menard has paid any attention to Cournot's career after the *Recherches*, which extended for another four decades and numerous books, including two more on political economy. Somehow it is deemed legitimate to ignore the later books because they had no impact on contemporaries; but by those standards, neither should we take a second look at the *Recherches*. The young Cournot relied heavily upon a belief in the inexorable spread of the market and of rationality (with the metric system as its embodiment) to rationalize his own project of a mathematical political economy. He thought that as markets grew thicker and more competitive, and people increasingly rational, it would become legitimate to rely upon the law of large numbers to treat participants as homogeneous, markets as frictionless, and hence F(p) as continuous and well behaved. Menard explicitly links this belief to a common engineering mentality prevalent in that era. However, later in life Cournot grew disenchanted with trends he thought he had observed–the relative failure of the spread of the metric system, lack of progress toward greater competition, and scant evidence of rationality among the masses. These observations provoked a growing philosophical conviction that economics should strive to look more like biology than rational mechanics. For just these reasons, Cournot's later works on political economy contain no mathematical content, and thus no law of sales. It was on just these grounds that Cournot rejected Walras's *Elements* (Walras 1965, letter 294).

British Treatments of Supply and Demand in the Nineteenth Century before Thornton

The discourse of laws of supply and demand was noticeably slower to catch on in Britain than in France. Indeed, as Thweatt (1983, 289) demonstrates, after Steuart and Smith there were no substantial discussions for a quarter-century. The silence was broken by Thomas Malthus's pamphlet *The High Price of Provisions* in 1800 and Henry Thornton–no relation to William Thomas–and James Mill in 1802. But soon thereafter, the number of texts escalates rapidly, with numerous mentions of "supply and demand" in Parliamentary debates by 1810. The primary camp which appears to have adopted the terminology as its own was the "Philosophical Radicals," who included Francis Homer, Henry Brougham, and Richard Torrens (Halevy 1972). It is safe to say that by the end of the Napoleonic Wars the laws of supply and demand were common currency in the British context; but there are many curious and counterintuitive aspects of this sea change which have yet to attract major scrutiny.

The first incongruous aspect of the rise of supply and demand theory in Britain is that this discourse gains purchase right in the period of the genesis and development of the Ricardian orthodoxy in British classical political economy. David Ricardo's hostility to supply and demand as generic explanations of price and quantity in his *Principles* of 1817 and elsewhere are well known, and need not be reiterated here. Thus it is all the more noteworthy that many of the proponents of supply and demand theories were engaged in close contact with Ricardo and grappled with his notions of a scientific political economy during their genesis, all the more reason why classical political economy should never be treated as a monolithic doctrine. Second, it is also well known that the primary context for these debates was disputes over the corn laws and the "high price of provisions." Hence, just as in France (although later in time), it was the vexed question of special treatment to be accorded to the bread or grain markets which called forth the conceptual clarification of notions of supply and demand. Third, this similarity in the conditions of genesis is no mere coincidence, since it was precisely those figures most heavily influenced by French writers and French ideas, especially Malthus, Horner, and Mill Sr. (Halevy 1972, 270), who promoted the primacy of supply and demand in the construction of a scientific political economy. Nevertheless, once the doctrine recrossed the Channel, it tended to assume a different tenor and tone; and this specific historical manifestation requires description in some depth in order to begin to grasp the impact of Thornton's work in the later 1860s. We shall sketch the outlines of such a description by briefly relating the conceptions of supply and demand proposed by a number of key texts in the period, from Thomas Robert Malthus to John Stuart Mill.

From a historiographic distance, Thomas Malthus's *The High Price of Provisions* would resemble a rather standard broadside against those who would seek to regulate bread markets, such as one would find in that era in France. Britain had just suffered a terrible dearth of grain in 1795, and even though harvests had subsequently recovered, prices were still high by historical standards. Malthus's pen was mobilized by his observation that "Many men of sense have joined in the universal cry of the common people, that there must be roguery somewhere; and the general indignation has fallen upon the monopolizers, forestallers and regraters" (1986, 6). The problem for Malthus was that a sophisticated understanding of the laws of political economy was absent: "When any commodity is scarce, its natural price is necessarily forgotten, and its actual price is regulated by the excess of demand over supply." In times of crisis people needed an understanding of the short-term workings of markets; appeals to long-run natural determinants were essentially unavailing. Parson Malthus could not restrain himself from also blaming the Poor Laws and Speenhamland; but the paramount message was that the operation of the market, here explicitly equated with the balance of demand and supply, was not at fault. One observes that even in the British context, the advantages of downgrading the importance of the theory of "natural" price relative to some lawlike supply and demand doctrines were becoming apparent to a few key figures.

It is now frequently forgotten that Jeremy Bentham entered this fray on the opposing side in his *Defence of a Maximum* (1801), supporting temporary price controls on corn. Such heresy, especially among the clique of Radicals, cried out for a response; and James Mill responded to the call in 1804 in his essay on the trade in corn. His major weapon against market intervention was the assertion that "the demand will always be proportioned to the supply, however great that supply may be" (1966, 56). In 1805 Mill was the first to acknowledge J.-B. Say and his "loi de débouches" as a theoretical and political ally. In 1806 Mill wrote an elaborate review of Sir James Steuart's *Principles*–the first systematic treatise to extensively use the language of supply and demand–as a pretext to discuss the corn trade. Mill subsequently developed a close personal relationship with Say, serving as his intermediary with the British luminaries of political economy and facilitating correspondence with Bentham, Malthus, and Ricardo, among others. By 1820 their personal and intellectual careers were so intertwined that Mill Sr. arranged for his adolescent son John Stuart Mill to reside with Say during his first visit to Paris (Bain 1882, 190; Anna Mill 1960). Thus it was not unexpected that when Mill Sr. produced his own *Elements of Political Economy* in 1821, asking in chapter 3 "What Determines the Quantity in Which Commodities Exchange for One Another?" the answer should have been "the principle of supply and demand, in the first instance" (1966, 255). With Mill, the doctrine of price determined by supply and demand and the doctrine that a general glut was impossible became yoked together, so that mere assertion of "laws" of demand and supply were taken as shorthand for a belief that markets always operated, problem free, for the benefit of the common weal.

Hence, by the 1820s, at least in the hands of the "Millians" (as they were then called), "supply and demand" became a sort of litmus test to divine the soundness of someone's position on political economy. The assertion that grain markets always correctly represented the state of scarcity reigning in any given situation shaded over into a dogma that markets would never allow the existence of overproduction in general (although disproportionalities between industries might make for temporary disruption), and therefore all unemployment was merely a matter of frictions, temporary imbalances, or external interference with the wage mechanism. This was a defining moment in British classical political economy: French concern over the specific problems of a grain market with its own characteristic rules and practices, provoking a French liberal backlash against attempts to regulate and regularize subsistence markets, slowly transmuted into a British belief that all markets exhibited the same generic mechanisms described by "laws" of supply and demand, and therefore constituted the primary explanation of why free markets for labor could not result in pervasive unemployment or impoverishment of the workforce.

Consequently, by the 1820s the language of supply and demand was coming to be deployed as a shorthand in England for a very specific political position (Groenewegen 1973, 509): in Parliamentary debates, for instance, it signaled opposition to subsistence aid to the poor or any organized interference in the wage labor nexus. The transformation was swift: in little more than two decades, supply and demand went from a tentative hypothesis to a proposition so well established that one violated it only under the most dire of circumstances. One observes it used unselfconsciously in speeches from the floor, like that of the marquis of Landsdowne in 1822: "That it is mischievous to interfere with the regular course of supply and demand in the market was a principle no less generally recognized; but, so singular was the situation of Ireland, that this great principle of political economy must be violated" (in Fetter 1980, 59). This was the orthodox use of supply and demand which Charles Dickens savaged in 1854 in his novel *Hard Times:* "For the first time in her life Louisa had come into one of the dwellings of the Coketown hands ... She knew them in crowds passing to and from their nests, like ants or beetles. But she knew from her reading infinitely more of the ways of the toiling insects than of these toiling men and women. Something to be worked so much and paid so much, and there ended; something to be infallibly settled by the laws of supply and demand; something that blundered into those laws and floundered into difficulty; something that was a littie pinched when wheat was dear and overate themselves when wheat was cheap; . . . something that occasionally rose like the sea, and did some harm and waste (chiefly to itself), and fell again; this she knew the Coketown hands to be" ([1854] 1961, 160).

However, the stronger were the links forged between the British discourse of demand and supply and this construction of the political lessons of political economy, the less precise were the specifications of what the imperious "laws" actually implied or ruled out. "Laws" they might very well be, but it was noticeable that British political economists expended appreciably less effort than their French counterparts in shoring up their expression with mathematics or empirical data. Perhaps this oversight might be attributed to the uneasy coexistence of the discourse of demand and supply with the stated tenets of the dominant Ricardian school; perhaps the relative quarantine of British political economists from trained engineers and natural sciences (in contrast to the situation of the French) could also have played a role. In any event, the configuration of forces did have the result of producing a much less coherent and sustained discussion of demand and supply in Britain from roughly 1820 to 1870, a period punctuated by periodic unresolved controversies over the meaning and significance of demand and supply.

Especially in the 1820s and 1830s, one cannot but notice a proliferation of positions vis-à-vis the theory of supply and demand. As de Quincey once noted, "that one desperate enormity of vicious logic which takes place in the ordinary application to price of the relation between supply and demand has secured more arguments dispersed through speeches, books, journals than a long life could fully expose" (1897, 118). In the interests of brevity, we shall identify three major categories.[6] First, there were the hard-core Ricardians who sought to defend the central doctrinal primacy of the labor theory of value; this group would include J. R. McCulloch, popularizers such as Jane Marcet, Ricardo himself, and later Thomas de Quincey. Natural price as a cost of production was deemed by them the preeminent theoretical device; the accidental and imponderable aspects of the day-to-day operation of markets were to be disposed of under the rubric of supply and demand. This group, understandably, bore the least stake, and thus exerted the least effort, in trying to stabilize the precise theoretical referent of the terminology of supply and demand. "You must, however, recollect that it is the cost of production of a commodity which constitutes its exchangeable value; the proportion of supply and demand should be considered as only accidentally affecting it" (Marcet [1816] 1827, 417). "Variations of demand and supply occasion corresponding variations of price; but it is essential to remark that these valuations are temporary only. The cost of production is the grand regulator of price–the centre of all those transitory and evanescent oscillations on the one side and the other... wherever industry is unrestricted and competition allowed to operate, the average price of the various products of art and industry coincides with the cost of production" (McCulloch 1864 [1825], 252, 257). "It is a metaphysical impossibility that Supply and Demand, the relation of which is briefly expressed by the term "market value," could ever affect price except by a *secondary* force" (de Quincey 1897, 121).

Then there was a second camp seeking to occupy something like a middle ground: unwilling to wholly repudiate the labor theory in its guise as a "cost of production" approach, but seeking to downgrade it to something resembling a special case of the more general laws of supply and demand. The best representatives of this group were Malthus and his sympathizers such as Longfield and Scrope; but the tent was sufficiently large to encompass the rather more venturesome Mills, the antipodean William Hearn, and Ricardian sometime fellow travelers like Torrens. This was the group that frequently sought to engage Say on his own ground, often flirting to a greater or lesser extent with "utility" as an ur-principle of value, and less frequently looking to French liberals for political inspiration. As Mill Jr. wrote, "The principle, that value is proportional to cost of production, being consequently inapplicable, we must revert to a principle anterior to that of cost of production, and from which this last flows as a consequence,–namely, the principle of demand and supply" (1897, 13). One implication of this inversion of importance was that the theory of supply and demand should, in principle, enjoy explication of the conditions under which it would operate freely and the environments in which it would dominate cost of production; yet precious few of the authors in this second group ultimately devoted much effort to that task. Nevertheless, their rallying cry, this figure-ground reversal as regards the labor theory of "natural price," combined with the supply and demand locution, would soon prove their downfall, since the need to broaden the supply and demand tent, all the while doggedly maintaining agnosticism on what was "natural" about natural price, tended to rob this crew of all conceptual precision or political efficacy. It is no surprise that this bloated and disorganized middle ground would be where William Thornton would choose to mount his attack in the 1860s upon political economy, its confusions on price, and its strictures on wages.

Finally, there did exist a third group of writers rooted primarily in the natural sciences, outsiders to the Ricardian orthodoxy, who had no interest in defending past verities or recent French fashions. They too sought "laws" of the economy; in their no-nonsense instrumental world, the language of "supply and demand" would serve as well as any other to demarcate their quest. However, all notions of reconciliation with the classical labor doctrine were dismissed as futile. These writers are sometimes identified in the modern literature as the "Whewell group" of political economists (Henderson 1996)–Edward Rogers, William Whewell, Dionysius Lardner–although by all rights, Fleeming Jenkin would fit neatly into this category as well. Although they may look very modern in retrospect, they had almost no lasting impact upon their contemporaries in Britain. Partly, this was because the demand and supply organon was deployed in their writings more as a tool of critique of the other rival groups than as engine of analysis, at least until the 1870s; and in part, their influence was confounded by widespread hostility to algebraic models in the British context.

Because it was the second, largest group that provided the prime milieu and target for Thornton's later work, it may prove worthwhile to take a closer look at a few of the key texts which constituted the midnineteenth-century orthodoxy concerning the theory of supply and demand. The leitmotiv of this literature is the repeated accusations launched at others of dire confusions over the deployment of the laws of supply and demand, and endless reiteration of the desperate need for sound definitions, although each subsequent proposal never seemed more satisfying than its predecessors. Malthus, for one, could never make others understand just what he meant by the laws of demand and supply. In his *Principles of Political Economy* (1820) he appeals to Turgot and Say but still feels he must enter a note of caution: "The terms Demand and Supply are so familiar to the ear of every reader . . . [yet] are by no means applied with precision" ([1820] 1966, 36). Paradoxically, everyday usage is held as the arbiter: "[When] society has been divided, in common language, into buyers and sellers, demand may be defined to be the will combined with the power to purchase, and supply, the production of commodities with intention to sell them" (37). What one member of the pair giveth, the other immediately taketh away: "existing market prices are, at the moment they are fixed, determined upon a principle quite distinct from cost of production, and that these prices are in reality almost always different from what they would have been if this cost had regulated them ... the great principle of Demand and Supply is called into action to determine what Adam Smith calls natural as well as market prices" (45–46). Perhaps one can share Ricardo's vexation with this passage, reproduced in his notes on Malthus: "The author forgets Adam Smith's definition of natural price, or else he would not say that Demand and Supply could determine natural price."

Malthus cluttered up the end of his career with screeds assailing others for the inadequacies of their definitions, surely the very last refuge of the pedant. As is frequently the case, the guns were turned on those closest to his own position: "the most culpable confusion of terms which Mr. Mill has fallen into, is in relation to demand and supply; and as he has a more original and appropriate claim to this error than any other English writer... the notice of it is particularly called for" (1827, 44). This prefaced a rambling critique of the surfeit of meanings of demand then prevalent in political economy, only to end up with Malthus's preferred specification(s): "two distinct meanings: one, in regard to the extent, or the quantity of commodities purchased; and the other, in regard to the intensity, or sacrifice which the demanders are willing and able to make in order to satisfy their wants" (244). To preserve a semblance of continuity, this "intensity" was further equated with the labor commanded by the commodity.

No one could rest content with this; everyone felt impelled to propose some variation upon it. Poulette Scrope wrote: "the value (or selling price) of an article at any time and place is determined by the proportion of the demand to the supply at that time and place ... The extent of the Demand for a thing depends upon the intensity of desire for its possession among a larger or smaller group of persons, and likewise upon the means of purchasing it... The supply of goods is determined by the circumstances that affect their production, and is subject to greater variations than the demand" ([1833] 1969, 185–87). Mountifort Longfield took the dramatic step of attempting to restrict its meaning in the interest of rendering the definition more general: "that portion of any commodity which any one possesses and does not intend to consume is supply; the disposition to give something in exchange for it is demand.... if the quantity of the article to be sold is more than sufficient to supply all those who are willing to pay the natural price for it, the competition among the sellers ... will sink the price until the supply comes equal to the effective demand ... In this case the equality between the Demand and the Supply is produced not by diminishing the supply, but by the increased demand consequent upon a diminution of price" (1834, 45, 49). Perhaps one can conjure some empathy with the frustration of the author of *Observations on Certain Verbal Disputes* ..., who complained: "If the degree of demand can itself be altered by the degree of supply, what information is given us by saying, that something depends upon the balance offerees (as it were) between the two?" (in V. Smith 1951, 253).

The writings of John Stuart Mill must have appeared as welcome terra firma amidst an endless Sargasso Sea of shifting definitions. In his youthful work *Some Unsettled Questions in Political Economy* (written 1829–30), Mill had already set about judiciously distancing himself from the hard-core Ricardian position, but equally so from his father's advocacy of Say. It is noteworthy that this positioning took place within the context of one of the first extended commentaries on supply and demand in English not explicitly devoted to either the corn trade or the wages question. Mill's first essay is concerned rather with the theory of international trade–not insignificantly one of the exceptions to the primacy of natural price in Ricardo's system– whereas the second essay tends to mitigate the insistence by Say upon the ironclad impossibility of a general glut. Mill here insists upon a construction of his version of supply and demand as predicated upon market clearing: "Whatever be the commodity–the supply in any market being given, there is some price at which the whole of the supply will find purchasers, and no more. That, whatever it be, is the price at which, by the effect of competition the commodity will be sold" (1897, 13). Nevertheless, the precision promised by this point of satiation was still treated as eluding the effective grasp of the science of political economy: "The result of our most fortunate inquiries will seldom assume a very definite form: it will be more frequently a genus than an individual: we shall seldom be able to accurately measure its dimensions, or to express it precisely in numbers. It is not unlikely, however, that an artificial science might be formed, which should promote the practical discovery of political truth" (70).

Such circumspection, while laudable in an essay, has no place in a textbook; and thus Mill's *Principles of Political Economy* approached the problem of price in an aggressively confident manner. His unfortunate assertion that "there is nothing in the laws of Value which remains for the present or any future writer to clear up" (1965, 456) has oft been quoted as a masterpiece of imprescience; but few seem to have realized the extent to which Mill so qualified Ricardo's cost of production strictures that the "theory" of supply and demand became the de facto doctrinal core of his political economy, or as he put it in an important emendation of the phrase from his earlier essay, "we must revert to a law of value anterior to cost of production and more fundamental, the law of demand and supply" (1965, 583). Much of this doctrinal hubris, this drastic innovation retailed as doctrinal faithfulness to Ricardo plus some unalloyed common sense, has been praised in retrospect as an anticipation of the Marshallian orthodoxy of a half-century later:[7] "Thus we see that the idea of a *ratio*, as between demand and supply, is out of place ... the proper mathematical analogy is that of an *equation*. Demand and supply, the quantity demanded and the quantity supplied, will be made equal. If unequal at any moment, competition equalizes them, and the manner in which this is done is by adjustment of the value" (1965, 467). Yet it is important to take note of the ways in which Mill's doctrine was less forward-looking than profoundly conservative (Packe 1954, 312). Mill only cited two authors in his discussion of the theory of supply and demand: de Quincey and Say. Say is credited with a "clear exposition" (466) of the theory, whereas de Quincey is upbraided for not realizing the extent to which the doctrine remains fully supportive of the Ricardian tradition. For those familiar with Say and de Quincey, these two statements would in essence imply a contradiction, something often encountered in Mill's ex cathedra mode. The sense of misplaced concreteness undoubtedly derived from Mill's desire to uphold the Ricardian catechism that "production" [read: substance] was the root determinant of value, with exchange operations treated as secondary perturbations superimposed upon the fundamental relationships, to such an extent that the two could be dealt with as analytically separable. Thus Mill could still insist that supply and demand constituted "the Law of Value, with respect to commodities not susceptible of being multiplied at pleasure" (468), but then genuflect toward Ricardo by adding, "the value of things which can be increased in quantity at pleasure, does not depend (except accidentally, and during the time necessary for production to adjust itself) upon demand and supply; on the contrary, demand and supply depend upon it" (475). Here, as in many other instances, Mill was simultaneously retailing the two alternative Enlightenment conceptions of balance, with no attempt to distinguish or differentiate them. Were divergences from the theoretically correct price due to accidents not covered in the theory but averaged out in large numbers? Or a set of determinants fundamentally separate from the law of normal price? Or the same lawlike determinants as account for the normal price, just operating on a meta-level, such as perturbations around equilibrium?

In Mill's *Principles*, the theory of supply and demand was both delimited and confirmed in its previous doctrinal commitments. In their prior incarnations, the "laws" of demand and supply were never intended to encompass every possible market phenomenon under every conceivable circumstance; and here Mill's version was no different. He notoriously exempted supply and demand from what would become the paradigm case of catallactics in the neoclassical era, namely the case of the isolated individual purchasing goods for private use. Said Mill, "Purchases for private use, even by people in business, are not always made on business principles" (460). Since psychological motives were not deemed sufficiently regular to underpin economic laws, Mill proposed that the laws of supply and demand might not capture pricing behavior in retail markets, but would be best exemplified in wholesale markets, where "values and prices are determined by competition alone." Thus the notion was promulgated that it was men of business who were the most capable and trustworthy representatives, conduits and mouthpieces for the inanimate forces of production; only they were driven by impersonal dictates of competition, which overrode all specifics of the actual organization and structure of the marketplace. Rather than a description of a process, competition tended to be conflated with the "axiom" that "there cannot be for the same article, of the same quality, two prices in the same market." For Cournot, the *loi de débit* would be most transparently expressed in the case of monopoly, since it was only then that one would expect the one-price rule to hold; whereas for Mill, the fullness of competition in the guise of the one-price rule was the only regime under which there might obtain a "law" of demand at all. Not only did this invert the usual understanding of the significance of price dispersion in a market: it also began a long tradition of repressing distinctive market processes under various rubrics of degrees of "competition" (Dennis 1977).

There was another way in which real existing markets were acknowledged as diverse: foreigners might be exempt from the idealization of "economic man" and full competition to a greater or lesser degree. "In political economy . . . empirical laws of human nature are tacitly assumed by English thinkers, which are calculated only for Great Britain and the United States. Among other things, an intensity of competition is constantly supposed, which, as a general mercantile fact, exists in no country in the world except in those two ... Yet those who know the habits of the Continent of Europe are aware how apparently small a motive often outweighs the desire of money-getting, even in the operations which have money-getting as their direct object" *{Collected Works* 8:906). We can thus observe that the boundaries of the set of markets to which the "laws" of supply and demand would pertain were conveniently imprecise and highly variable; this fact will shortly prove relevant to Mill's own attempts to defend these laws against critics, as well as in understanding the ways in which he diverged from the subsequent neoclassical doctrine.

Mill's textbook bears responsibility for another, rather dismal doctrine in the history of Anglophone economics. Mill took up the prior political valence of popular appeals to supply and demand and hardened it into a rigid dictum about the impotence of workers to do anything about the level of their own wages, which he himself popularized under the label of the "wages-fund." In books I and II of the *Principles*, the wages fund is described in the context of a stationary economy: wages "depend mainly on the demand and supply of labour; or as is often expressed, on the proportion between population and capital.. . nothing can permanently alter general wages, except an increase or diminution of capital itself (always meaning by the term the funds of all sorts devoted to the payment of labour) compared with the quantity of labour offering itself to be hired." In book III this notion has become indissolubly linked to the primacy of supply and demand as a causal explanation of price: "there are commodities of which, though capable of being increased to a great, or even an unlimited extent, the value never depends upon anything but demand and supply. This is the case, in particular, with the commodity Labour" (1965, 469). In books IV and V, a more fluid and dynamic perspective is taken, whereby the working class as a whole might eventually improve its lot through population control, education, and Mill's favorite Golden Mean of "Co-operation" between Labour and Capital; but after all was said and done, there was very little hope held out for the worker in his or her own lifetime.

Mill's tendency to change his mind about political economy under the influence of Harriet Taylor after 1848 has been the subject of much commentary (Packe 1954, 313; Hayek 1951). Nevertheless, it does appear that Mill suffered reservations about how the doctrine of the wages fund was being used, especially after Henry Fawcett's article in the *Westminster Review* in 1860 on strikes. These reservations, in conjunction with the links between the wages fund, the condemnation of the economic impact of trades unions, and the burgeoning significance of the demand and supply doctrine as an explanation of price, set the stage for the momentous intervention of William Thomas Thornton in the 1860s.

The Life of William Thomas Thornton

One reason why Thornton has been neglected in the historical literature is that his station in life, not to mention his publications before *On Labour*, made him a most unlikely candidate for having a lasting impact upon the evolution of British political economy. To a certain extent, his obscurity has masked his role behind the scenes in the evolution of British political economy in the 1860s and 1870s, over and above his publications.

According to the *Dictionary of National Biography*, William Thomas Thornton was born in Burnham, Buckinghamshire, on February 14, 1813. William was the youngest son of Sophie Zohrab, the daughter of a Persian merchant, Paul Zohrab, who had settled in Turkey, and Thomas Thornton, a man involved with international commerce from an early age. Thomas Thornton was perhaps best known for his book *Turkey Past and Present*. (1807), a detailed description of the social, political, and military institutions of the Ottoman Empire. Most of Thomas Thornton's familiarity with the Levant derived from his many years of residence in Constantinople and the surrounding region, pursuing British mercantile interests.

Unfortunately for the young William, his father died on March 28, 1814, on the eve of a voyage to Alexandria to assume the position of counsel to the Levant Company. While this left William bereft of a father at a tender age, after settling in the Moravian community at Ockbrook and reaching majority he received a wide-ranging education abroad. Most notable are his three years' residence with the auditor general of Malta, William Thomas's cousin Sir William Henry Thornton (1786–1859), and his work in Constantinople from 1830 to 1835 on the staff of the consul general. This extensive experience abroad may have influenced Thornton's espousal of more cultural relativist positions later in his writings, in contrast with the more insular run of British political economists.

Upon his return to Britain, in August 1836 William Thornton obtained a junior clerkship with the examiner's office in the East India House, then at the height of its power and prestige. According to his own testimony, his preferment was due to the intervention of Sir James Carnac, then chairman of the East India Company. In December 1837 Thornton was transferred to the marine branch of the secretary's office. Again by his own testimony, the duties of the office were not onerous, permitting him to prepare for his debut as an author. *Over-population and Its Remedy* (1846) was his anti-Malthusian tract, which inverted the conventional wisdom in maintaining that "the original cause of overpopulation is almost invariably misery." At this early stage in his career one can observe a nascent fascination with the wages fund doctrine. He accepted that wages were determined by the ratio between the "fund" and the population of laborers but questioned the extent to which the denominator conformed to simple stories of immiseration. In this work Thornton first stated his lifelong theme that the cultural experience of being lifted out of poverty would not render the subject feckless and lazy and profligate, but rather was the most generally assured method of fostering a set of behaviors which would maintain prosperity. His indictment of Malthus therein was that he "overlooked or undervalued the tendency which the possession of property has to engender prudence, and seems, indeed, to have thought that the quality is rarely to be found among members of the labouring class, except under the pressure of misery" (270). Thornton instead believed that there might exist a low-level trap in economic development, according to which the hardscrabble struggle for existence would actually lower living standards. He also revealed a skepticism toward the benevolent progress of natural forces, something that would subsequently grow in importance, noting situations where workers "are too numerous to earn a competent subsistence for themselves and their families, competition takes place amongst them: each, in his anxiety to obtain employment, offers to accept lower wages than he requires for his comfortable maintenance ... Neither has this state any tendency to correct itself. Whatever point populations may attain, it can with equal ease at least maintain itself there" (3–4).

However, in 1846 Thornton felt compelled to couch his assault on the Malthusian consensus in terms which left the orthodox concepts of supply and demand unquestioned. This tentativeness is revealed in passing in his commentary on the Poor Laws: "It cannot be denied that in this instance the rate of wages was in part determined by the price of provisions, but this can only happen where the circumstances which naturally regulate the price of labour are arbitrarily interfered with. When the money price of labour is suffered to adjust itself according to the proportions between the supply and the demand, it will remain unaffected by any variations in the price of provisions or of other commodities" (227). Initially closer to Malthus than to Ricardo on questions of price theory, Thornton was situated somewhere in that large second group identified above, consisting of those inclined to elevate supply and demand to leading roles in political economy, but with the proviso that there was plenty of room for concerted action on the part of the state and of the actors to lift the poorest members of society out of penury. In this regard, he resembled no major contemporary figure in the British context so much as John Stuart Mill.

This resemblance raises the very important issue, perversely avoided by most historians of economic thought but openly acknowledged by general historians (Packe 1954, 387), of the close and prolonged personal relationship between William Thomas and Mill Jr. As he relates in his memoir, Thornton knew Mill by sight at the India House, but he had no occasion to have a conversation with him until he sent him a copy of his *Over-population* in 1846. As he told it, “A day or two afterwards he came into my room to thank me for it; and during the half-hour’s conversation that thereupon ensued, sprang up, full grown at birth, an intimate friendship, of which I feel that I am not unduly boasting in declaring it to have been equally sincere and fervent on both sides. From that time for the next ten or twelve years, a day seldom passed without, if I did not go into his room, his coming into mine, often telling me as he entered that he had nothing particular to say; but that, having a few minutes to spare, he thought we might as well have a little talk” (1873a, 34–35). This working relationship developed into a close friendship which was enriched by discussions of many philosophical, intellectual, and economic issues, described primarily in Thornton’s eulogy to Mill. Indeed, in many ways Thornton owed his elevation in intellectual stature to his friendship with Mill. For instance, we know that in 1850 Mill wrote to the editor of the *Westminster Review* proposing Thornton as a contributor (1972, 47). As Mill once wrote to Cairnes, “Thornton is a person I particularly respect and like. In perfect candour, sincerity and singleness of mind few men come near him” (in O’Brien 1943, 274). As Mill proceeded to vouch for him, others began to take him more seriously. In 1856, when Mill was promoted to examiner at the India Office, he made it a condition of his acceptance that Thornton be appointed assistant examiner of public works. Yet as time wore on, much more than mere intellectual issues bound the two together.

In times of personal crisis or distress, one would often turn for assistance to the other. In Thornton’s case, his perennial ill-health was periodically the cause for alarm. Once when Thornton suffered from nervous exhaustion that kept him away from his position for over a year in 1857, Mill carried his workload at the India Office so that Thornton would not lose his position (Thornton 1873a, 35). This intervention undoubtedly saved Thornton’s career in more ways than one, since it coincided with the transfer of the East India Company’s administrative functions to the India Office, after the Sepoy Rebellion and the conveying of the company’s territories to the Crown. Upon recovery, Thornton was appointed secretary of the newly constituted Department of Public Works. For his part J. S. Mill, immobilized by his bereavement over the death of his wife, entrusted to Thornton the task of placing Harriet Taylor’s obituary in London newspapers:[8]

> Hotel d’Europe, Avignon
> Nov. 9, 1858
>
> My Dear Thornton–The hopes with which I commenced this journey have been fatally frustrated. My wife, the companion of all my feelings, the prompter of all my best thoughts, the guide of all my actions, is gone! She was taken ill at this place with a violent attack of bronchitis or pulmonary conjestion–the medical men here could do nothing for her, & before the physician at Nice who saved her life once could arrive, all was over.
>
> It is doubtful if I shall ever be fit for anything public or private, again. The spring of my life is broken. But I shall best fulfil her wishes by not giving up the attempt to do something useful, and I am not quite alone. I have with me her daughter, the one person besides myself who most loved her & whom she most loved, & we help each other to bear what is inevitable. I am sure of your sympathy, but if you knew what she was you would feel how little sympathy can do.
>
> We return straight to England but shall be detained here for some days longer & I beg of you the kind office of inserting the inclosed notice twice in the Times & once in the Post, Herald & Daily News & in the principal weekly papers. Believe me my dear Thornton, very sincerely yours, J. S. Mill

Thornton was the right person for this job, given that he was an intimate of Harriet Taylor’s circle as well as Mill’s. For instance, it was he, along with Arthur Ley, who was a trustee of the estate of John Taylor, the long-suffering first husband of Harriet Taylor (Packe 1954, 382).

If anything, after Mill bought a cottage in Avignon to be near his wife's grave, Thornton and Mill grew closer. Although Mill retired from the India Office in 1858 and was frequently absent from London, Thornton was always treated as a welcome guest. It was Thornton who was entreated to visit Mill and Harriet's daughter Helen Taylor in Avignon, and Thornton who provided others in the early 1860s with reports on Mill's emotional status (Elliot 1910, 1:261–62). Mill, when writing to Thornton from Avignon as late as 1869, makes reference to "your room" as being refurbished (*Collected Works* 16, letter 1380).

It is my view that much of Thornton's subsequent literary output, from 1848 until roughly 1870, in the field of political economy (but most emphatically *not* his poetic or philosophical writings!) should be regarded as the product of a prolonged discussion, shading imperceptibly over into collaboration, with Mill. John Stuart Mill had few close friends; and fewer still whom he regarded comfortably as intellectual equals. This dialogue in and of itself should constitute just cause for a substantial reevaluation of Thornton's writings. One of the early fruits of mis long relationship was Thornton's tract *A Plea for Peasant Proprietors* (1848). As mentioned in his first edition of *Principles*, Mill was greatly concerned over the plight of the laboring peasantry in England and Ireland. Thornton's *Over-population* had argued that the settlement of "wastelands" by small peasant proprietors would constitute one plausible remedy for the Irish famine, and Mill praised this analysis in his *Principles* (1965, 997–99), calling it "honourably distinguished from most others which have recently been published [this in 1849], by its rational treatment of the great questions affecting the economical condition of the labouring classes." Sharp criticism by others of the thesis that small landholdings would be economically viable (e.g., Anonymous 1847), and that population growth would simply wipe out any temporary gains, prompted Thornton to redouble his efforts toward a program for Irish resettlement, and a vindication of the social and economic consequences of a wide distribution of smallholders. Mill read the proofs for this second book, and there is reason to think much of his stamp is imprinted upon it.[9]

Nevertheless, the *Plea* would seem in retrospect Thornton's least satisfactory economic work. There is a penchant for excessive minutiae and the retail of anecdote as a replacement for concerted marshaling of evidence in all of Thornton's writings, yet here these vices tend to overwhelm his other virtues. For instance, that certain forms of smallholdings seemed to flourish on the Channel Islands would seem to bear little relevance for the larger agricultural infrastructures of Ireland or England, a point which appears to have eluded Thornton. Likewise, isolated national statistics of average agricultural production per acre did not begin to confront the issue of whether scale economies in agriculture were as pervasive as they appeared to be. Furthermore, Thornton did indulge a weakness for writing "conjectural history," a tendency already noted by Brentano, and in the *Plea* given free rein in the treatment of Irish history as well as ancient Greece. It is worthwhile to note, however, that an entire chapter was given over to the effects of peasant proprietorship in France. It seems that Thornton was here for the first time forced to confront the vexing French problem of explaining why the freely operating grain markets there were not able to stem the tide of subsistence crises; owing to his extensive experience with other cultures, Thornton could not accept the conventional wisdom that the problem could be traced to the absence of large-scale capitalist agriculture and the atavism of *morcellement*.

Outside of Mill and his small circle of confidants in the 1850s, it would seem that Thornton was not deemed a major thinker or accorded much respect among the literati of the day. The *Plea* was essentially ignored in the periodical press, even though Mill in the second edition of his *Principles* called it "the standard work on that side of the question"; and there followed a notable hiatus in Thornton's output in political economy, beginning in 1854 and lasting roughly a decade. Some of this might have been attributable to the illness and disruptions to the India Office mentioned above; but part of the explanation must lie in Thornton's advocacy of what were regarded as lost causes, as well as perceived flaws in his own personality. To put it bluntly, there were few others like Mill who treasured Thornton's tenaciousness in argument and his deficiency in the civilities associated with a certain stratum of the leisure classes in Victorian Britain. Our primary evidence of this latter character trait comes from the minutes and records of the Political Economy Club.

From 1847 until his death, Thornton was an active member in the Political Economy Club of England. This was a monthly conclave of influential scholars and business people, founded by David Ricardo and sustained by his followers, to address the major issues affecting the new science of political economy. The meetings consisted of an evening of supper and an after-port discussion of a question posed by one of the members. Thornton's entrée into this august conclave undoubtedly was owed to Mill's intervention. In the thirty-three years that Thornton was a member of the club, he formally presented questions on fifteen occasions (Political Economy Club 1921). These questions give us a very good indicator of Thornton's enthusiasms; but they also provide us a fair calendar of the years in which Thornton was actively engaged in political economy. We reproduce the full schedule of these questions below, divided into three discrete phases.

Questions Posed by Thornton at the Meetings of the Political Economy Club

February 3, 1848. Is the system of letting small pieces of land to agricultural labourers, commonly called the allotment system, open to any valid objection, as a means of improving the condition of those labourers?

June 6, 1850. What reason is there for believing that the recent approximations toward Free Trade in food, have affected the ability of the country to bear the burthen of the National Debt?

May 1, 1851. Is not the Ricardo theory of Rent unnecessarily artificial, and might not another be devised less complicated, yet equally accurate and more comprehensive?

June 5, 1851. Instead of being true, as is frequently asserted, that taxation presses with disproportionate weight on the poor, would it not rather appear that no taxes, other than Protective duties, can permanently diminish the income of the labouring classes?

February 1, 1852. Can it, in any circumstances whatever, be advantageous to raise the money required for public expenditure, by means of a loan, instead of immediate taxation?

June 2, 1853. What is the most correct definition of Capital?

May 4, 1854. Are Copy-right and Patent-right founded on justice, or merely on sufferance, and are not those terms really misnomers?

December 7, 1854. What is the foundation of the Tenant Right of Ulster?

June 5, 1862. Can any Income Tax, and, *a fortiori*, an uniform Income Tax, be otherwise than at variance with the just principals of Taxation?

July 1, 1864. What would be the effect on Literary Produce and Literary Producers of a total abolition of Copyright?

December 7, 1866. What is the meaning of Supply, and what of Demand? Is it correct to say that supply and demand determine price? If not, in what manner is it that supply and demand affect price?

February 6, 1874. Is it possible for the construction of a Railway, the purposes for which are purely commercial, and which cannot by the most judicious management be made to yield profit at the current average rate on its cost, to have been other than a bad investment of a portion of the National Capital?

May 7, 1875. Political Economy being commonly regarded as the Science which treats of National Wealth, in what sense should the word Wealth be understood when used in politico-economical discussions?

June 7, 1878. Is there really such a thing as Economic Law? If so, how far should Economic Law be defined, and what specimens of it can be adduced?

July 4, 1879. Is it possible, and if possible, would it be desirable, to establish and maintain Bimetalism in India, without regard to the monetary arrangements of any other country?

From the materials surviving from the Political Economy Club, it seems safe to infer that Thornton was not one of the social favorites at these gatherings. Leslie Stephen was one of the least tolerant, reporting, "I am suffering the torments of the damned from that god-forgotten Thornton, who is boring on about supply and demand ... He is not a bad fellow, but just now I hate him like poison."[10] Another of Thornton's frequent sparring partners was William Newmarch.[11] An extract of a letter from L. H. Courtney to Sir Louis Mallet describes the setting of one argument:

Dear Mallet,

I share your regrets at the apparent decline of decorum at the Political Economy Club. Last Friday the breaches of manners were sadly conspicuous. One officer must not find fault with another, but the truth is that our treasurer is habitually too contemptuous of views other than his own–not infrequently wider than his own–and this characteristic does not abate as the years pass. With his rough disdain and Thornton's tendency to querulous irritability there must be occasional splutterings, and the only way of keeping them down is for you and other members to attend as often as convenient to discountenance them by quietly maintaining the rules of debate.[12]

On another occasion, Sir J. Macdonnel tagged Thornton a "disruptive revolutionary influence," but nevertheless a "useful solvent [who] had the art of putting questions disconcerting to the dogmatic spirit, and he had a vision, temperate of a world that was to come–more questions than he himself could answer" (1921, 344).

It is difficult to imagine that such a cantankerous fellow with such unseemly enthusiasms would have been suffered so stoically by the members of the club without the obvious and repeated endorsement of Mill. In the first phase of Thornton's career, his questions reveal a concern with agricultural issues which derived from an essentially anti-Ricardian stance, well in line with his earliest publications. This stance would not have endeared him to the members of the club, and there is no evidence that he succeeded in winning any of them over to his position through his efforts. In 1853–54 Thornton branched out into issues of capital theory and intellectual property rights, although he would never write about these subjects specifically. Instead, it is hard to escape the impression that Thornton grew rather disappointed with political economy; for instance, his participation in the Political Economy Club experiences a hiatus of eight years beginning in 1855. In its place, in the mid-1850s he turned to poetry, publishing "The Siege of Silestria" in 1854, *Zohrab and Other Poems* in 1854, and *Modern Manicheism, Labour's Utopia and Other Poems* in 1857. One of these poems, written in 1854 in the form of an epistle to Mill, confesses his disaffection with political economy:

Dear Mill, whose friendship's kindly emphasis
Approved my first work, and encouraged this.
Scarce will you ask, why, from old studies turned,
My name unknown, a pension yet unearned.
Problems abstruse and tough, no more I try,
Of dark Political Economy.
Digging no more in serious dissertation
To trace the source of "Over-population,"
Nor publishing what hidden treasure lies
Deep in the soil of "Peasant Properties."

Unfortunately, Thornton's Muse fared no better with poesy, even given the Victorian predilections for iambic pentameter, heroic couplets, and deliciously awkward rhymes like "try" and "Economy." (I particularly relish his habit of footnoting his poems to "explain" his egregiously obscure allusions. Here we can savor the trademark practices of later modernists such as T. S. Eliot *avant la lettre.)* One reviewer of his later translations from Horace accused Thornton of a deficient ear and a want of metrical grasp, while backhandedly complimenting his seventeenth-century quaintness (Ellis 1878). It seems safe to observe that Thornton's poetical works would not have cemented his intellectual reputation for future generations. Hence, at the age of forty, that fearsome watershed in many lives, there was very little to indicate that Thornton would ever amount to much more than a competent bureaucrat in colonial government service.

The situation was changed dramatically in the mid-1860s, for reasons that we have been unable to fully divine. While we know of no particular landmarks dating from that era in Thornton's personal life, there is reason to suspect the hand of Mill in encouraging Thornton to return to political economy. He resumed attendance at the Political Economy Club in 1862, and a prodigious stream of publications on wages, unions, and the treatment of labor in political economy commenced in 1864. In part this was a response to British political initiatives of the 1860s to gain the suffrage for workingmen and legal legitimacy for trades unions (see below); and in equal part it must have been sparked by Thornton's conviction that there was something fundamentally flawed about the conventional wisdom concerning price theory, a wisdom, it must be noted, best exemplified by his friend's own *Principles of Political Economy*. In that text, Mill's abstract treatment of demand and supply did not correspond very well to the newly added passages, such as the following from the 1862 edition, where he intended to signal a much more favorable inclination toward certain forms of union organization:

> [D]emand and supply are not physical agencies, which thrust a fixed amount of wages into a labourer's hand without the participation of his own will and actions. The market rate is not fixed for him by some self-acting instrument, but is the result of bargaining between human beings. . . those who do not "higgle" will long continue to pay more than the market prices for their purchases. Still more might poor labourers who have to do with rich employers, remain long without the amount of wages which the demand for their labour would justify, unless, in the vernacular phrase, they stood out for it; and how can they stand out for terms without organized concert? What chance would any labourer have who struck singly for an advance of wages?.... I do not hesitate to say that associations of labourers, of a nature similar to trades unions, far from being a hindrance to the free market of labour, are the necessary instrumentality of that free market. (Mill 1965, 932)

Here in a nutshell was the position that Thornton chose to critically examine and elaborate upon in the *Fortnightly Review* over the course of the 1860s, and then republish together as the first edition of his epoch-making book *On Labour* (1869). Since 1844, Mill had been desirous of repudiating the "hard, abstract mode" of treating the "labour question" *(Collected Works* 13:645); by the early 1860s he was endorsing a pamphlet by Thomas Dunning, *Trades Unions and Strikes*, which argued that only by combination could workmen negotiate on a basis of equality with employers. Essentially, Thornton set out to expound in greater detail Mill's position vis-à-vis the benefits of union organization, but fairly quickly concluded that if this doctrine were to hold, revision of the "laws" of supply and demand would be required to restore a semblance of consistency to Mill's position. In 1866, both in the *Fortnightly* and at the meetings of the Political Economy Club, Thornton first aired this conclusion.[13] It was the pained reactions to his presentation in 1866 which provoked the disparaging comments from other Clubmen about the deficiencies in Thornton's character which we quoted above. Nevertheless, at least among the cognoscenti, and the readers of Mill's preferred outlet the *Fortnightly*, Thornton's heresies were familiar, dating at least from 1866.

Let us be quite clear about this. Thornton's positions on supply and demand and the legitimacy of trades unions were known to Mill at least from 1866, and perhaps before, largely because he helped thrash them out in concert with his friend Thornton. Both Mill and Cairnes gave Thornton comments on the manuscript before the book was published.

Presumably, Mill facilitated this early exposure to other prominent political economists to assay their reactions, and it took his intervention to pave the way for immediate reviews in the *Fortnightly* and other publications. But there is more. Research at the British Library has uncovered evidence that Mill had some involvement in the actual publication of *On Labour*. Mill was indeed more sensitive than Thornton about the politics of changing economic opinion, as revealed by his comment in a letter to Cairnes in 1869: "It is very amusing in this and other cases to see how the tyros in Political Economy think themselves bound to give no quarter to heresies, being afraid to make any concessions which their masters make" *(Collected Works* 16, letter 1418). As the following review notes of a Macmillan editor indicate, Mill was fully cognizant that the book was being positioned to provoke a controversy:

> Review of On Labour Manuscript:
>
> I have thought about the Thornton Book. The following considerations sum to the point.
>
> Mill's testimonial could not very well be made known on the surface of the book. Even if it could, just now it would not be so very effective, though it might become so. Thornton's book is not of the size or caliber to be a standard work or a text-book. It has already been published in the F[ortnightly].R[eview]., and the students of economic questions who would otherwise have bought it are now familiar with it.
>
> On the other hand is the very weighty fact that the subject will shortly be *the* subject of the day–and will probably continue so for a considerable time to come; and everything bearing on it will be brought. And Thornton is an authority in economics, as the author of the "Plea for Peasant Proprietors." It will be a *risk*, decidedly, I think-though the book is one which would look well in your list.[14]

We shall describe the intellectual content of *On Labour* below; for the nonce we restrict our attention to how this situation has been treated in the historical literature. It is our contention that historians, following the lead of some subsequent commentators such as Cairnes, have reified the appearance of *On Labour* and J. S. Mill's review in the *Fortnightly Review* in 1869 as the earth-shattering fissure in the homelands of British classical political economy, the Recantation of the Wages Fund Doctrine. In this construct, Thornton is relegated to the marginal status of Rosencrantz (or is it Guildenstern?), passive observer of Hamlet's solo deconstruction of Denmark.[15] To their credit, Evelyn Forget (1992) and Mark Donoghue (1997) have both smelled something rotten, and have suggested alternative (Copenhagen?) interpretations. Forget asserts that "Mill's recantation was not motivated by internal inconsistencies, but was a calculated political act" (32). Donoghue goes further, suggesting that Mill never regarded himself as recanting something so grand as "the wages-fund doctrine." We shall propose a third interpretation, buttressed by our new evidence, which restores Thornton to his rightful role as an independent and active agent, uniting Forget and Donoghue in something resembling a convex combination.

In fact, neither Mill nor Thornton initially regarded the theses of *On Labour* as anything other than tangentially concerned with "the wages-fund." Indeed, in the first edition of *On Labour*, the wages fund was mentioned only in a footnote.[16] Instead, the objective was to flesh out the argument broached in Mill's 1862 edition of the *Principles:* supply and demand for labor were neither mechanical nor inevitable in wage determination; the steadfastness of will and bargaining behavior of masters and men mattered; unions could help offset an asymmetry of bargaining power in the wage relationship; and unions could serve longer-term goals of education and social improvement of the lot of the working class. On every point, Mill and Thornton were in full concert. Both also thought that workingmen were vulnerable to pernicious and wrong-headed analysis of their predicament by contemporary socialists, although they might have differed as to who the socialists were in their rogue's gallery of error. Both felt the need for a text which would codify what they both anticipated would be the orthodox case that unions were a necessary complement to the operation of the market, once a society reached a certain level of development. When Mill was in London, the two regularly discussed these issues; when he was in Avignon, their letters reveal that these were the overriding shared concerns.

Nevertheless, Thornton could never be considered a stalking horse for Mill. That he was his own man is what endeared him to Mill–let us not forget, the author of *On Liberty* as well as *Principles of Political Economy*. The author of *On Liberty* argued that truth was not found in consensus, but derived from the process of individual dissent. So Thornton was encouraged to set out on his own path to determine what he believed exactly would have to be given up to prosecute the case outlined in the previous paragraph. Mill thought that a revised understanding of supply and demand would suffice to make the case; Thornton, notoriously, believed rather that the laws of supply and demand would have to be given up. Mill, the serene proponent of common sense, believed "that what is true in the abstract, is always true in the concrete with proper *allowances" {Collected Works* 14:326). Thornton the iconoclast sought rather to base the case for unions on the bare minimum of theoretical presumptions: in effect, just the axiom of self-interest and a few symmetry principles.[17] In contrast with Mill, he signaled an unwillingness to depend upon Mill's or any other version of utilitarianism to ground his account. That Mill was fully aware of this well before the appearance of *On Liberty* can be gleaned from a letter to Thornton dated 19 October 1867:

> I have just finished reading your Chapter in the Fortnightly & I put down my observations while my mind is full of its contents. In execution I think it excellent & of good augury for the success of the book... I expect that the subsequent chapters will be equally well executed & that I shall agree with all or most of your practical conclusions. But in its principles the chapter does not carry me with it. I find in it what I always find where a standard is assumed of so-called justice distinct from general utility ... Not only do I not admit any standard of right which does not derive its sole authority from utility, but I remark that in such cases an adversary could always find some other maxim of justice equal in authority but leading to opposite conclusions.... I have stated strongly the fault I find with your Chapter. It would take me a considerable space to set out all the good I find in it. To mention only one thing, the book will be very servicable in carrying on what may be called the emancipation of pol. economy–its liberation from the kind of doctrines of the old school (now taken up by well to do people) which treat what they call economical laws, demand and supply for instance, as if they

were laws of inanimate matter, not amenable to the will of the human beings from whose feelings, interests, & principles of action they proceed. This is one of the queer mental confusions which will be wondered at by & by & you are helping very much in the good work of clearing it up. *(Collected Works* 16, letter 1150)

This explains why, in a seeming paradox, both Forget and Donoghue could actually be right. Mill could orchestrate an endorsement of Thornton's *On Labourboth* behind the scenes and in print, because he thought the political objectives were fundamentally sound, and moreover, the need for a synoptic text treating the theory of unionism was imminent. Yet simultaneously, he could disagree with Thornton's rejection of his version of price theory and his utilitarianism, and still cheerfully endorse the book, because he himself did not think he was "renouncing" much of anything–it was those epigones, those "tyros of Political Economy" who had turned the doctrine of supply and demand into a wicked device, a "hard, abstract" object to prod and torment the working classes with its dismal prognostications. Of course no one, including Thornton's most loyal follower Cairnes, was impelled to share his view; and by and large the self-identified orthodoxy did not.[18] Instead, Mill's endorsement of Thornton was treated initially as a gracious but somewhat inexplicable gesture to an old friend; and then later, as a moment of deplorable weakness which in a few decades brought down the whole jerry-built structure of British classical political economy. Mill did not live to experience the latter collapse, but he did manage to enter a demurrer regarding one of the culprits behind it.[19] The very idea that there was something so dramatic as a "recantation of the wages-fund" was a construct of those who came after, such as Cairnes, Taussig, and Jacob Hollander. It was these late classical political economists who feared that their world was turned upside down; it was the fledgling neoclassical like Jevons who donned their white hats and put it right again, thus supporting the recantation narrative. These ruptures are important for the student to remember, especially after Marshall sought to impose a bland facade of continuity over the whole episode by imposing a separate peace and inventing a fanciful history of price theory out of whole cloth.

Having insisted upon a proper understanding of the motives and role of Mill, we now return to the life of Thornton. *On Labour* and the subsequent furore provoked by its bold theses rendered Thornton something of a celebrity in political economy circles. The book was rapidly translated into Russian, German, and Italian; his *Plea* was reprinted in 1874; now not only the *Fortnightly* but the *Cornhill* and the *Contemporary Review* were happy to publish his occasional pieces; and Macmillan even sanctioned a second edition of *On Labour* (prodigiously expanded) in 1870, a year after the first. In 1873 Thornton was presented with one of those peculiarly British distinctions, a "Companion of the Order of Bath," upon the recommendation of the duke of Argyll. More importantly, in the critical decade of the 1870s Thornton was the writer one just had to confront if one had any hope of gaining one's spurs in English political economy. J. E. Cairnes's book *Some Leading Principles of Political Economy* (1874) was one long wrangle with Thornton. Fleeming Jenkin's classic papers on supply and demand were intended primarily to upbraid Thornton. Jevons, with Jenkin serving as intermediary, was also responding to Thornton in his *Theory of Political Economy*. Edgeworth's *Mathematical Psychics* was the ultimate utilitarian riposte to Thornton's disdain for utilitarianism. And last but not least, Marshall without Thornton is like the Prince ... well, one readily gets the drift. (For more of this argument, see chapter 14.)

It is instructive to take the measure of those whom Thornton deems worthy to answer in the last decade before his death. Cairnes here holds pride of place, precisely because he was so very close to Mill; and that does help to explain why each of the two accorded such ample courtesy and attention to the other. Longe is acknowledged after the fact, only to be written off as irrelevant. Mill is repeatedly revisited as a fount of authority and touchstone of dissension, even after his death. The new breed of utilitarians, by contrast, did not warrant individual confrontation; instead, Thornton sought to deal with them *en masse* in his broadside "Anti-utilitarianism" (1870, republished in 1873 in his *Old-Fashioned Ethics)*. And that exhausts his reference set within political economy. This failure to acknowledge others was not due to lack of acquaintance or opportunity; indeed, Thornton became very active in the Political Economy Club in the mid-1870s, proposing such impertinent questions as "Is there really such a thing as Economic Law? If so, how far should Economic Law be defined, and what specimens of it can be adduced?" However, it seems that Thornton did not regard his fellow members as rising to the lofty standard of discussion he had grown accustomed to with Mill. He would rather turn his critical attention as an author to someone like

Thomas Huxley, whose “naturalism” was the most diametrically opposed to his own position.[20]

In the mid-1870s Thornton returned to what was clearly his first love, the specifics of land tenure systems, irrigation works, and other artifacts of the bureaucratic levers of control and economic development. In his last substantial book, *Indian Public Works* (1875), he put on display the economic specifics which had absorbed much of his working life; in this respect he diverged from Mill, who largely excluded explicit acknowledgment of his India House work from his writings (Zastoupil 1994). Thornton’s book tracked the controversies over Indian railroads, ship canals, telegraph wires, and educational establishments as the nitty-gritty of providing infrastructure in which markets operate, something which underlay much of Thornton’s theoretical approach to markets. Among its virtues, it surveys the late classical case for the legitimate undertaking of public works, suggesting that market rates of return may be an inadequate guide for choice of projects in poorer or less developed countries: there, the second-round effects of drawing out “idle capital” might more than offset the costs of what initially appear to be unpromising projects. Thornton was very critical of the “Dalhousie plan” which sought to draw private investment into railway construction through investor guarantees: the result, he claimed, was a cost per mile far above that experienced in direct government construction. The book was not entirely disengaged from Thornton’s previous preoccupations, however; in it, for instance, he recommended that the Indian government consider various cooperative schemes to deal with problems of motivating and supervising labor (1875b, 90).

By all accounts, William Thornton lived out his last years in Cadogan Place near Sloane Street enjoying the respect of his India House colleagues and the joys of classical Latin literature, publishing a volume of *Word for Word from Horace* in 1878. Judging from his personal estate of roughly eight thousand pounds, he also enjoyed the modest prosperity of a colonial bureaucrat of middling rank.

William Thomas Thornton died on June 17, 1880, and according to his desires was buried in a wicker coffin in an unbricked grave. He was survived by his wife, Elizabeth Evelyn Thornton (1818–1903), and a son, Edward Zohrab Thornton. While it appears that some of his heirs shared in his penchant for classical literature, sadly none felt impelled to perpetuate or preserve his views on political economy.

The British Trades Unions Movement as a Context for the Rupture in British Political Economy

While historians of economic thought have been busy rooting about asking who should be charged with having killed the wages fund, it seems that they have overlooked a phenomenon much more relevant for the evolution of political economy in the 1870s, namely, the political movements which served to legitimate trades unions in Britain. Sir John Hicks once wrote: “The sixty years from 1870 to 1930 were in Britain the time of the rise of the Labour Movement; thus it was not surprising that the British post-classics (Marshall, Edgeworth, and Pigou in particular) should have had labour problems very much on their minds” (1983, 71). Yet far from passively reacting to a new-found empirical development–“I say, don’t you think it’s high time we looked at these union chaps!”–the British neoclassical movement was instead provoked by the earlier political problem of trades unionism. Hicks’s timing was off, at least by a decade.

The saga of the demise of Chartism, the rise of the new model unions, and the foundation of the International Working Men’s Association and the Trades Unions Congress has been often told. We direct the reader to a number of fine histories of this development for an appreciation of the context for the rise of neoclassical economics in the 1870s.[21] Some have asserted that “Political economy suffered a sharp decline in prestige and influence in Britain after 1870” (Mason 1980, 565); and one of the most compelling reasons for the slide was that numerous representatives of classical political economy persisted in their mantra that unions could not “permanently” alter wages nor benefit society, all the while that unions were growing in strength and numbers as a political force. The demise of classical political economy in Britain was intimately bound up with the various political and economic reform movements of the 1860s and 1870s, something overlooked by those doggedly intent on operating only in the rarefied realm of pure ideas.

After the failure of the Owenite and Chartist movements in the 1830s and 1840s, a number of “new model” unions took form in the later 1850s, at first limited to particular trades, and favoring the better-paid and -educated strata of the labor hierarchy. Foremost among these were the Amalgamated Society of Engineers (ASE) and the Amalgamated Society of Joiners and Carpenters, two unions which would provide much of Thornton’s stock of exemplars. The ASE experienced rather stunning expansion, from eleven thousand members and an annual income of 22,000 pounds in 1851 to twenty thousand members and 52,000 pounds in 1860; and by the time of Thornton’s attention, 33,000 members and 83,000 pounds in 1866 (Howell 1890). This occurred during a period of pronounced expansion of employment of engineers, growing from 75,000 in 1841 to 130,000 in 1851 and 198,000 in 1861 (Lee 1979). More importantly, it had become apparent to those closest to the industry that the ASE had managed to raise average wages of the engineers. Even after a generation or more of Cliometrics, there exists very little in the way of solid quantitative data which allows us to get specifically at this issue; however, the earlier work of Arthur Bowley did allow some generalizations to be made (Bowley and Wood 1905; 1906). Although the data really only commence in 1860, it appears the ASE managed to persistently raise the standard wage rates in a number of areas in England, and this in an era of falling prices. Bowley and Wood also provide some evidence that wages paid to nonunionized trades in unionized firms tended to rise in tandem with elevated standard union rates. At least before 1873, the period most germane to Thornton’s claims, it was difficult to argue that the ASE had produced deleterious effects upon the growth of the firms where unionization had taken hold. Therefore, the first and most immediate challenge to the time-honored laws of political economy derived from the success of the new model unions.

The unions, while often claiming to restrict themselves to parochial bread-and-butter concerns, were in fact in the vanguard of various broader-based political movements to redress political inequities. The most salient example was the relationship of union agitation to the Reform League in the early 1860s, which culminated in the Reform Act of 1867, extending manhood suffrage and doubling the electorate. That the extension of the suffrage and the legitimation of unions were often regarded as a single spreading conspiracy from the vantage point of the British Right is best instantiated by the dyspeptic writings of that favorite of the first generation of neoclassicals, Herbert Spencer: “And if there needs a demonstration that representative equality is an insufficient safeguard for freedom, we have it in the trades unions already referred to; which, purely democratic as is their organization, yet exercise over their members a tyranny that is almost Neapolitan in its rigour and unscrupulousness... Hence the great mass of the new boroughelectors must be expected to act simultaneously, on the word of command being issued from a central council of united trades" (1872, 378–79). One measure of the hairline fractures which such middle-class reform movements were inflicting on political economy was that John Stuart Mill, the great self-proclaimed "socialist," did not join the league, whereas his follower Cairnes did. Margot Finn argues that the mobilization around the extension of suffrage acted to move the goalposts for other middle-class reform initiatives: "Determined both to pre-empt the escalation of class sentiment incited by the Reform League speakers and to seize the initiative of reform from the Tory government, bourgeois liberals now offered working-class radicals new varieties of liberal argument that conceded, albeit reluctantly, the very legitimacy of abstract political rights . . . [and] the efficacy of trade unions as political agents... the escalation of class-consciousness under the aegis of the Reform League encouraged an efflorescence of bourgeois radical agitation in which left-wing liberals endorsed lines of political argument that they had earlier denounced as socialist delusions of the working class" (1993, 249, 252). This interplay of political reform and trades union legitimation is a necessary backdrop for the publication of *On Labour*.

The perceived link between unions and reform agitation conjured the prospect of a state backlash right on the threshold of the successful extension of the franchise. Using as a pretext the "Sheffield outrages" of 1866 and the case of *Hornby v. Close* in 1867–a Queen's Bench ruling which suggested that unions could not prosecute thieves for their stolen funds since they organized strikes in restraint of trade, which violated common law–the government announced the formation in 1867 of a Royal Commission to look into all aspects of trades unions. The outcome of the inquiry was by no means a foregone conclusion, inducing both sides to sharpen their nibs and occupy strategic positions in the *Quarterlies* and the *Reviews*, which should signal that the dispute over the legal and economic legitimacy of unionism had reached a fever pitch precisely in the period when Thornton composed *On Labour*.

At this juncture, classical political economy was retrieved from the realm of mere apologetics to become a tool for stripping the trades unions of all legal protection. The language of the "immutable laws of political economy" took on an especially ominous heft and virulent tone in the mid-1860s; and most of the heavy lifting was carried out by the particular "laws" of supply and demand. For example, the *Times* of 27 November 1867 regarded the effulgence of labor activism as an effort to subvert the laws of political economy (Finn 1993, 245). Henry Fawcett wrote: "If trades unions are permitted to prevent this free passage of labour from one employment to another, wages may permanently maintain an artificial advance; but trades unions can only exert such an influence by resorting to a social tyranny, which is in every sense illegal and unjustifiable." In a comparison which would shortly assume deeper significance, one P. H. Rathbone wrote in 1867, "let it be understood that labour is only a commodity (like fish); that employer and employed stand in relation to each other merely as buyer and seller of the commodity; and that the laws of political economy, rightly understood, are as much the laws of Providence as the laws of gravitation" (in Clements 1961, 96). Frederic Harrison, a Comtist and a member of the Royal Commission of 1867, captured some of the frustrations of the time when he complained about those who "even suggest an Act of Parliament to suppress all [union] associations whatever. It is like the Vatican raving at newspapers and railways" (1908, 299). For their part, some unionists were quite fed up with constantly being chided about these supposedly ironclad "laws." While they were rarely direct participants in the debates among the high theorists, reports of their exasperated disdain for the imperious laws were commonplace. As one David Chadwick reported in 1860, he "much regretted to find that some of the leading members of Trades Unions, attempted to deny the existence and operation of the *law* of political economy in regard to Supply and Demand governing the *price* of labour."

We also tend to forget that this antagonism was the context for the composition of Karl Marx's *Capital* in the early 1860s. Marx's first public statement of his theory of wages came in an address before the General Council of the First International Working Men's Association in June 1865, published posthumously as *Value, Price and Profit*. The objects of Marx's scorn on that occasion were figures within the International who had made use of Mill's wages fund doctrines to argue that unions who achieved wage increases merely hurt other segments of the working class. Marx, good Ricardian that he was, felt that he could wave away supply and demand as a mere accessory to a theory of value: "You would be altogether mistaken in fancying that the value of labour or of any other commodity whatever is ultimately fixed by demand and supply. Supply and demand regulate nothing but the temporary *fluctuations* of market prices. They will explain to you why the market price of a commodity rises above or below its *value*, but they can never account for that *value* itself" (1935, 26).[22] Of course his innovation was to deny that "labour" (as opposed to labor power) was a commodity at all.

There is a literature which debates the relative consequence of Thornton and Mill in this agonistic field of labor mobilization and political proselytization of the 1860s and 1870s (Clements 1961; Biagini 1987; Pelling 1963, 63); this is neither the place nor the time to intervene in that debate. Nevertheless, there are two things to note about the immediate aftermath to the publication of *On Labour*. First, after the report of the Royal Commission in 1869, Parliament passed the Trades Unions Act of 1871, the Conspiracy and the Protection of Property Act of 1875, and the Trade Union Amendment Act of 1876, the effect of which was legal acknowledgment of the full legitimacy of trades union organizations. This legitimation placed classical political economy in the awkward situation of condemning as an unnatural abomination a political entity and economic framework which was clearly here to stay, and moreover, one which enjoyed the support of a large proportion of the voting polity as having salutary benefits. This untenable situation could not persist indefinitely. Second, by roughly 1880, conventional wisdom among the literati had performed an about-face, wherefor it became commonplace to deride those supposedly inviolate laws of supply and demand as defunct. Trades unions sympathizers did it: "To-day the old orthodox Economy–the Gospel, or Sophism, of Supply and Demand, absolute freedom for Individual Exertion–all this is ancient history . . . [Socialist unionism] has killed that old Targum about Supply and Demand–the plain English of which was–'May the devil take the weakest!'" (Harrison 1908, 410). But pillars of the establishment, such as presidents of section F of the British Association for the Advancement of Science, also did it: " 'The recognized principles of political economy' or 'the immutable laws of supply and demand' were phrases that occurred as readily to a journalist in the sixties as 'the exploded doctrine of laissez faire' does to the leader writer of today" (in Smyth 1962, 127).

In our view, Thornton's *On Labour* simply brought to a head the contradictions inherent in the classical theory of value and distribution when juxtaposed with the political realities of escalating worker organization across Europe. The effect of these contradictions was to induce a brief and concentrated period of theoretical innovation in political economy unmatched by almost any other period in British history. While much of this innovation would be couched in the language of supply and demand, it is important to acknowledge that in the two decades until 1890 there were several other approaches to resolving the contradictions, and that only in Marshallian retrospect were they all reduced to a single orthodoxy, known by the neologism "neoclassical economics." These alternatives can be arrayed according to their relationship to the prior multiple interpretations of supply and demand outlined above.

To begin, there was the hard-core Ricardian response, best exemplified in Marx's *Capital*. In this narrative supply and demand still played no fundamental role, and the doctrine that lasting wage increases by trades unions were economically possible was reified in the dichotomy between "labor" and "labor power." For Marx, trades unions were not an end in themselves, but merely a necessary way station for a proletariat seeking to usurp political power from the bourgeoisie (Marx 1974). By contrast, the "engineering" group derived from the Whewell orientation assumed the technocratic position that supply and demand constituted the sum total of economic theory applicable to this controversy; yet a suitably disinterested perspective would admit that unions violated no particular "natural" equilibrium, since the interests of capital and labor were naturally antagonistic. This position had its own special piquancy, since it was the British labor aristocracy of engineers who had pioneered the structure of the new model unions. Fleeming Jenkin ventured this interpretation in his article "Trade-Unions: How Far Legitimate?" (1868), written, it should be noted, *before* the more widely known "Graphic Representation of the Laws of Supply and Demand." In the earlier article he wrote that "simple restriction of the extension of trade is not *per se* an evil, and none of the pleas against trade-unions founded upon it will hold water" ([1887] 1931, 33). Combination for the purposes of bargaining could permanently raise wages, but only at a cost to the larger community. "Admitting that total abolition [of unions] is out of the question as impolitic, undeserved and impossible, we must insist that the great power granted to bodies of workmen shall be administered upon stringent regulations" ([1887] 1931, 67). From an Olympian height, unions performed no necessary or logical function; they were simply a fact of existence, rather like the mechanical imperfections of steel beams or chemical imperfections of copper wire which every engineer had to take into account (Smith and Wise 1989, chapters 19–20). Supply and demand theory could incorporate unions just as well as any other relevant structural parameter–once supply and demand were adequately formalized, an unfortunate detail awaiting rectification.

If these two positions constitute the polar extremes of approaches to supply and demand, it was the great muddled middle–the forced alliance of the classical and demand and supply perspectives–which dominated the controversy. It may seem odd to lump together such figures as J. E. Cairnes and W. S. Jevons in this group, but their similarities do tend to overcome their standard distinctions: Cairnes as the last orthodox champion of British classicism, Jevons as the parvenu herald of the nascent neoclassical position. The reason the two belong together is that they both wished to have their cake and eat it too: they strove to preserve something very like the wages fund story, but also insist that wages were natural phenomena set by supply and demand; they wanted to accord a certain grudging legitimacy to trades unions, and allow that they had effectively raised wages, but insist that this legitimacy and efficacy had nothing to do with economic laws, which were still being violated and besmirched by the existence of unions; they felt that Thornton was onto something in focusing on the structure of the bargaining situation and previous inadequacies in demand theory, but that when all was adequately explained it would be seen that Thornton had exaggerated some minor special cases way out of proportion. For both, their dicta concerning supply and demand and trades unions ended up being a terrible hotchpotch, distinguished primarily by their desire to upbraid and discipline the reprobate Thornton.[23]

We shall merely indicate what a vertiginous experience it must have been for a stalwart trades unionist to read the prognostications of the sober representatives of political economy in the 1870s and 1880s. After denying that the content of political economy sufficiently underpins the prescription of *laissez faire* (1871), Cairnes proceeded to assert that “there is a law of market price, as there is a law of normal price, as there is a law of wages, of profit, of rent, as there are laws of the winds and tides and seasons, and of the phenomena of external nature” (1874, 98). Although no sane economist is thought to ever have fully believed in the doctrine of the wages fund (182), trades unions were nonetheless deemed utterly incapable of enlarging the wages fund (218). Finally, “combination, whether employed by capitalists or by labourers, may succeed in controlling for a time the price of labour, is utterly powerless in the hands of either, to effect a permanent alteration in the market rate of wages as determined by supply and demand” (235). Likewise, for Jevons the wages fund was transparently false, and “Practically, the whole question resolves itself into a complex case of the laws of supply and demand” ([1882] 1894, 95). However, when Jevons got down to the task of specifying the details of his price theory, an explicit description of these laws of supply and demand was notable predominantly by its absence (White 1989c; 2003). As for unions, they were a curse and a fraud, since “whosoever tries to raise his own wages. . . attempts to levy contributions from other people. It is simply a case of private taxation” (1894, 106). Contrary to all contemporary belief, “the supposed conflict of labour with capital is a delusion. The real conflict is between producers and consumers” (101). Nevertheless, “Even when we can clearly perceive that the action of a “corner” or trade union is pernicious, it does not necessary follow that the State would do well to intervene. In some cases evils are best left to work their own remedy” (32). In a bizarre variant on Marx, Jevons seems to have believed that union organization would simply degenerate and wither away (129). Mill’s belief in the civilizing effects of union organization upon the workers was derided as just so much rank ignorance of the teachings of science. “Human nature is one of the last things which can be called ‘pliable.’ Granite rocks may be more easily moulded than the poor savages which hide among them” (Jevons 1890, 290).

The 1860s and 1870s were the silly season of the political economy of British labor, marked by hysterical denial of obvious political realities and a shortage of logical analysis; observers avoided discussing actual unions and their actual functions, regarding them either as little better than abstract spanners in the clockwork market or, alternatively, as concrete embodiments of Christian charity. Purblindness had as much to do with the diminished reputation of political economy in Britain as did its dreaded dismalness. An appreciation of this fact will help to explain why it was Thornton’s *On Labour* which came for many of his contemporaries to represent the locus of calm, dispassionate economic analysis of unions; the central tendency of political realism; the Golden Mean among rival value theories, incommensurate pretensions to scientific status, diverse attitudes toward empiricism, and lurking threats of socialism. Thornton’s book garnered the attention it did because it appeared to occupy the elusive center: that is, at least until Marshall’s *Principles* burst upon the scene.

Perhaps now we possess some inkling of the context in which John Hicks’s heroes–Jenkin, Marshall, Edgeworth, Pigou–were all so very exercised to repeatedly address the problem of the “indeterminacy of wages” and the “correct” understanding of demand and supply. Their convergence upon this issue was no mere coincidence.

What Did Thornton Do?

As broached above, Thornton's dominant purpose in writing *On Labour*was to elaborate upon Mill's mature position that wages were the product of intentional activity and bargaining, that unions leveled the field in this respect for workers, and that far from hobbling the operation of a free market, they offered a fine example of the means by which the evolution of markets encouraged civilized improvement over time. Where Thornton departed from Mill is that he regarded the doctrine of supply and demand as hopelessly confused, and worse, a major hindrance to the prosecution of Mill's political brief in favor of the legitimacy of trades unions. Thornton's contemporaries certainly found this his most compelling and contentious theme, for although it accounted for a very small proportion of the text in the first edition–basically chapter 1 of book II–it drew more criticism and commentary than the rest of the text combined. Having hit this obviously exposed nerve, Thornton responded by doubling the length of the chapter in his second edition.[24] For long afterward, Thornton's overarching position regarding the virtues and vices of unions was neglected in favor of his strictures regarding supply and demand. To avoid repeating this habit, let us first survey the architecture of the volume, and then return to the problem of supply and demand in greater detail.

The first book of *On Labour* is concerned to argue that because of a flawed theory of pricing, political economists had misapprehended the fundamental function of trades unions. Labor was appreciably different from any other commodity because–under the rules of bargaining and closure specific to British practice–it was offered unreservedly in the market, whereas other commodities were not. If shoes went unsold, or if buyers made unsatisfactory bids, the shoes could be put aside by the seller for another day. If the commodity was perishable, like fish, special kinds of auctions could be arranged to move the product with dispatch and thus address the bargaining imbalance. But labor by its very nature could not be reserved–labor unsold simply evaporates, never again to be put on the market. Because of this, and because it is predominantly the poor who labor and the rich who provide capital, the purveyors of labor find it difficult to use the most important device available to all other participants in the marketplace for higgling the terms of trade in their own favor. Note well, this is a structural regularity which leads to a procedural asymmetry: it is not a complaint about injustice, nor is it an argument about a state of ideal equality. Moreover, owing to the class interests of the buyers of labor, there were no special market institutions to redress the imbalance. Without some form of concerted intervention, this asymmetry between buyers and sellers would persist indefinitely. The economic functions of trades unions were primarily two: to restore symmetry to the commodity labor by allowing labor to be reserved in effect (if not in fact) when buyers made unsatisfactory bids; and to elevate labor to a plane of bargaining equality with the more powerful and already locally coordinated body of employers.

There were a number of minor additional functions which trades unions might also perform, although Thornton was rather less sanguine about their abilities to do so: unions might administer pensions, disability insurance, and strike funds; they might actively seek to alter the market institutions and practices which coordinated the pricing of labor (after the style of the fish merchants); they might help legislate the conditions of work on the shop floor and arbitrate individual disputes between masters and men; they just might help bring about self-improvement through the encouragement of education and the bracing experience of self-government and self-reliance. But Thornton was not some starry-eyed apologist for unions; his contemporaries recognized this as one of his chief virtues. For instance, he opined that most of the latter auxiliary functions might be better performed by the state. He allowed that unions were often corrupt; that the costs of union organization might be burdensome to those within and without the union; that strikes often hurt the workers concerned more than they helped, at least in the short run; that they might throw up obstacles to the mobility of resources. Unions, in his view, were a "necessary evil," at best an intermediate expedient on the road to some better future form of work organization. Indeed, "the great object of this treatise is to show, that whatever unionism may be able to do for working men, industrial co-operation can do still more" (*302–3). In this regard Thornton was not so very different from Mill, Cairnes, and many of his contemporaries, who placed their millenarian faith in cooperatives, profit sharing, and some vague form of industrial democracy to address the larger questions surrounding the future of the troubled adversarial relationship between labor and capital.[25]

The most striking novelty to be found in Thornton's work is that whereas he openly accepted the principle of universal selfishness as the starting point for analysis, he abjured all appeals to "Nature" and "natural law" to ground his theory. The ambition of constructing a natural science of society was a chimera for Thornton. He applied this belief evenhandedly to his patron and friend Mill, to the old-fashioned detractors of unions, and to the socialists. It begins, of course, with the theory of price, but it does not stop there. To the political economists he throws down the gauntlet: "Price is scarcely ever mentioned without provoking a reference to the 'inexorable,' the 'immutable,' the 'eternal' laws by which it is governed; the laws which, according to my friend Professor Fawcett, are 'as certain in their operation as those which control physical nature.' It is no small gain to have discovered that no such despotic laws do or can exist; that, inasmuch as the sole function of scientific law is to predict the invariable recurrence of the same effects from the same causes, and as there can be no invariability where–as in the case of price–one of the most efficient causes is that ever-changing chameleon, human character or disposition, price cannot possibly be subject to law" (*82).

Yet the socialists were warned they also must take their medicine unsugared. There are no abstract principles upon which workers might base their claims for improvement, Thornton warned. No one has a right to a job, or a "living wage," or claims upon the means of production, or "original rights" to the fruits of his labor, or realization of his God-given potential for happiness. John Locke and David Hume were painted as part of the problem, not part of the solution. There is nothing "natural" which serves to allocate "responsibility" to labor and capital: "Your employer's profits are not the product of your labour in any sense in which your wages are not equally the product of his capital."[26] There exist no principles of justice which insist that employers not combine against the interests of their workers, said Thornton; they owe no economic obligation to society for having been born with the proverbial silver spoon. Thornton was a theorist of the symmetry imposed upon market process, not of equality of status or opportunity or of original position in the manner of Rawls. To Mill's discomfort, he became an anti-Millian; but it has escaped attention that he also was an anti-Marxist before the fact.

It is interesting to speculate on the extent to which Thornton can be read in retrospect as a representative of a "Darwinian" approach to political economy antithetical to that innovated by Herbert Spencer and others. Thornton certainly devoted more than passing consideration to the arguments for and against Darwinian evolution.[27] Whereas Spencer was the theorist of a *telos* of development, a Victorian scientism which sought to reduce utilitarianism to a few physical laws, Thornton was the prophet of irreducible diversity of human ingenuity: of market forms, of legal forms of property, of human motives, of economic outcomes. In this, he felt he was seconding Mill's opinion that there existed different categories of markets (in Mill's case, wholesale versus retail) which would in principle require differing explanatory strategies. Thornton described a world where structures cobbled together initially to meet one purpose might end up subserving another one, entirely unforeseen. He privileged competition as a causal principle, but warned that the outcome is never unique. "There is never any such 'stable equilibrium' as that of which the teachers of political economy dream" (*48n). Spencer regarded man as a machine, a conceit which underwrites the ambitions of a unified science of man; whereas Thornton regarded this to be a delusion prevalent among those who aimed to turn Darwinism into just another version of Cartesian philosophy: "Professor Huxley... goes on to avow his belief that the human body, like every other living body, is a machine, all the operations of which will sooner or later be explained by physical principles, insomuch as we shall eventually arrive at a mechanical equivalent of consciousness, even as we have already arrived at a mechanical equivalent of heat" (1873b, 169). This, perhaps to a greater degree than any other consideration, explains why Thornton was impervious to the charms of the new model mechanical version of utilitarianism which was being taken up by Jevons, Edgeworth (Mirowski, ed., 1994a), and the younger Marshall (1994).

Indeed, the dispute over supply and demand and the legitimacy of trades unions was to a notable extent reinforced by and overlapped the controversy over the meaning of Darwinism. Here we refer not to any simplistic and erroneous equation of the ideology of rapacious capitalism with "social Darwinism" (Bowler 1988, 156–65), but rather the more specific point that the major players in the union controversy were understood to also have substantial intellectual stakes in interpreting theories of evolution. Herbert Spencer of course popularized the term "evolution" as a biological analogue to utilitarian self-improvement, giving it a very Lamarckian cast (Bowler, 1988, 39–40). Fleeming Jenkin is well known in the literature of the history of biology as an early critic of Darwinian selection.[28] Cairnes sought to explain Thornton's attack on what he considered the "demand" side of orthodox explanations of the wage by positing that the “supply” side, by which he meant the population principle, had been situated beyond the pale of dispute by Darwin: Malthus’s theory “has of late been powerfully helped forward by the influence of Mr. Darwin’s work, in which the obnoxious principle... was shown to be merely a particular instance of a law pervading all organic existence” (1874, 157). Jevons believed that one of Mill’s most grievous faults was that “the whole tone of Mill’s moral and political writings is totally opposed to the teaching of Darwin and Spencer ... He might be defined as the last great philosophic writer conspicuous for his ignorance of the principles of evolution” (1890, 290, 289). One would surmise that Thornton’s somewhat similar anti-Spencerian stance would have equally earned his contempt. Alfred Marshall, notoriously, sought to relocate the mecca of the economist into biology, but what this meant in practice was a warmed-over Spencerianism (Groenewegen 1995, 167); for instance, he proved unable to grasp the significance of Weissman’s disconfirmation of the inheritance of acquired characters (484).

Whatever Thornton’s exact relationship to Victorian biology, he did make one statement of principle in the second edition of *On Labour* which earned him the obloquy of future generations, as well as loss of some measure of Mill’s favor. In Mill’s famous review essay of Thornton’s book in the *Fortnightly of May* and June 1869, he took exception to Thornton’s attack on the theory of supply and demand, insisting that if one conceded special cases in which the analysis did not apply (as Mill had repeatedly done previously), then Thornton’s strictures should only have counseled amendment, not fullscale repudiation. Inexplicably, Thornton, an intemperate debater at the best of times, felt impelled to strike back, adding the following passage to the second edition: “a scientific law admits of no exception whatever, one single exception sufficing completely as a thousand to deprive it of all legal character. If one single instance could be found, or conceived, in which water failed to seek its own level, that water seeks its own level would cease to be a scientific law” *(*67)*. It is incomprehensible that any reader of Mill’s *Logic*, which contains an elaborate defense of tendency laws, and a proviso of their special application to political economy, should have made such a bald statement and hoped to get away with it. Whatever prompted Thornton to make such a rash and fundamentally false statement, it certainly gave welcome hostage to the clutch of younger economists eager to reprimand the older generation on its weak understanding of the nature of science, and diverted the controversy back in a direction that Thornton had originally tried to avoid.

Thus the real significance of Thornton’s masterpiece lies in his attempt to rid political economy of its unhealthy dependence upon natural law, and yet simultaneously produce a theoretically grounded economics that could make strong and controversial policy prescriptions about one of the most politically charged issues of the day. In that light, contemporaries were correct to focus their attentions upon book II, chapter 1, which serves as the pivot of this argument. Since everyone from Jenkin to Negishi to Ekelund who sets out to indict Thornton of various “confusions” begins by denying this very first premise, it is important to register his rhetorical question: “what is it that determines price? Assuredly neither inherent utility nor cost of production has the smallest effect on it” (*136). In the question of isolating the causes of realized price, “Our best chance of finding this out is by considering carefully all that happens when a sale takes place” (*76). To that end, Thornton proposes a series of examples of specific markets: Dutch versus English auctions for herring (56); two horse fairs with face-to-face negotiations (59); a shopkeeper selling gloves at various posted prices (64). The point of each of these differing bargaining situations is to suggest that a generic law of supply and demand cannot adequately explain how it could be that under essentially the same circumstances, with the “same” goods and the “same” transactors, realized prices *may* turn out to be different, depending upon the sequence of bargaining and the nature of the closing rules. Some imprecision does haunt the discussion, given that Thornton both challenges Mill’s “definitions” of supply and demand and then posits in his examples that “demand” is greater or less than “supply” for purposes of exposition.

What provokes later readers more than anything else to accuse Thornton of inconsistency and muddle is his denials that the laws of supply and demand exist, juxtaposed with his use of the terminology of supply and demand to discuss specific cases. Therefore, it behooves us to clarify what Thornton believed about price theory. First, when engaging with other theorists, but mainly Mill, Thornton tries to use their conceptions of supply and demand to demonstrate that standard conclusions need not be drawn from their premises. This is the rhetorical device of temporarily entertaining your opponents’ premises and respecting their preferred terminology. Secondly, and beyond this first device, Thornton reluctantly sanctions the use of the terminology of supply and demand to refer to specific quantities of goods formally offered in a well-defined spot market, and explicit bids tendered in the same market. However, in Thornton's view *these quantities do not regulate price*. This is because in most well-organized markets–and, following Mill, this probably excludes most retail markets–dealers continually privately harbor estimates of magnitudes of bids or quantities which might be tendered in the near but nonspecific future. Because all markets exhibit the phenomenon of "reservation" to a greater or lesser extent, the relationship between flow bids and asks on the one hand and order backlogs and inventories on the other is inescapable. All actual behavior is predicated upon these beliefs, which Thornton calls "prospective demand and supply." However, there is no fixed mathematical relationship between the solid quantities which appear in a spot market and the psychological estimates which constitute prospective supply and demand. "The competition which [a dealer] apprehends is that of a variety of men anxious to sell, or believing themselves under the necessity of selling, very different proportions of their actual stocks, and that within very different periods of time–a competition of men of every gradation of experience, shrewdness, and neediness; who, in the first place, estimate the future probabilities of the market for very different periods; in the second, would form very different estimates, even for the same period; and in the third, would be influenced very differently by the same estimate. Surely such competition can in no intelligible sense be said to *depend* upon prospective supply and demand" (*80). The irreducible diversity of the participants, as made manifest in their widely divergent linkage of observable quantities to their own private expectations and their resulting behavior of reserving some portion of their stocks from immediate bid or offer, prevents "supply and demand" from dictating a single outcome as to price and quantity in any given market.

This constitutes the core of Thornton's theory of price. "Plainly, then, it is competition, and competition alone, that regulates price; but what regulates competition? ... if by regulating be meant the laying down of rules or prescribing a course which competition in any given circumstances must follow, the simple answer is Nothing. There is no regularity about competition–competition is not regulated at all" (*79–80). Was this nihilism, or the abdication of all pretense to scientific explanation, as modern commentators moan? No indeed, although it must be said that at this exact juncture Thornton leaves off his analysis of commodities in general to concentrate his attention upon labor, thus abandoning the analysis just where he ought to have driven it home. From the remainder of the book, it might be easy to extrapolate that Thornton was left paralyzed, unable to propose anything further about the nature of competition and its bounding of realized price. But if that had been the case, then nothing he said about the effects of unions would have been predicated on what had gone before. Instead, the next obvious thesis concerning price theory for Thornton was that although competition was not regulated by any natural laws of psychology or cost, competition could be hemmed in and regulated by the specific market structures which came over time to be associated with particular commodities in certain cultural settings. Patently, if trades unions could raise wages, then something about the market had been altered to regulate competition.

It was only in the late twentieth century that each of Thornton's theses on price theory was vindicated, ironically enough through the prosecution of a research tradition which was initially generated to reprimand Thornton for his heresy. Although this is not the place to make the case in detail, we can briefly indicate how the argument would run. First, utilitarian psychology has been proven incapable of underwriting deterministic laws of supply and demand. This is the lesson of the Sonnenschein-Mantel-Debreu proofs of the indeterminacy of excess demand functions in a full system of neoclassical general equilibrium.[29] The point can be made in a much less technical fashion: if Walrasian general equilibrium cannot guarantee uniqueness and stability of equilibrium except under wildly unrealistic circumstances, then even with a supposedly generic market mechanism, these economic "laws" don't operate in general the way their neoclassical advocates suggest. Thornton said that supply and demand do not lead to unique pairs of price and quantity; and so does Hugo Sonnenschein. Second, a generation of research on decision theory has produced one very pronounced empirical generalization: people don't generally conform to the so-called laws of probability in their formation of expectations. The utter bankruptcy of the Bayesian tradition in finding itself asserting that everyone must form identical probability assignments to be "rational" only reveals the fundamental soundness of Thornton's insistence upon the irreducible diversity of traders' cognitive capacities and economic expectations. Third, suppose for the moment that we abandon the pure modern neoclassical approach, but instead preserve the idea that there still exists some kind of function relating demand price to quantity demanded of some suitable aggregation of market traders. Even in this relatively unprepossessing case, Thornton was still correct in asserting that the "equation" of a supply and a demand function will not itself determine price. Since this last point may be unfamiliar to most economists, it may be worthwhile to sketch the argument in some detail.

The postwar rise of "experimental economics" has had a salutary effect on the community of economic theorists by driving home two points: first, that individuals do not conform to the neoclassical characterization of rational choice in controlled laboratory circumstances; second, that the form of market institutions matters, and while some kinds of structures (primarily double-sided auctions) conform to neoclassical predicted price and quantity equilibria when costs and reservation prices (that is, preset supply and demand curves) are given exogenously, other alternative sorts of market structures do not (Holt in Kagel and Roth 1995, 371 et seq.). For some economists, such as Vernon Smith, this second observation suggests that the profession should seek solace in something he calls the "Hayek hypothesis": namely, that markets somehow "work" independently of the cognitive states of the agents (1991, 221 et seq.). For Smith the Marshallian, "working" means converging to the equilibrium identified by the pre-given supply and demand curves; he neglects to consider that success is restricted to a small subset of possible market formations. The situation has been better clarified by the recent papers of Gode and Sunder (1993, 1997), wherein it is demonstrated that *it is the market rules alone* which explain eventual convergence or nonconvergence to equilibrium pre-identified by supply-and-demand price and quantity pairs, since this convergence will happen even with brainless automata making random bids and asks in the environment most favorable to the neoclassical model (that is, the double-auction market). In other words, if for the sake of argument stable Marshallian curves are presumed to exist a priori, then any predictable regularities are attributable solely to the form of institutional market rules: auction setup, closing rules, bid-improvement rules, the ability to withdraw posted offers, the enforcement of budget constraints. *Markets are not an expression of individual rationality*. In general, price and quantity pairs for the same good in the same market fall within a probabilistic range rather than collapse to a single point, unless this condition is itself imposed by some sort of clearinghouse mechanism. Among other interesting corollaries, in most cases the supposed "law of one price" fails to hold even within a single market period, if recontracting is disallowed. All of this can be found in Thornton's writing of more than a century ago.

We might venture further to suggest that there is no longer any good reason, other than irrational, sentimental attachment to a hallowed analytical tradition (which has recently, rather inconveniently, been cut adrift from its moorings in utilitarianism), to believe that platonic supply and demand curves really do exist, somehow independent of the contingencies of time, chance, and price distributions transmitted from other, similarly constituted markets. One cannot have it both ways: lawlike functions predicated upon individual free choice, and the unfettered interdependence of markets. This chapter reveals that those curves are cultural vestiges of the nineteenth century, a period when hard sciences like physics were thought to uncover rock-solid deterministic functions which could be readily subjected to the differential calculus for purposes of manipulation and control. This too can be gleaned from Thornton.

Thus ends the case for entertaining Thornton as a serious economic thinker, one that differs from those previously made in his favor. Thornton was not a partisan of hysteresis phenomena, nor was he Brian Arthur without the urn model. The problem faced by these and other authors who seek to recast Thornton's claims in more modern language is that the neoclassical framework is not only awkward, but thoroughly antithetical to the ideas Thornton was striving to express. This incompatibility is no accident, given that much of the Marshallian variant of the neoclassical program was generated expressly for the purpose of denying the cogency and legitimacy of Thornton's claims. In the language required to capture Thornton's intentions, the portrait of active agents and passive economic environments consisting of generic markets undergoes a gestalt reversal: one must envision a multiplicity of market institutions, which had generations of experience with the eccentricities of particular commodities and cultures, hemming in the output of price and quantity pairs through their individual operations and therefore accounting for much of the predictability of the essentially random actions of the economic agents. This is the format of economic theory endorsed in chapter 1.

The observation that modern economics obstructs hermeneutic understanding extends to the one neoclassical economist who has accorded Thornton the benefit of serious and close reading, Takashi Negishi (1986). He correctly points out that the attempt to subsume Thornton as a special case of supply and demand where the two curves coincide for some portion of their range, begun by Jenkin in 1870 after a reading of Mill's review of the preceding year, is fundamentally incorrect, and was rejected by Thornton himself in the second edition of *On Labour*. However, he then proceeds to interpret Thornton as discussing a situation of "disequilibrium," one perhaps due to a situation of imperfect competition. This interpretation is easily countered with a quote from *On Labour:* "There is never any such stable equilibrium as that of which the teachers of political economy dream" (*48n). Thornton did not believe the proposition that an equilibrium of supply and demand really existed, but was thwarted by some unfortunate "false trading" before the fact: rather, he thought supply and demand curves were an unfortunate figment of the imaginations of political economists, which could be disproved by temporarily entertaining their premises and showing that they could not withstand the consideration of actual behaviors observed in the marketplace. Negishi's insistence upon the former reading is all the more puzzling because in a footnote he reveals that he is aware of the correct alternative reading: "Thornton's point is not so much that different institutions (bid forms) generate different prices as that under some institutional condition the price is not determined by the equality of demand and supply" (1986, 572n). Our only explanation of this puzzle is that Negishi shares with the rest of the neoclassical profession the deep conviction that if all markets don't operate in a generic fashion, subject to a single set of laws, all hope of a science of economics is lost. In an era dominated by physics this belief would be more plausible than in an era dominated by biology.

The practice of Thornton exegesis has since been driven to bedlam, primarily by the strident efforts of Robert Ekelund. First, Ekelund took Negishi to task for imposing a Walrasian framework upon Thornton; but he then proceeded to ignore the textual evidence and loudly proclaim that no sympathetic reading of Thornton was conceivable. For instance, given the evidence presented in this volume, it is unconscionable to argue that there is "no textual evidence that Thornton ever understood Mill's simple but serviceable theory" (Ekelund and Thommesen 1989, 577). Thornton would have been truly offended at being accused of being a Comtist (57m); and no contemporary British political economist in good standing, one suspects, would have maintained that he "demonstrated little or no knowledge of supply and demand theory." Ekelund's attempt to recast the whole issue in terms of Vickrey's model of auctions (1961) is a solecism which far exceeds any residual Whiggism which Negishi might have displayed, if only because Thornton explicitly denied that traders could carry out the probabilistic calculations required in Vickrey's model; and in any event, Thornton also explicitly rejected utility as an explanatory concept. Ekelund's accusation that Thornton did not grasp the difference between a theory and an application presumes that there exists a canonical handbook of Economic Method with which he should have been familiar. This last accusation is particularly anachronistic, since the very *genre* of handbooks of economic methodology in English were jump-started by those who were recoiling from the controversy which Mill and Thornton precipitated (Blaug 1992, chapter 3). Cairnes's *Logical Method of Political Economy* (1875) and John Neville Keynes's *Scope and Method of Political Economy* cannot be understood without understanding the backdrop of controversy swirling around Thornton. Keynes himself innovated the standard modern response to Thornton: if you know enough mathematics, then all critique can be deflected into "technical" issues: "Amongst the characteristic direct advantages of mathematical analysis and diagrammatic representation is the fact that the significance of *continuity* in the variations of phenomena is brought into prominence. This remark applies pre-eminently to the diagrammatic treatment of the law of supply and demand. Such a treatment affords, for example, the simplest means of dealing with the ingenious criticisms to which Mr. Thornton has subjected this law. He adduces cases which at first sight look like exceptions overturning this law altogether; but the method of diagrams at once shews them to be extreme or limiting cases due to a break in the continuity either of demand and supply. They are accounted for, and their true signification easily apprehended" (1917, 262). Once again, we might suggest that the mere escalation of mathematical formalism is no *prima facie* evidence of progress in economics (Niehans 1990), but rather simply one technique among many to recast, reconceptualize, and co-opt intellectual criticism; and if all else fails, to misrepresent and ignore it altogether. Perhaps this explains why Ekelund remains incapable of addressing any of the above reconsiderations of the actual theoretical arguments of William Thomas Thornton on his own terms, resorting in desperation to ever-more fervid recitations of the catechism.[30]

The real problem which Thornton the historical figure presents to modern economists is this: To what extent must they acknowledge the legitimacy of a tradition whose explanatory principles violate every basic presupposition of their own hallowed tradition? The question parallels one that they pose concerning the economic agent: To what extent must the economist simply tell the agent what the economist believes the agent is doing, and how far can the economist credit the agent with holding a legitimate account of the causes of his or her own activity?