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Special Issue on
Global Inequality
PART II
edited by
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AND
MICHELLE BATA

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Special Issue on Global Inequality – Part II

EDITED BY ALBERT J. BERGESEN AND MICHELLE BATA

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The main editorial goal of the *Journal of World-Systems Research* is to develop and disseminate scholarly research on topics that are relevant to the analysis of world-systems. We especially want to include works that proceed from several different theoretical stances and disciplines. These include, but are not limited to, civilizationists, evolutionary approaches, international political economy, comparative, historical and cultural analysis. We seek the work of political scientists, historians, sociologists, ethnographers, archaeologists, economists and geographers.

We especially encourage works that take theory seriously by confronting problems of conceptualization and making definitions of concepts explicit, by formulating hypotheses, constructing axiomatic theories and causal models. Theoretical research programs that combine theory construction with comparative research are badly needed to take the world-systems approach beyond the stage of a perspective.

We also want to encourage the application of comparative, quantitative and network-analytic methods to world-systems research, though we will certainly also publish pieces that do not use these methods. Any empirical study that is deemed relevant to world-systems analysis may be published even if it uses a very different conceptual framework.

And finally we also want to publish discussions of future trajectories and options for the modern world-system and considerations of what can be done to create a more humane, peaceful and just world society.

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Michelle Bata
Albert J. Bergesen



This is Part II of the special issue on global inequality. The articles in this issue extend some of the theoretical issues raised in the first issue. By focusing on specific regions and comparing the development of global inequalities in the nineteenth and twentieth centuries the articles in this issue suggest new directions in global inequality research.

In the first article, “Critiques of World-Systems Analysis and Alternatives: Unequal Exchange and Three Forms of Class and Struggle in the Japan–US Silk Network, 1980–1890,” author Elson Boles offers a critique of more recent world-system analyses. His complaint is that such analyses rely too heavily on macrostructural abstraction instead of giving weight to the “total history” of interstate relationships. As such, by examining the Japan–US silk network, he endeavors to focus not on the particulars of how modern capitalism might shape that network, but instead concentrates on historical method, theory, and conceptualizations.

Boles begins by noting that the form of the Japan–US network during 1854–1886 was integral to the incorporation of Japan into the modern world-system. Japan’s incorporation was critical because it allowed for the creation of a global division of labor as it pertained to the silk network. He then develops an incorporated comparisons method in order to reconstruct the relationships between the agencies, labor forms, and social relationships involved in the Japan–US network. He finds that interstate disparities of the network arose through the interconnections among distinct capital-labor relationships. Specifically, Boles

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concludes that the integration of specific forms of production and class relationships via interstate markets decisively structured the uneven market pressures on commodity prices and on production relationships. Thus, unequal exchange in the Japan–US silk network was sustained on the basis of the social conditions of production.

The next article by John Talbot offers another view of the unequal exchange in the world-system. In “Information, Finance, and the New International Inequality: The Case of Coffee,” Talbot argues that a “new” international inequality exists that has been superimposed on the “old” form of international inequality, and that this superimposition helps explain increasing global inequality. Based on Arrighi’s (1994) concept of the four systemic cycles of accumulation, Talbot conceptualizes the old and new forms of inequality as they are linked to the rise and fall of global hegemony. For instance, the old form of international inequality was established during the British cycle, which was significant because that cycle drew the world into a single market based on a singular global division of labor, which relied on the control of production processes and the flow of goods. On the other hand, the new form of international inequality emerged during the crisis of the US regime in the 1970s, and was based on the control of capital and the flow of goods. Using the world coffee market during the period of US financial expansion since 1970, he compares the events in the coffee industry following two severe frosts in Brazil that disrupted the market. His argument is that the combination of the old and new forms of inequality disadvantages coffee producers in peripheral and semiperipheral nations such that core-based transnational corporations (TNCs) were able to gain control of production through their control over financial capital. He concludes that the way in which TNCs dealt with the shock of the frosts in Brazil illustrates how new international inequality functions, and further highlights the ramifications of superimposing the new form on the old form of inequality.

Next, Bruce Podobnik adds to the debate concerning increasing global inequality in his article titled “Global Energy Inequalities: Exploring the Long-Term Implications.” He opens his article by claiming that insufficient attention has been paid to the unequal levels of energy consumption in the world-system. This inattention is problematic because unequal levels of energy consumption can lead to environmental and human challenges, as well as increase the potential for resource-based geopolitical conflicts. He contends that energy-related difficulties will eventually undermine stability in the world. By highlighting the fact that many people in the developing world struggle to access modern energy technologies while people in more developed regions consume energy resources at an unsustainable rate, he illustrates how the expanding capitalist world-economy intensifies processes of environmental degradation.

The final article is Andre Gunder Frank’s review essay of the book *Globalization and History: the Evolution of a Nineteenth Century Atlantic Economy* by Kevin O’Rourke and Jeffrey Williamson. Frank critically evaluates the authors’ central question: “whether the Atlantic economy experienced convergence of income among its constituent parts.” His world-systemic answer is that this question cannot be answered without considering the broader web of economic relations in which the Atlantic Economy was embedded. In making this point Frank also begins to outline a different way to conceive of global inequality in the world economy in terms of a “world-wide multilateral system of balances and imbalances of trade and payments.” It is a most provocative discussion with rich implications for how the distinctly international aspects of global inequality should be conceptualized.



ABSTRACT

Sympathetic critics of world-system analysis contend that its systemic level of abstraction results in one-sided generalizations of systemic change. Unequal exchange theory and commodity chain analysis similarly reduce distinct and historical forms of labor and their interrelationships to common functional and ahistorical essences. This paper applies an incorporated comparisons method to give historical content to an understanding of unequal exchange and global inequality through a study of the Japan-US silk network's formation and change during the mid 1880-1890s. Analysis of unequal exchange processes requires, in this case, an examination of the mutual integration and transformation of distinct labor and value forms—peasant sericulture, filature wage-labor, and industrial silk factory wage-labor—and the infundibular market forces they structured. These relations were decisively conditioned by new landlordism and debt-peonage, class-patriarchy, state mediations, migration, and by peasant and worker struggles against deteriorating conditions. Indeed, the transitional nature of the silk network's formation, which concluded

the Tokugawa system and decisively contributed to Japan's emergence as a nation-state of the capitalist world-economy, was signified by the very last millenarian and quasi-modern peasant uprising in 1884 among indebted sericulturists, the very first recorded factory strikes in 1885-86, by women raw silk reelers in Kōfu, and by strikes among unionizing workers in Paterson, New Jersey, 1885-86 (Boles 1996, 1998). The "local" conditions of each conflict were molded by the interdependence of those conditions that constituted a formative part of the world-system and its development. In the face of struggles and intensifying world-market competition, Japanese and US manufacturers took opposite spatial strategies of regional expansion to overcome the structural constraints of existing labor forms and relations. Analysis of the silk network permits the interconnections among seemingly disparate events and forms of collective protest within historical networks to be understood, revealing the world-historical dimensions of local developments and, conversely, the local faces of global inequality.

CRITIQUES OF WORLD-SYSTEMS ANALYSIS AND ALTERNATIVES: UNEQUAL EXCHANGE AND THREE FORMS OF CLASS STRUGGLE IN THE JAPAN-US SILK NETWORK, 1880-1890

Elson E. Boles

INTRODUCTION: CRITIQUES OF WORLD-SYSTEMS ANALYSIS

World-Systems progenitor Immanuel Wallerstein is among the acclaimed social scientists of the 20th century, having initially developed an enormously simplifying yet complex analysis of capitalism as a historical social system as expounded in a multi-volume set of sophisticated historical works and in collections of essays that abound with insights (Wallerstein 1974, 1979, 1984, 1989, 1991, 1996, 1998, 1999, 2000). In this great leap forward in the study of the development of underdevelopment, Wallerstein applied Braudel's conception of a world-economy, developed from a rich historical study of the Mediterranean, to the formation in the long sixteenth century of an axial division of labor politically structured by an interstate system centered on Europe. Integrating analyses of long-run large-scale cycles, structures, and trends of capitalism as a historical system, Wallerstein rewrote modern history from a structural perspective and turned upside down the received wisdom in sociology, political science, and economics, both on the left and right, which views states as independent units of analysis, each traversing its own path toward modernity and civilization. Since then, Wallerstein has continued to lead the world-systems school to impressive achievements, not least of which is locating the failures of these modernization and Enlightenment assumptions in the very institutions and structures

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of knowledge—the geoculture—of the modern world-system. Meanwhile, the world-systems literature became increasingly diverse and enriched, as discussed in overviews by William Martin (1994), Peter Grimes (1996), and Thomas Hall (1996), for example. The literature includes new avenues of research, comparative world-systems analysis, case studies, and a number of critiques old and new.

Synopses of world-systems analyses, however, overlook some of the more sophisticated critiques of world-systems analysis, including those by scholars who, besides Frank and Gills (1996), are sympathetic to or have been involved in the world-systems project. Among these scholars are several whose works seek to unify anthropological, social, and world historical perspectives (see McMichael 1990, 1991, 2000; Mintz 1977, 1978, 1985, 1991; Roseberry 1989, 1991; Tomich 1990, 1991, 1997; Wolf 1982). They have consistently expressed dissatisfaction with the world-systemic level of generalization that has come to characterize major works of the world-systems perspective. While there is common agreement that modern capitalism is a historically specific “system,” these critics find world-systems works that begin and end at the grandest level of generalization of social systems possible to be problematic and constraining from several angles. I will refer primarily to Tomich’s criticisms because his are the most trenchant. I shall review and extend the thrust of this critique and alternative approaches to unequal exchange theory and commodity chain analysis. The body of this paper offers a study of the Japan–US silk network as an example of an alternative approach, but one that does not aspire to the same lofty goals as world-systems analysis.

The world-systems perspective has effectively become synonymous with analyses of social systems at the structural level of abstraction. Wallerstein made it clear from the outset that he “was looking to describe the world-system at a certain level of abstraction, that of the evolution of the structures of the whole system” (1974: 8). It is at this level that the “governing” logics which “determine” the largest part of sequential reality” can be found.¹ And perhaps it is only at this level that the very conception and existence of world-systems can be made. But in conflating the “world-system level” of analysis (Hall 2000: 239) with the

¹ World-systems analysis “argues that the optimal method is to pursue analysis within systemic frameworks, long enough in time and large enough in space to contain governing ‘logics’ that ‘determine’ the largest part of sequential reality... This implies then that the task is singular. There is neither historian nor social scientist, but only a historical social scientist who analyzes the general laws of particular social systems and particular sequences through which these systems have gone” (Wallerstein 1991: 244).

analysis of world-systems, the perspective has come to argue that there is no “truly meaningful social change” within the life-history of a system. And so there are no meaningful distinctions among social phenomena beyond the systemic-structural generalizations, categories, or “fields of inquiry.” The point of detailed analysis of local conditions thus becomes one of finding analytical commonalities among diverse phenomena and emphasizing these analytical similarities over their differences. In this way, a variety of historically specific circumstances and forms can be categorized as essentially the same and explained by their function in the structure of world inequality, such as in describing East Europe and New Spain in the long sixteenth century as “periphery.”

For the above mentioned critics, therein lies a big part of the problem: on its own the systemic level of generality is only as accurate as it is general. It is useful and insightful; but alone it cannot capture the history of systemic change. The largest part of sequential reality is not explained, but presumed, and diverse social phenomena are simplified and reduced to functional essences. World-systems analysis is not alone in this regard. As, Tomich argues, both this perspective and the “mode of production” approach represented by Laclau and Brenner begin with,

...a priori models through which the respective historical narratives are reconstructed. Each reconstruction creates a privileged realm of systemic necessity that is at once the source and arena of the ‘laws of motion’ of the system, while relations and processes [differences and distinctions] outside this realm are treated as contingent and secondary. Thus, theory and the history of capitalist development and class formation are collapsed into each other. The privileged concept becomes identical with the ‘real history’ of the system. The complexities of capitalist development are thereby reduced to a single dimension, which comes to define its essences as a historical system. (Tomich 1997: 295).

World-generalization today knows no boundaries, though it is fixated on them. This is why new debates and splits have occurred within the world-system school, including comparative world-systems (Chase-Dunn and Hall 1997) and an ancient world system (without hyphen) (Frank 1998). But if Frank’s assertions of a five thousand year old Eurasian division of labor is based on trade data and other binding criteria that seem disproportionate to the claims of systemic unity and the relatedness of developments, there can be no question that his and other works are based on facts of globe-spanning processes. This suggests, at the very least, that various world-systems may not be adequately explained in terms of their internal “laws of motion.” At some point, a soft boundary is no boundary. And if this is so, then the door has been opened to rethinking and unthinking the timespace boundaries of causality and the very criteria of bindedness (see Stremlein 2001). The idea of states as independent units of analysis has been fully

discredited, and so perhaps now we can consider the possibility that the project of naturalizing systemic causal boundaries and governing logics is itself problematic. Perhaps it is time to reconstruct world historical processes in more open-ended and historically concrete ways that do not a priori exclude the possibility of connections nor assume connections with the idea of systemic boundaries, but embrace historical contingency and complex causality networks—a perspective that favors a “building up” rather than a “filling in,” of categories and totalities. This claim deserves more explanation.

In world-systems analysis, the most general level of abstraction of world-systems—the encompassing categories that express systemic generalizations—has become conflated with total history, despite initial qualifications.² To be sure, Wallerstein theoretically conceptualizes the relation of parts and their positions within the whole in Hegelian terms to underscore the limits of agency.³ But Wallerstein tends to shrug off the kind of criticism made by Tomich and others by effectively misinterpreting it. Against those who think his work isn’t concrete enough, he notes that there are others who complain that his work is too concrete and detailed. If we should not confuse “totality” and “completeness,” neither should we confuse “detail” and “concreteness.” In Wallerstein’s major works structural analysis is treated as directly expressing the largest part of historical reality,⁴ or at least the largest part of it that is said to be “meaningful.” There is then, a two-fold problem. One, structural generalization in fact does not explain the largest part of sequential reality, but represents a generalization about history. The categories of world-systems analysis that many world-system analysts adopt, which are even more characteristic of the unhyphenated “world systems” school, are one-sided expressions of history that do not capture the complexity of diverse processes and events of history. In this approach, truth is said to be in the historical “models.” Two, in this reductionist method, which conflates “theory” and “generalization,” structural categories qua large-scale, long-run gen-

² Wallerstein quotes T. J. G. Locher, “One should not confuse totality with completeness. The whole is more than the sum of the parts, but it is surely also less” (1974: 8).

³ “To put it in Hegelian terms...at every point in the analysis, one asks not what is the formal structure but what is the consequence for both the whole and the parts of maintaining or changing a certain structure at that particular point in time, given the totality of particular positions of that moment in time” (Wallerstein 1979: 54).

⁴ World-systems analysis “argues that the optimal method is to pursue analysis within systemic frameworks, long enough in time and large enough in space to contain governing ‘logics’ that ‘determine’ the largest part of sequential reality” (Wallerstein 1991: 244).

eralizations of historical processes are not built up on the basis of analysis of the historical specificity and diversity of forms, but are derived from logical commonalities among forms that are reduced to common functional essences and in which their interconnections in an axial division of labor are presumed.

In opposition to this method, McMichael (1990, 2000) put forth the “incorporated comparisons” approach. In this approach, totality is not conflated with structural generalizations of an empirical whole, rather, totality is theoretically conceptualized as the unity of many distinct relations and forms and thus generalizations are constructed from the differences among processes that are interconnected. Generalizations gain concreteness when based upon the complexity of differences, and conversely, specificities are more concrete when their general dimensions are revealed. In this view, neither differences nor generalizations are privileged realms of understanding, but are formative dimensions of complex social processes. The reductionist method of world-systems analysis and how it differs from the incorporated comparison approach may be illustrated by contrasting the opposite readings of Marx by these two perspectives. To emphasize the systemic unity of various labor forms Wallerstein stresses Marx’s observation that exploitation of the industrial proletariat and the French and Irish peasants “differs only in form.” He argues that “We all know that for Marx to call something a difference in form means to indicate that this difference is secondary and minor and does not detract from the *essential* similarity of the two phenomena” (Wallerstein 1991:153–154, original italics). It is important to note that Wallerstein’s intention is not really to focus on the analytical (logical) commonalities among labor forms, but to indicate their historical interrelation as elements of a capitalist division of labor. He stresses how these forms of production are variations of exploitation within the same world-economy. In his view, they play certain functional roles in the global structure of inequality in which they are defined by and subjected to common pressures and dynamics of capitalist production and the world market. Therefore, they are not separate “modes of production.” Wallerstein observes that Marx made the same point and refers us to his oft-cited passage: “Without slavery there would be no cotton, without cotton there would be no modern industry. It is industry which has given value to the colonies, it is the colonies which have created world trade, and world trade is the necessary condition for large-scale machine industry.” He also cites this passage: “The character of the process of production from which [commodities] originate is immaterial. They function as commodities in the market, and as commodities they enter into the circuit of industrial capital as well as into the circulation of the surplus-value incorporated in it [industrial capital]” (Wallerstein 1991: 155).

However, if Wallerstein’s point is not to focus on analytical commonalities among labor forms (as opposed to the specificity of the forms and interconnec-

tions) in order to construct structural categories, this is in fact the reductionist method of historical theorizing utilized. As McMichael (1990) argues, the “logic” of class relations and contradictions specific to various forms of labor is reduced to the logic of the form’s functional role in the world-system. Different forms of class relationships that define different forms of labor-capital relationships are reduced to analytical similarities among them across time and space. Slavery, peonage, sharecropping, tenant farming, commodity producing peasantry etc.—are all subordinated to the logical common denominator among them, to a structural-functional essence. In this case, the logical common denominator is their generally similar function in the division of labor as defined by relatively less remuneration of the global “surplus” and their relatively similar degrees of coercion. Classes are thereby defined functionally and they are simultaneously reified as relationships between people and a quantity of “surplus” (a quantity of remuneration). There is no theory of peasant production, or slavery, or wage-labor, etc. and the interrelation among these various labor/class relations—within and between core and periphery—is presumed, not examined in its evolving historical specificity. Consequently, the actual development of the world-system, as the interconnections and development among forms, is unknown. Tomich thus contends that,

In this perspective, what classes have in common takes precedence over what differentiates them...The specific development of distinct forms of social labor and class relations is eliminated as subject matter, as are the historical relationships among these forms...The fundamental categories of class (as well as those of core, semiperiphery, periphery, etc.) are taken as given rather than theoretically reconstructed from the elements that constitute them in specific historical circumstances...Specific forms of class relations and particular local histories are reduced to their [common] positions within a predetermined whole. The result is a historical system without a history, a choreography of events within a static and immutable framework. It is as if the capitalist world economy had existed virtually full-blown from the sixteenth century onward (1997: 296–97).⁵

It is no surprise that Tomich, McMichael, Wolf, Roseberry, and Mintz’s interpretations of Marx’s approach are the opposite of Wallerstein’s and also different

⁵ Wallerstein responds to this kind of criticism in a way that effectively confirms the Tomich’s critique: “It is not that systems are static. Far from it. They have built-in contradictions, and as a result of trying to deal with them, systems manifest secular trends. And over some longer run, the systems consequently move far from equilibrium, and when they do, they can no longer survive as such...The crucial question is to distinguish between the normal, ongoing life of a system and its two moments of transformation: at its beginning and at its end” (Wallerstein 1998: 12).

from the “mode of production” school as represented by Laclau and Brenner. This alternative reading emphasizes the specificities and differences among labor forms as formative elements of an evolving “rich totality” that cannot be reduced to structural commonalities among those elements nor determined a priori as “non-capitalist.”⁶ Drawing alternatively on Marx’s Hegelian conceptualization, the “concrete is concrete because it is the synthesis of many relations, thus a unity of the diverse” (Marx 1986: 37, 38). To be sure, they do not contend that world-systemic patterns, such as core, semiperiphery, or periphery, do not exist. Rather, they point out that both views fail to examine the actual specificities of forms and their interrelationships that constitute the history of world-historical processes and patterns. Thus, whereas Wallerstein emphasizes structural commonalities among forms because they are integrated in a division of labor, the world-historical perspective seeks to examine the distinctions and local specificities of various labor-capital forms and the actual interrelations among these forms (and related historical processes) in the division of labor in order to capture the specificity of core-periphery processes in particular periods, and thus give historical content to the core-periphery categories. Thus, in terms of reconstructing social structures, this method of incorporated comparison “does not presume a structure, but views structure as formed through specific historical relations” and the concrete study of those relations (McMichael 2000: 670). For example, Wolf (1982) and Roseberry (1991) address the transformation of kinship forms of production and ways of life in particular regions of North America in relationship to the expansion of industrial capital and the wage-form as part of the expansion and historical content of capitalism’s uneven development.⁷ Similarly, McMichael (1991, 2000), Mintz (1977, 1978, 1985, 1991), Tomich (1990, 1991, 1997), offer analyses of slavery’s rise and demise in the Americas in works theoretically framed by the

⁶ In Tomich’s contrasting Hegelian terms, “Differences in the demand for specific goods and the material conditions of their production, differences in the social conditions of labor (levels of production costs, productivity, etc.), and the capacity of states and enterprises to organize circuits of production and exchange at once profoundly shape the fate of individual production zones and the scope and complexity of the division of labor” (Tomich 1997: 307).

⁷ Roseberry (1991) continues to use the language of “capitalist” and “non-capitalist” when discussing “modes” of production. However, his arguments are virtually identical to Tomich’s in his call for historical specificity, making “the point that we are dealing with determinate *and* contingent historical processes” and asserting that “We must, in short, analyze regional processes of class formation” (1991: 168).

hierarchical and contradictory interrelationship between slavery and wage labor. Wage-labor neither defines capitalism, as with the mode of production school, nor is just a relatively costly form of production, as with the world-systems perspective. Rather, the industrial wage-labor regime played an historically important role in transforming the world-division of labor.⁸ Modern slavery is not a non-capitalist mode of production. To explain slavery's rise and demise, Tomich proposes to examine the slave-labor character of capitalism and the capitalist character of slavery within the world-economy.

The conceptualization and study of unequal exchange and commodity chains have been similarly bogged by structural generalization. The concept of unequal exchange remains crucial to understanding global inequality, especially if we mean processes other than just "trade." Theories of unequal exchange, from Prebisch (1950), Emmanuel (1972), to Braun (197) and Amin (1977) never recovered from the numerous problems raised by critics (Amin 1977, Mandel 1975, Dore and Weeks 1979, Palloix 1969, Weeks 1981). And this despite attempts numerous efforts to rework the theory (see Amin 1980, Bettelheim 1972, Frank 1978, Köhler 1998, 1999, Mandel 1975, Raffer 1987). Many studies begin with historical overviews of capitalism according to the hierarchical nature of the world-economy in different epochs. Ross (1995), for example, has suggested that the dynamics of unequal exchange have changed again with the decline of core

⁸ For McMichael, Tomich, and Wolf, the industrial wage labor form of production, with its unique creation of surplus-value and relative productivity, decisively altered the nature of the world-economy in relationship to other distinct forms. McMichael writes that "While wage-labor is never the majority form of labor in the global economy, it is nonetheless the core of any historical theory of capitalism... Through the circuit of world money, managed by national banking systems, non-wage forms of labor embodied the valorizing dynamics of wage-labor, *and yet retained their different forms* [and logics]. In this way, wage-labor imposed its value requirements on non-wage forms of labor via the market rule of the gold standard. Under this regime, other forms of labor and national currencies expressed their value, respectively, through the wage form and gold" (2000: 670, 678, italics added). Tomich draws on Polanyi's "account [which] prompts consideration of how the consolidation of a 'market society' and the capital-wage labor relation in Britain imposed new conditions and rhythms on production and exchange in the world economy as a whole. The wage labor regime and industrial production resulted in the demand for new products, the expansion of markets, and an increased velocity of circulation. Free trade, the gold standard, and the 'self-regulating market' (in conjunction with the reorganization of the interstate system and the rise of British hegemony) reorganized and reintegrated production and exchange on a world scale" (1997:305).

"monopoly [industrial] capitalism" attending semiperipheral industrialization during the era of US hegemony. But theoretical studies soon leap into abstract models of trade that seem more intent on sustaining the theoretical possibility of unequal exchange. More akin to the nomothetic works of classical economics, efforts to find the right mathematical formula of unequal exchange are plagued by unrealistic and ahistorical assumptions, such as equal profit rates in core and periphery, perfect international movement of constant capital, or equal productivity rates.

Köhler's recent (1999) contribution to the debate is useful, but also symptomatic of what I think is the key road block in analyses of unequal exchange and commodity chains: the abandonment of the concept of value and analysis of historical class relations. Because the historical distinction among labor forms is not part of world-systems analysis, there can be no theoretical analysis of value relationships within or among historically specific wage and non-wage class/labor relations. The concepts of "surplus," "surplus product," "value," "surplus value," "profit," are used interchangeably in world-systems analysis precisely because differences in form are made secondary and minor (e.g. Wallerstein 1979: 283–293). This perspective thus cannot theoretically grasp the self-expansion of capital through the value form as a defining characteristic of industrial wage-labor, nor the value relationships specific to the class relationships of other production forms. Therefore, it cannot theorize how value is transferred among different forms consequent to their interrelationships in historical commodity networks resulting in unequal exchange. Without a concept of value, local and interstate exploitation is an enigma. Mintz (1978) and Tomich (1990) have developed the concept of value by comparing the dynamics of slavery and wage-labor based on their theoretical-historical interrelationship. Unlike labor-power in the wage regime, slave labor did not take the commodity form and thus did not relate to all other elements of the production process as an exchange-value, i.e. a commodity (Tomich 1990). The specificity of value relations in slave production theoretically reveals the structural limitations of the slave form and its demise as a historical process conditioned by industrial wage-labor. Modern slavery was established to make profits by meeting the needs of the industrial capital/wage-labor relationship as Marx noted (above). But the value relationships specific to the slave form prevented plantations from "keeping up" with the expansionary and rationalizing dynamic of the world economy under the industrial wage-labor regime. But the value theory of slavery in this work is part of a sophisticated and concrete world-historical analysis of irreducible contingent political-economic developments, and so its limitations are recognized. Theory can only go so far. Thick empirical description of specificities and contingencies is also necessary to understand historical change.

Unequal exchange theory in fact has never been about the study of historical developments or value relationships. And on its own terms, it has long been mired in a conception of the core-periphery relationships as “trade” relationships among “economies.” Trade—the movement of commodities across state boundaries—is a political process of price formation and market exploitation and it is certainly an important one. Thus as Wallerstein argues, “once we get a difference in the strength of state machineries, we get the operation of ‘unequal exchange’” (Wallerstein, 1979: 18).⁹ However, unequal exchange should not be conceptually be reduced to state mediations of market relationships. Exchange is only one moment in the cycle of production and circulation. The old critique of world-systems analysis as “circulationist” is fitting here. Omitting analysis of the other moments prevents understanding of the process. The assumption that unequal exchange derives from biased trade and exchange terms resulting from state mediations begs the question, for it fails to examine the forms, and forms of integration, of distinct value/class relationships with different value relationships, productivities, and market structures of valorization. Lacking a concept of value, unequal exchange theory and world-systems analysis are unable to theoretically comprehend interstate exploitation in axial commodity chains. Instead, this perspective offers (albeit astute) generalizations of empirical processes.

Recent studies of “global commodity chains” (GCCs), including Chase Dunn (1989), Gereffi and Korzeniewicz (1993), and Wallerstein, Özveren, Pelizzon (2000) explore the historical networks of the world division of labor and specify the changing content and spatial location of integrated production processes. The thrust of production-network analysis thus far is oriented toward long-run, large-scale quantitative measurement and descriptions of activities. Explaining how inequality results from the division of labor is not the immediate task. To be sure, when correlated with GNP per capita, the study of production chains does confirm “an unequal distribution of wealth among their nodes” (Korzeniewicz and Martin 1994:70). But surprisingly scant empirical or theoretical attention is given to the historical relations of production and the juxtaposition of those relations in commodity chains. In this regard, it is ironic that a conception of unequal exchange (or value) plays no role in current commodity chain analysis, since, as Martin notes, the category was developed precisely to overcome the

⁹ “This chain of the transfer of surplus value frequently (often? almost always?) traverses national boundaries, and when it does, state operations intervene to tilt the sharing among bourgeoisie towards those bourgeois located in core states. This is unequal exchange, a mechanism in the overall process of the appropriation of surplus value” (1979: 293).

definitional restrictions of unequal exchange theory, being built as it is on a conception of trade rather than the division of labor. Perhaps explaining unequal exchange has become insurmountable from this perspective given the empiricist and generalizing thrust of commodity chain analysis, which Martin advocates.¹⁰ How disparities arise through the relations among value forms with distinct capital-labor relations, and how prices diverge from values in interstate markets as consequent to the very integration of different forms of production of axial commodity chains, still remains a theoretical mystery in world-systems literature.

Both unequal exchange and commodity chain analysis have neglected the study of the historical forms of labor and their interrelations in the division of labor. The body of this paper makes use of the incorporated comparisons method to reconstruct agencies and changes in the social relations, labor forms, and struggles of the Japan–US silk network to highlight local and interstate inequality. It seeks to explain social change through the study of specific relations in part of the 19th century world division of labor. A concrete understanding of unequal exchange may be achieved by analyzing how historical forms of class relations, labor, and value are *interrelated* and shape market forces in historical production networks. The categories of “unequal exchange,” “commodity chains,” and “class relations/forms of production,” do not have to be treated as independent “fields of inquiry”—as though they directly express empirically discrete historical phenomena. Rather, the meaning of these conceptions, as well as that of “core” and “semiperiphery” may be relationally defined as dimensions of social processes constructed through the study of the Japan–US silk network. In this respect, this paper is not about unequal exchange or commodity chains or class relations per se, but about formative aspects of systemic inequality of modern society. The point is not to develop a field of research or a grand theory of unequal exchange or global inequality but to understand concretely how classes and interstate inequalities formed and changed both locally and globally in a single process of mutual formation and transformation.

THE JAPAN–US SILK NETWORK AT A GLANCE: THE ARGUMENT

The mutual formation of distinct production forms, with their particular labor/capital value relationships and their specific interrelationships forming axial commodity chains is fundamental to the process of interstate value trans-

¹⁰ “Any understanding of core-peripheral relationships via commodity chains research requires the development of a large set of commodity chains over a significant period of time” (Martin 1994: 159).

fers or unequal exchange. As an alternative to the dilemmas of world-systems models, unequal exchange theory, and production chain analysis, this paper adopts an incorporated comparison approach to examine the agencies and structures of the Japan–US silk network. In this section, the conceptual framework and main arguments are introduced.

The formation of the Japan–US silk network marked the end of historical society—the Tokugawa system—and contributed to the formation of Japan as a modern state of the capitalist world-economy. The formation of the Japan–US silk network during 1854–1886 was a key part of Japan’s incorporation. The transitional nature of the process is clearly demonstrated by the rapidly changing labor-capital relationships and forms of collective protest in the network, including Japan’s very last millenarian peasant uprising in 1884 among indebted sericulturists; its very first known factory strikes in 1885–86, by women raw silk reelers in Kōfu; and by strikes among unionizing workers in patriarchal and highly mechanized silk factories in Paterson, New Jersey, 1885–86 (Boles 1996, 1998). The “local” conditions of each conflict were molded by the interdependence of their circumstances—the division of labor—of the Japan–US silk network.

In view of their interdependence, the forms of production and protest in the Japan–US silk network are not treated as though each has a self-contained logic or pattern. Each locale was a point of convergence into which entered the conditions of the other relations. By purchasing raw silk and sustaining raw silk production in Japan, the factory relations of mechanized silk production in the US entered into the historical environment of peasant sericulture and rebellion, as well as raw silk reeling, patriarchal relations, and mill strikes by women workers in Japan. Conversely, the social relations and conditions of sericulture and raw silk reeling in Japan, through raw silk exports, entered into the conditions of factory production and gendered class conflicts in Paterson, New Jersey.

If these capital-labor forms were interdependent, they were nevertheless unequal. Silk production relations in Japan became subordinated to industrial manufacture relations in the US, expanding and changing to fulfill US factory and consumer demand for raw silk. At the most general level of abstraction, unequal exchange was the combined result of the very juxtaposition of distinct labor-capital and material relations. As suppliers to the highly mechanized and productive US silk manufacturing industry, Asian producers of raw silk were far less productive per person and far more numerous in absolute terms. As a result, they faced greater market competition with each other as producers-sellers of cocoons or labor-power in mills. The relatively few engaged in industrial manufacture intensified market competition as oligopolistic buyers of raw silk and as oligopolistic sellers of finished goods. The conjoining of historically specific industrial wage and non-wage forms within the Japan–US silk network thus

created and sustained infundibular markets—relatively competitive at one end and oligopolistic at the other.

The “hourglass” shape of the production chain resulted in different market pressures that effectively altered the prices of value magnitudes. Market pressures in competitive sectors lowered prices of certain goods below their value. Thus, at the point of interstate exchange, the low price of raw silk was not simply a manifestation of intense class exploitation between landlords and peasants who produced cocoons or within the Japanese mills between owners and workers. Rather, the integration of specific forms of production and class relations through markets created the uneven pressures on the prices of commodities (including currencies) in those markets which resulted in the “de-valorization” (price-lowering) of the exchange-value of raw silk. The buyer of raw silk gained a greater magnitude of value than was represented in the given quantity of money.

The expansion and profits of mechanized silk production in the US were thus based not only on greater productivity and labor exploitation within the production process of US silk factories, but this simultaneously conditioned (lowered) price of raw silk below its value, and thus provided value subsidies to US producers.

I am not suggesting that unequal exchange can be explained solely within an analysis of the Japan–US silk network. The purchasing power of the US dollar was not the result only of the relations of production and productivity of US silk factories. Theoretically, it reflected a preponderance of certain kinds of production relations in the US, their integration with other forms of production in other areas, and consequent price-reducing and price-inflating market and political forces.

Generalizations of unequal exchange relations “remain an empty phrase if one does not know the elements on which they are based” (Marx 1986: 37). The relations and interrelations of production that resulted in ever-lower priced raw silk were the result also of contingent local relations, processes, and agencies that were specific to the labor-capital relations of 19th century silk production in Japan and the US. Technological limitations and technological advances in production, a rising landlord class and rising working class, and intensifying class-patriarchal relations of exploitation in both the US and Japan, decisively conditioned value magnitudes and prices of labor both within and among the production nodes. Patriarchy “devalued” the labor of women workers and allowed the price of raw silk to be lower than it otherwise would be. US manufacturers could and did seek to reduce their costs by thwarting the growing (patriarchal) union control of production and rising labor costs.

The price-lowering patriarchal relations of factory production that conditioned unequal exchange cannot be presumed, for they were not automatic. They were created and changed as women workers were incorporated into production activities in new ways, and resisted worsening conditions in a continuing cycle of social and production contradictions. When Japanese entrepreneurs faced ever-intense competition to meet ever-increasing US demand, they also of course sought to reduce costs and change production relations to their advantage, which worsened conditions and led to the Kōfu strikes. These developments hastened efforts to remake class-patriarchal relations of production, which transformed the unequal exchange relationships and the characteristics of the Japan–US silk network.

One striking outcome was the opposite spatial strategies of local expansion that US and Japanese entrepreneurs took to cope with labor unrest and competition. Entrepreneurs in Paterson decentralized silk manufacturing operations to annex facilities in smaller towns, where they hired semi-skilled women and child laborers to operate new semi-automated and mass-production machinery. Filature owners in Japan gained greater control over female workers and circumvented the day-labor form of production by concentrating work in large-scale filatures in “silk cities” and by hiring young unskilled women from indebted peasant households to live in adjacent factory dormitories. Technology did not improve significantly, but costs were dramatically reduced and output was increased both per person and absolutely as new producers established facilities and existing producers enlarged factory size.

In rural areas of Japan the triumph of local landlords/creditors over indebted peasants was more devastating and extensive. At no other period before or since did so much rural land come into the control and private ownership of the rural wealthy than during the 1880s. The Chichibu rebellion of 1884 among small-plot holding sericulturists facing unprecedented land forfeitures, was the last armed peasant uprising that was inspired largely by millenarian figures and deities, but also by compatible notions of equality and freedom of the concurrent Liberty and People’s Rights Movement, Japan’s first nationwide struggle for Western representative government and civil liberties. Both movements were crushed by government military forces. In the following era of government oligarchy landlordism became rampant. Peasant resistance to the untrammelled expansion of rural banking and landownership, and to perhaps the lowest cost sericulture industry on the planet had been cleared away.

Studies of these local struggles and developments by others have not considered their interrelations within the Japan–US silk network. Analysis of the network’s unequal division of labor permits the connections among seemingly disparate events and forms of collective protest to be understood. The method

of incorporated comparison within a commodity network may therefore reveal the world-historical dimensions of local events and, conversely, the local faces of global capitalist expansion and unequal exchange (Tomich 1990).

GLOBAL PROCESS: THE JAPAN–US SILK NETWORK’S FORMATION

The explosive pace of mechanized silk production in the US after 1865 was matched by an explosive growth of raw silk production for export from China and Japan. This culminated in the formation of the Japan–US silk network between 1882–87. Prior to that time, most US raw silk imports had come from China, of which ten percent was shipped directly to the US and another fifty-three percent indirectly through London. About thirty percent of total US raw silk imports came from Japan.¹¹ However, imports of Japanese raws rapidly increased thereafter and by 1882 the US imported more raws from Japanese than China. By 1887, US imports of raws from Japan surpassed imports from all other countries combined, averaging over fifty percent of total imports between 1887–1895. The percentage of imported Chinese raws by comparison fell to an average of about twenty-three percent during the same years.¹²

Japan also began to export more of its raws to the US than to all other countries. In 1884, the year of the Chichibu rebellion, merchants began to regularly ship most of Japan’s raw silk to the US rather than to France. These trends became a structure. Between 1886–90, more of Japan’s raw silk was shipped on average to the US than to all other countries combined.¹³ The Japan–US silk network thus formed, and at the same time, so did a China–France silk network form.¹⁴ As a result, in contrast to the wild swings of raw silk prices in the British,

^{11.} About 8.4 percent of US raw silk imports came from France, and 0.1 percent from Italy. Sugiyama, S., (1988) pp. 85, 104.

^{12.} Ishii, Kanji (1972) p. 41.

^{13.} Sugiyama (1988) p. 80.

^{14.} By the mid-1870s “more than half the total silk exports from China was earmarked for direct shipping to France” (Sugiyama, S. 1988 p. 94) During the 1876–80 period merchants directly shipped the majority of China’s raw silk to France rather than Britain. This turn around was partially initiated by the French government and private banks which, at the instigation of the Lyons Chamber of Commerce, established a steamship line between Shanghai and Marseilles (Eng, 1986:29). French banks also created a new credit system to facilitate the silk imports and Lyonnaise merchants formed a buyers association to purchase silk in mass quantities. As to France’s imports, during the same 1876–80 period about 14 percent of the country’s raw silk imports were re-exports from

French, and US markets during the 1860–1880 period, a new and more settled regularity of price changes emerged.¹⁵

The world silk industry came to be dominated by these two networks but as the result of a number of world-historical events. A prebline blight during the 1840s ruined the European silk sericulture. France's silk industry began to recover when Britain "opened" China and shipped large quantities of inexpensive raw silk to London and on to Lyons, among other places. However, the French industry was transformed. Silk manufacturers took drastic cost-cutting measures to circumvent organized and Luddite-like urban workers by increasing mechanization, expanding putting-out networks, and moving entire factories to rural areas to take advantage of rural desperation and patriarchal norms with the use of cheap female labor.¹⁶ The number of textile jobs in Lyons, for example collapsed. In 1861 about eighty thousand textile workers labored in the city but by 1891 the number had fallen to about thirty six thousand.¹⁷ As the number of rural women workers increased, the continental silk industry became provincialized and feminized.¹⁸

The rise of Britain's trade in China brought recovery to the French silk industry. Ironically this and the growing strength of British trade and finance in general also sounded the death-knell for the British silk industry (and Italian sericulture by virtue of competition with the growing imports of cheaper raws

Britain, while 70 percent was shipped directly from China. Imports of raw silk directly from Japan to France comprised only 14 percent during the same period, and via Britain re-exports, about the same (Sugiyama, S. 1988, pp. 85, 88, 94, 104). By 1880, "Lyon supplanted London as the central market for the distribution of Asiatic silk" (Eng, 1986:29).

^{15.} See Sugiyama's (1988) tables on raw silk prices in the London, French, and US markets, pp. 92, 96, 105.

^{16.} As Sione explains silk manufactures "introduced the power looms as a way to break the strikes of militant workers, who had been counting on their skills to protect their bargaining power, and control access to jobs. Reactions to mechanization, however, increased entrepreneurs' resolve to fire skilled, expensive, and militant weavers and replace them with workers [women in particular] willing to accept employment at lower wages. The expulsion of urban and skilled, but also rural silk workers took place throughout Europe." Sione (1994) p. 563.

^{17.} Sione (1994) p. 564.

^{18.} See Struminger's work on nineteenth century French peasant women who, like their Japanese counterparts later in the century, left the rural home industry and moved to urban areas, especially Lyons, to work in the filatures where their work and techniques were closely supervised. Struminger, Laura (1978) "Les canutes de Lyon (1835–1848)" *Mouvement Sociale* 105 (October-December), pp. 59–85.

from China by British shippers). British Parliament passed the Cobden Treaty to further promote free trade in 1860 which abolished protective tariffs on silk imports from the continent. Many British producers, unable to compete with the continental silk manufacturers despite rapid gains made in the mechanization of silk production, moved their operations wholesale during the 1865–75 period to the US where they would flourish within a protected market of high-income consumers.¹⁹ The decline of Italy, and an overabundance of silk workers on the continent (also partly caused by growing mechanization), supplied English silk industrialists in the US with skilled silk laborers.

They immigrated across the Atlantic in search of better opportunities at the time that British silk capitalists and their equipment arrived in Paterson, New Jersey. New jobs were created and new life was given to the city's machine-shop industry. Wages were high as labor was scarce. To stretch productivity (surplus value), British industrialists invested in new labor-saving machinery. Previously a leading center of industrial machine shops including the Colt Arms company and various producers of cotton textile machinery and locomotives, the skilled machinists in Paterson began making key innovations in silk machines. The three-tiered spinning frames invented by the Danforth Locomotive and Machine Company, for example, "were to revolutionize the thrown-silk business; a 'fact recognized...by veteran English silk manufacturers in this country' by 1876."²⁰ That year observers began referring to Paterson not as the "New Manchester" of America but, with even greater confidence, as the new "Lyons of America."²¹

In the two axial silk networks that formed, Japan and China began specializing in the low-technology and labor-intensive production of raw silk which supplied the relatively advanced technology and capital intensive silk manufacturers

^{19.} "The collapse of the British silk industry created spare capacity. As mills closed down, quantities of surplus machinery were sold and shipped to the United States." (Margrave 1985:19) On English migrants he writes, "Old established centers of excellence in silk manufacture in Britain, such as Coventry and Macclesfield, entered a period of rapid decline. ...Increasingly during the period 1860–80, workers, entrepreneurs, and their families moved directly from Macclesfield to Paterson." "The eventual high concentration of English-born immigrants who owned silk businesses in [Paterson] was perhaps the most pronounced example of systematic entrepreneurial involvement in any later nineteenth-century American manufacturing industry by members of this ethnic group." Margrave (1985) pp. 19, 12, 27.

^{20.} Margrave (1985) p.21

^{21.} Brockett, L. P. (1876) p. 109.

in US and Europe. With the rising demand from the US for raw silk, Japan's entrepreneurs and peasant sericulturists began to gear production for the export market.

Although Japan had been forced by the US to engage in trade with Western countries on unfavorable terms, Japanese oligarchs not only permitted the entry of Japan's raw silk producers into the world-economy, they encouraged it. Both Tokugawa and Meiji leaders realized that raw silk exports provided the state with foreign gold currency needed to stabilize the Japanese yen, to purchase foreign technology, especially military technology, and in turn to enhance Japanese military and industrial power (Ishii and Sakiguchi 1982). The combination of mechanization and high labor costs led US silk manufacturers to rely on Japanese raws.²² Medium quality silk was of a regular and predictable strength compared to lower quality raw silk. It broke less frequently and thus reduced the

²² "It happens that conditions of manufacture [require that raw silk] be of uniform strength and thickness. The cost of labor is so great here that we cannot afford to stop a machine in order to pick out flaws and irregularities in the threads. Consequently, the American manufacturer must have raw silk which works satisfactorily on his high speed machinery with a minimum amount of manual labor and waste. It was impossible for him to take low grade silks, re-reel and clean them as was done in Europe at that time. Indeed, the high price of labor, and the speed of the machines in the U.S. made low grade [raw] silks more expensive than the higher grades, which could be worked with less labor and at higher speed. Mason, F. R. (1910) p.13.

Li says that the French still used hand looms while Americans were using power looms that required more uniform raw silk. "Unlike the French, who still used hand-loom for high-quality silks, the American weaving industry in centers such as Paterson, New Jersey used power looms, which required standardized raw materials ... 'Chinese silk is either excellent or rather poor in quality ... Japanese silk is of a more uniform quality'" Li, (1981), pp. 84–85.

Eng also agrees: "There is some plausibility to the argument that the quality requirements in France and the United States differed and that the Japanese, by promoting scientific innovations that made possible the massive exports of high-quality silk most suitable to the highly mechanized American market, were able to dominate that market. In France, where silk weaving continued to be carried out to a large extent on hand looms and where labor (cheap relative to American labor) was available for sorting, cleaning, and re-reeling, less expensive silks from China and the Levant were preferred. As late as 1900, power looms amounted to only one-third of France's 90,000 looms." Eng, R. Y. (1986) p. 166. For an extended discussion, see Boles (1998), Ph.D. Dissertation, *Rebels, Gamblers, and Silk: Agencies and Structures of the Japan-US Silk Network, 1860–1890*.

time that workers would spend picking out irregularities or leaving machines idle to repair breaks. In contrast, European manufacturers could afford *not* to invest in mechanized production, in part, because labor had become cheaper than in the US.

The rise and expansion of the mass-production US silk industry, as exemplified in Paterson, also hinged on developments in global transportation which reduced the transport costs and time of shipping large quantities of raw silk. The completion of the Transcontinental Railway in 1869 was quite timely and was itself a world-historical development that used some 10,000 semi-coerced workers from China (Wolf 1982: 377) and international finance capital. The new route shortened transport time between San Francisco and New York from twenty-two days by sea to six days by rail and was cheaper than other routes.²³ Within a year of the railroad's completion, San Francisco became the main *entrepôt* for Japanese silk imports, and quantities flowing through the city by the bay surpassed those via New York by 1871.²⁴

STATES AND UNEQUAL EXCHANGE

Prior to examining the network's division of labor and struggles, it would be helpful to address in general terms why the more profitable activities of the Japan-US silk network were established in the US and not the reverse. This question is related to why the inequalities of historical capitalism occur not only at the level of classes within states, but also rather glaringly at the interstate level among states (or territories). This section therefore outlines basic structural factors behind interstate inequality as a theoretical view of the interstate characteristics of the Japan-US silk network's division of labor and how the functioning of this network sustained and exacerbated both interstate and intrastate inequalities.

Key structural aspect of states that account for inequality at the level of states include the truncation of labor markets and national currencies. Restrictions on immigration and citizenship and monopoly control of a currency are defining

²³ Eng (1986) p. 164.

²⁴ "In 1871 imports of raw silk into San Francisco reached 449,295 lb. (US \$2,013,081), surpassing imports into New York, which amounted to 343,670 lb. (US \$1,827,893). Imports from Japan which had hitherto come via Britain, were also gradually diverted directly to the United States through this new route. During the period 1875 to 1885, on average, 77 per cent of imports of raw silk to the States came through San Francisco." Sugiyama S., (1988) p. 106.

features of modern states (city-states and nation-states). Given the limited labor supply in a country that results from restricted labor markets, it may be observed that when a country experiences a sustained rise in global demand for goods produced by enterprises operating largely within that country, the effect will be increased domestic demand for labor to meet growing demand and production. Labor shortages will tend to drive up domestic wages regardless of the success or failure of labor organization. At the same time, purchasing power of the national currency will increase because consumers within and outside that country seek that currency to purchase the goods sold by the enterprises of that country.

To the extent that the state's currency is strengthened, the individuals and enterprises of that country will find that the cost of goods, including materials and finished items produced in other countries, are now relatively cheaper. Consumers in the country experiencing this growth may obtain some finished goods produced abroad for less, while enterprises of that country may enhance their world-market position by lowering the cost of their products in line with the lower costs of production related to the now less expensive materials purchased abroad. On an aggregate scale, the standard of living of the residents of this developing country have relatively improved while the reverse is true of the other countries. The prices of the materials and finished goods sold by the unlucky country to the developing country (whose goods are in greater world demand) have relatively fallen, as has the relative purchasing power of the state's currency. If this process is sustained over the middle run, the effect will be to entrench interstate inequalities by altering the world division of labor. Entrepreneurs in the unlucky country will find new opportunities to supply the materials and goods that the consumers and enterprises of the developing country want. The activities that these unlucky countries engage in will thus change to meet the needs of the "developing" country (and thereby close the door to engaging in other activities).

Fundamental to this the axial characteristics of the division of labor are the different rates of productivity in the different countries and the associated differences in "entry costs." If the so-called Industrial Revolution was a stage in the development of core areas and the underdevelopment of peripheral areas, it nevertheless dramatically altered the world division of labor (Arrighi 1995, McMichael 2000; Tomich 1997, Amin 1977, Hobsbawm 1987, Wolf 1982). Emmanuel was on target in emphasizing zonal differences in productivity consequent to industrialization in Western Europe. The concentration of the industrial capital-wage labor (and the attending military power it afforded to the various conquistadors of Europe), meant that areas incorporated and reorganized to supply the large supplies needed for mass manufacture would have to make use of existing less costly but also less productive forms of labor: wage-labor, non-wage labor, and

new non-wage forms, such as New World slavery, indentured workers, peasants, and so on.

If this was a competitive era insofar as many British and West European workshops competed for shares of world markets, it was also a new era of oligopoly capitalism insofar as the industrial core firms were relatively few in number, and maintained a very high ratio of output per firm by comparison to the much larger number of enterprises and workers producing the raw materials processed by the industrial firms. Price reducing competition among peripheral producers qua suppliers to core producers is relatively much greater because (a) the number of producers is greater (because entry costs are lower) and (b) core producers are fewer because they can afford to invest in the (more costly) productive activities that enable them to process the large quantity of materials from the peripheral and semiperipheral producers.

On the whole, the axial world division of labor and the constitutive axial periphery-core and semiperiphery-core markets were infundibular or perhaps more accurately, "hourglass" shaped. Although the narrowest bottlenecks were probably to be found in high finance, which thus appears to be the "real home of capital" in Braudel's words, oligopolies in trade (Venice, UP) and later in industry (UK, US, Japan and Germany) were the foundations of the financial rebirths of historical capitalism (see Arrighi 1995). World demand for core goods and services gave rise to core inflation and the relative strengthening of the global purchasing power of core currencies. The relatively greater income of entrepreneurs combined with their increased demand for, and ability to pay for, relatively scarce skilled labor (the white collar workers and engineers of industry and finance) generated higher wages and in turn additional core inflation. As core incomes rose and the middle strata expanded, growing domestic consumer demand for the provision of goods and services further increased demand for domestic labor and the national currency.

This cyclical process inflated the price of all labor in the core beyond the socially necessary labor time for the goods and services provided, which was falling as productivity increased. In turn, the strengthening of the core states' national currencies provided the average resident with increased and increasing world purchasing power over the average semiperipheral and peripheral residents' purchasing power, or rather, over their labor and the products of their labor.²⁵ This kind of process continues today, as manifest in worsening terms of

²⁵ Here the idea of overpriced value (price and value discrepancy) is applied at the interstate level. Marx applied the idea of overpriced value at the level of competing firms in the same industry. For Marx, the magnitude of a commodity's value, as a quantity

trade between core and periphery and growing wealth disparities (see Köhler 1998, 1999), and as the agencies of strong core states, such as the International Monetary Fund and World Bank impose currency devaluations on peripheral countries. Thus, although some production activities in core states are identical to those in semiperipheral and peripheral states, remuneration is generally far greater in the core due to the combination of greater productivity and currency evaluation as aspects of the division of labor. And as long as the wealthy of the core do not transfer their assets out of the national currency, it will remain relatively strong over the long run, national labor will remain relatively costly, and national living standards of the middle class relatively high.

In sum, the creation of interstate axial production processes engendered infundibular markets with bi-polar price-reducing pressures on peripheral commodities/services and price-increasing pressures on core commodities/services. At one end of the hourglass-shaped axial production network, competition among peripheral producers drives down the prices of goods below their value or the socially necessary time. Simultaneously, prices of the peripheral suppliers are further driven down in the “middle bottleneck” by the oligopolistic purchasing power of core enterprises because the many peripheral and semiperipheral sellers are “locked in” as sellers to these fewer core buyers (which is technically possible because of the superior industrial productivity and purchasing power of the core enterprises). Moving from the “middle bottleneck” out to the wide end that represents the world-market, core producers then enjoy reduced competition with each other, by comparison to their many peripheral suppliers, as sellers to the entire world-market for their goods. Thus, the expansion of industry (the capital-wage labor form) hinged not only on the ability to create surplus value (or superior surplus value) through industrial productivity, but was furthered by unequal exchange: the receipt of value from the purchase of cheap goods. We may now see this process in the development of the Japan–US silk network.

of socially necessary labor time (the average labor time expended to produce a good), can and will usually differ from the magnitude of value expressed in money (price). A more mechanized and productive firm, for example, is able to temporarily lower socially necessary time below the average for that industry and therefore increase surplus value and profits through an unequal exchange of that good (produced with less average labor power) at the established market price. Unequal exchange in this case occurs without a loss to the buyer (Marx 1977).

AN INFUNDIBULAR DIVISION OF LABOR

By 1884 the Japan–US silk network’s division of labor had formed largely in response to the needs of US capital for larger and larger quantities of cheap raw silk. As of the mid-1880s, Japan’s engagement in the silk industry of the world economy centered on raw silk production. Toward the US flowed semi-finished silk products required for the subsequent production processes toward the final product that was sold in the US consumer market. Merchants shipped the raw silk from Yokohama to San Francisco, and to New York brokers, who in turn shipped it to factory towns, Paterson, New Jersey above all others. In the Paterson mills workers used the most complex technology and machinery to throw, wind, warp, and weave fabrics, while dyers applied their secret chemistry skills to color the pale fibers. In the opposite direction flowed forms of money which sustained the continuation and expansion of the raw silk production in Japan, above all.

Sericulture and silk production in Asia prior to the advent of Western imperialism was a highly developed industry, but with the start of Asia’s incorporation into the world-economy, sericulturists and raw silk reelers throughout Asia faced each other in newly formed world markets which brought them into unprecedented competition and subjugated their activities to the needs of industrial silk manufacture in the core. For the first time in history, silk production in the West and the Far East became interdependent parts of a single division of labor. Production activities in the division of labor were linked by market (and intrafirm) exchanges, the dynamics of which were fundamental to the processes of unequal exchange.

Markets create inequality because they are fundamentally structured by distinct forms of production which compose a division of labor. There were as many markets as there were types of silk goods, from egg cards and mulberry leaves, to basins, cocoons, and raw silk. These markets were at once local and global in nature. In Japan, the egg cards and mulberry leaves produced to make cocoons, for example, were overwhelmingly produced and sold within local and regional markets conditioned by prefectural government regulations and taxes, and employer cartels. The relatively intense competition in the sericulture and raw silk markets, as compared to the mechanized weaving, spinning, throwing sectors in the US, was conditioned by the nature of sericulture as a relation between man and nature and as a social relation among people. It was very labor intensive, could not be mechanized, and was affordable for peasants to engage in to earn some cash. Hundreds of thousands of peasants, perhaps millions, in Japan and China engaged in sericulture and silk reeling, and the numbers grew

each year with expansion of Western silk manufacture.²⁶ One measurement of the “striking expansion of sericulture” in Japan was the increase in the area put under mulberry cultivation.²⁷ Another measure was the growth of US raw silk inputs which nearly tripled during the 1876–1890 period, as global prices for raw silk dropped.²⁸

Competition and demand created new market “niches” and classifications of raw silk according to varying local qualities to which corresponded new hierarchies of remuneration to producers in different regions. New mills arose in “new” areas, some older even ancient silk areas declined, and others found

^{26.} Hemmi explains that during the 1870–90: “The point to be stressed is that sharp competition dominated the reeling process from the silk producing region to the export ports and competition among exporters was also keen.” Hemmi, Kenzō, “Primary Product Exports and Economic Development: The Case of Silk,” Hemmi (1970) p. 315.

Tussing similarly states that “The availability of this previously un-utilized labor time, plus the rapid increase in population, was sufficient to assure a virtually ‘unlimited supply of labor’ over the whole [Meiji] period, even the highly skilled indigenous occupations. The unit price of labor in real terms, whether measured explicitly in wage rates or implicitly in the incomes of family enterprise, remained low. ...In this context, the output of products like raw silk and silk textiles could respond readily to the pull of outside demand...” Tussing, Arlon, (1970) pp. 218-9.

^{27.} “The striking expansion of sericulture is evident in the rapid increase in the mulberry area and the spectacular expansion of cocoon production. According to the official statistics of the Ministry of Agriculture and Forestry, the index of mulberry area, with 1881–1890 = 100, increased to 176 in 1891–1900, 234 in 1901–1910, 307 in 1911–1920, and 371 in 1921–1930. The corresponding changes in the index of cocoon production were: 172, 263, 470, and 714.” Hemmi (1970) pp. 317.

^{28.} Both overall US imports of raw silk, and that from Japan specifically, increased while prices decreased. Average total imports to the US increased from 1,874 thousand lb. during the 1876–80 period to 3,507 lb. during 1881–85, to 5,193 during 1886–90. In 1880 there were 31,337 US silk workers and in 1890, 49,382. Computed from Sugiyama S. (1988) pp. 100, 104.

Sugiyama claims that the drop in raw silk prices of Japanese raws throughout this period was due largely to their declining quality. However, had Japanese raws deteriorated in quality, they would have lost their middle ranking between Italian and Chinese raws, which they did not. The declining prices in general are better explained by growing supply (and also, as we shall note below, by intensified exploitation of female workers). Moreover, that raw silk prices around the world tended to decline and fluctuate in close synchronicity after 1880 is a strong indicator of the regularity or “structured-ness” of the Japan–US and China–France networks. See Sugiyama’s tables on raw silk prices in the London, French, and US markets, Sugiyama S. (1988) pp. 92, 96, 105.

special niches (see Appendix I). Small peasant household producers tended to market lower quality raw silk or to specialize in cocoon production for use by the medium and large mills. The relative decline of raw silk output among small peasant households was a reciprocal relation to their increasingly specialized role as cocoon producers for the new highly productive mills.

The large filatures, most of which were established by wealthy silk merchants, arose in the “new” silk districts like Kōfu, Suwa, and Amami in central Japan, in which owners hired between fifty and 100 women who produced most of the country’s higher and more regular-quality raw silk. The large semi-mechanized filatures also gained a relative measure of oligopolistic power over the myriad of small peasant suppliers of cocoons. Within the national and international market, they provided the keenest competition for small and medium-size raw silk producers, including the peasant household in mountainous areas of Japan like Chichibu that eked out a living from season raw silk production (see Appendix I). The larger producers not only produced greater quantities of higher quality silk more months of the year, but as a result they formed close connections to, or even partnerships with, wholesalers which enabled them to create local oligopolistic bottlenecks that provided a degree of price control. In addition, the larger mills could better survive market fluctuations and the harsh state development policies which small peasants could not and consequently fell into bankruptcy and land forfeiture. Out of desperation, they often sold their silk goods at even lower prices.

All silk producers of raw silk throughout Asia confronted one another indirectly in world silk markets. Global competition ran “back” to input suppliers as entrepreneurs coped with competition in the selling (or “output”) market by finding the lowest priced cocoons in the buying (or input”) market. And since the number of peasant cocoon producers was growing rapidly, the tenuous circumstances of the small peasant proprietor worsened competition. It was particularly fierce among peasants in mountainous areas like Chichibu who, since the Tokugawa era, were dependent on cash earnings to repay seasonal loans, purchase foodstuffs, rice above all, and pay taxes. Hence, global market competition was felt most acutely at the “bottom” of the commodity chain. It was there that the prices of labor, or the products of labor, were initially lowered well below their socially necessary values.

The contrasting competitive/oligopolistic characteristics of the market structures that linked the specialized, complementary, and mutually sustaining activities of the axial network corresponded to the number of participants in a sector and to the forms of production and productivity of that sector. Mechanized raw silk production in the US was capital-intensive and expensive. A relatively few people on the planet had the skills, wealth, and/or access to capi-

tal, the industrial infrastructure (e.g. machinists, transport, etc.), and consumers with sufficient incomes, to profitably engage in manufactured silk production. But if one could, then one could take advantage of the very cheap material inputs produced by hundreds of thousands of poor people in other countries. The scarcity and profitability of the US sector rested in part on expensive high-speed mass-production machinery. Mass production was among the very conditions of mechanized production that globally limited the number of producers and hierarchically structured the world markets of the Japan–US silk network. It became possible for a very limited number of producers to very quickly manufacture the large quantities of raw silk that had taken far more workers and enterprises in Asia a far longer time to produce. In fact, there were only several tens of thousands of US silk workers and far fewer firms. In 1880 the *entire* US silk industry was composed of only about 31,337 workers and about 382 establishments, averaging about 82 workers each. As the quantity of Japanese raw silk shipped to the US grew, the number of workers in each US factory grew; the average size increased by nearly thirty percent with about 105 workers per factory.²⁹ By 1900, Paterson's silk industry had grown to include only 175 weaving firms and 20,000 workers—about 114 workers per factory.³⁰ The average number of workers per factory in the US silk industry increased to about 135.

The average number of workers in company reeling mills in Japan, by comparison, was about sixty-seven in 1900,³¹ and of course, there were hundreds of thousands of home reeling operations among peasant and farmer households. The growth in the number of US factories and their productivity drove demand for raw silk to new levels. US raw silk inputs increased 2.7 times during the 1876–1890 period, the labor force increased only 1.5 times. The quantity of raw silk processed by the average US worker increased from a ratio of 59.8 to 1 in 1880 to 105.15 to 1 in 1890. Indeed, US workers manufactured almost twice as much raw silk per capita in 1890 as they did 14 years earlier while the price of US silk goods more than doubled even though raw silk prices declined.³² In effect, the narrow end of the infundibular silk network became relatively narrower during the 1880s as the US manufacturing sector shrank in size relative to the raw silk industry's expansion. And it had to be this way. Barring any dramatic increases in productivity in the sericulture sector, growing productivity of the mechanized

²⁹ Sugiyama, S. (1988) p. 100, 104.

³⁰ Scranton, (1985) p. 3-4.

³¹ Calculated from Sugiyama, S. (1988) pp. 100, 126.

³² Sugiyama S. (1988) pp. 100, 103, 104.

sector required absolute increases in the number of producers, which in fact occurred as noted. The effects of the infundibular structure of production were the creation and shaping of infundibular markets. The markets came was the moment of exchange which expressed the unequal division of labor and specific local circumstances and relationships.

The mutual interdependence of the network's various forms of production resulted in an unequal distribution of wealth and life chances. Lower remuneration to peasant silk producers was manifest, in part, in their relatively lower and worsening standards of living, caused in part by the very dissolution of the peasantry through fantastic increases in debt, bankruptcies, foreclosures, and landlordism (see below). But it was also manifest in the wages of factory workers. Japanese reelers earned about 7.5 cents per day, less than filature reelers in Italy and China, and they worked the most, about 12–15 hours a day.³³ Japanese reelers were also among the lowest paid wage-workers in Japan, largely because they were women, as we shall discuss below in the section on the Kōfu strikes.³⁴ By comparison, throwsters in Paterson, who were in the low-wage bracket among wage-workers in the city, received about 67 to 78 cents a day in 1885.³⁵ Comparisons based on a relative price index would show that US workers received greater compensation for their labor than Japanese peasants and mill workers.

The question may be asked, “Why couldn't Japanese entrepreneurs engage in the lucrative mechanized sector of global silk industry?” The simple answer is that they could not afford the high entry costs—but a full explanation would require nothing less than discussing the histories of modern capitalism, the Tokugawa system, and their intersection from the 1850s. Suffice it here to note the structural result and constraints. With state subsidies, Japanese investors might import some of the spinning and throwing equipment available in the US. However, they could not have afforded the complementary industries and infrastructure required to operate and maintain the advanced silk weaving factories or afforded the training of Japanese machinists to do so. In fact, at the time, Japanese entrepreneurs could barely afford to import the less technically advanced silk reeling equipment from Europe or less costly cotton weaving

³³ Sugiyama S. (1988) p. 128, Table 4-16; see also Ishii's calculations, Sugiyama S. (1988) p. 247.

³⁴ “Japanese wage rates in the Meiji era were a pittance either by Western or by contemporary standards; and the wage rates for female silk-reeling operatives were among the lowest in Japan.” Tussing, A., (1970) pp. 215-16.

³⁵ Scranton (1985) p. 41.

machinery.³⁶ (And over the middle run, no sooner did Japanese entrepreneurs become engaged in mechanized cotton and silk reeling than did those industries become less profitable and low tech, with Japan stuck in semiperipheral activities of the world-economy—until after World War II when the Cold War altered Japan's strategic importance to the US.) The Japanese population of this era did not have the income to purchase silks produced using the costly and advanced machinery, unlike the income of the budding US middle class. Perhaps Japanese entrepreneurs could have bought the high-tech spinning machinery and made profits as an export (to core)-oriented industry. However, access to the US market was restricted by the very high protectionist tariffs in the US and in Europe on silk goods except, of course, raw silk, which Japan already produced in large quantities. Japanese entrepreneurs simply did not have access to the consumers of finished silks abroad to make investments in mechanized silk machinery profitable. In short, given the exiting global disparities of wealth and power, Japanese producers had little choice but to engage in other sectors of the world division of labor, if they were to do so at all. When we speak of relatively different “entry costs” then, we really refer to the entirety of historical developments and structures behind global inequality as manifest in a particular circumstance of structural constraints on groups.

MARKET PRICES AND VALUES SHAPED BY PRODUCTION RELATIONS

The US bottleneck was a two-sided market relationship among buyers/users of raw silk and the producer/sellers of raw silk. On the one hand, mechanized raw silk production in the US presupposed the availability of cheap raw

^{36.} In addition to several examples of bankruptcies among the private and state run firms which imported silk reeling equipment from Europe, there were attempts to import a cotton spinning mill, as Smith explains: “There was but a single privately owned spinning mill built [assembled] in Japan before 1880, and the difficulties experienced suggest why. The founder of the mill, a Tokyo merchant, ordered machinery for it from the United States in 1864. The machinery arrived in Japan in 1867, but the difficulties in assembling the machinery, learning to operate it, and training a labor force delayed the beginning of production until 1872. Even after production began, there were continuing technical difficulties that, *together with competition from imported yarn*, kept profits low. In 1878, the best year before 1880, the mill showed only a 5-percent profit, or about half of the current interest rate on loans. When one considers that the capital invested in this mill yielded nothing from 1867 to 1872, and that investment in machinery entailed far greater risks than other types of investment, it is no wonder others were less venturesome than this Tokyo merchant” Smith, T. C. (1955) p.39.

silk—raw silk at a price low enough to make mechanized production profitable at a given level of productivity, price of entry, and price at sale. However, once established, the very productivity and oligopolistic nature of mechanized US sector(s) additionally contributed to the price-reducing market pressures on raw silk producers in Japan. As suppliers of a semi-finished good in a division of labor, the various producer/sellers of raw silk were effectively “locked into” selling their product through merchant mediators to the limited number of US producers, as opposed to selling to a larger number of buyers. That is, prices are not determined only by the number of sellers in a market. Price theory involves both supply and demand curves. Leaving aside the historical mediation of states and cartels, the relative number of buyers in a market (relative to the number of sellers) fundamentally affects market price. Price-reducing pressures on raw silk in the Japan–US network became greater by virtue not only of the relatively large number of producer/sellers of raw silk, but also the relatively fewer number of purchasers (cum manufacturers) of raw silk.

The great productivity and the high entry costs of mechanized silk production, which limited the numbers of entrants, gave US producers oligopolistic or “bottleneck” price-reducing power in the input market for raw silk. Furthermore, as relatively oligopolistic producers of raw silk, US silk manufacturers were also relatively oligopolistic sellers to numerous consumer-buyers. They benefited from competition among buyers that moved prices on finished goods upward. In fact, some large Paterson firms maintained their own sales staff during this period.³⁷ Moreover, unlike international raw silk merchants, US silk manufacturers gained oligopolistic end-sale power over prices from the tariff protections imposed on imported finished silk goods. This condition, which lasted until the industry became saturated with producers during the early twentieth century, suggests that rather than a “bottleneck” the division of labor and markets of the network may be more accurately envisioned as an “hourglass.” And the hourglass structure was evolving. Competition intensified as production grew across the network, in particular, at the wide end. In a vicious cycle, growing productivity in the US sector begat growing competitiveness in the Asian raw silk markets as the number of raw silk producers increased to meet rising US demand. Thus, increased productivity and absolute production growth among US producers, which was based in part from previous profit earnings made from low priced raw silk, put additional downward pressures on raw silk through markets thus structured by the interstate division of labor.

^{37.} McLewin, Philip, J. (1985) p. 138.

The superior remuneration to producers in the mechanized segments of the network in the US derived not only from greater productivity (surplus value creation), but greater productivity enabled relatively few enterprises in that sector to purchase and process large quantities of raw silk produced by a large number of producers. The ratio of few purchasers, which derived from the integration of specific forms of production and class relationships, translated into oligopolistic price-reducing market power for buyers, while the relatively large number of raw silk producers translated into additional price-reducing competition.

In this way, markets were structured by the forms of the division of labor. The articulation of the forms that structured the markets created unequal exchange—the domination of class relationships in the industrial production relationships over less productive forms. Market pressures consequent to the specificities of the axial division of labor lowered the prices of raw silks (labor) below their value and also overpriced US labor above its value, both as obtaining through currencies. In other words, at the point of interstate exchange, the low price of raw silk reflected a “de-valorization” of the exchange-value of embodied labor. Despite the existence of merchant and production cartels, the value of Japanese raw silk was not fully valorized in Japan. The buyer of raw silk gained a greater magnitude of value than was represented in the quantity of money given in exchange. The expansion and profits of mechanized silk production in the US was thus based not only on greater productivity and labor exploitation within US silk factories (the appropriation of greater and greater surplus value), but this also enabled the expropriation of value subsidies from inputs as manifest in the low price of raw silk, which was fully valorized, along side surplus value, at the point of sale in the consumer market.

UNEQUAL EXCHANGE AND GENDER

I. Paterson’s Gendered Centralization and Decentralization

The evolution of Paterson’s silk industry from a silk thread manufacturing center prior to the US Civil War to a decentralized and highly productive regional weaving and dyeing industry following the war, involved the dynamic interplay of patriarchy, class, ethnicity, ideology, and geography that was part of the historical process of unequal exchange in the Japan–US silk network.³⁸

³⁸ Scranton notes for example that, “[T]he potential for labor unity was obstructed by antagonisms along lines of ethnicity, sex, skill, and ideology ...[For example,] The appeal of the Knights of Labor for a universal silk-trade union withered when

In 1860 Paterson was home to six silk companies devoted to sewing silk manufacture. With the transplantation of the British industry to the US, 1865–1880, and the influx of European workers, broad-silk weaving quickly became the dominant sector of silk production in the city. Factory owners purchased thrown silk, hired workers to prepare the warps and operate power-loom, and sold the woven broad cloth to finishing firms, wholesalers, or directly to retailers. The large integrated factories that arose focused on broad-silk weaving and dropped internal dyeing almost entirely.

From the early 1880s large firms also began to build throwing and plain-silk weaving annexes in northeastern Pennsylvania cities, including Allentown, Boonton, Harrisburg, Hawley, and Honesdale to take advantage of unorganized female and child workers.³⁹ The drive to mechanize operations in Paterson and relocate simpler and labor intensive procedures outside the city was a process of decentralization and was based on the gendered class relations within and outside Paterson.

By 1892, more men were employed in the city than women, reversing the earlier pattern of female predominance. During the last ten years of the century, male employment in Paterson rose overall by about seventy percent, while female employment rose only forty percent.⁴⁰ The core sector of skilled-male workers thus became concentrated in Paterson while in surrounding towns of Northern Pennsylvania semi-skilled female workers labored in the numerous scattered annex operations. Patriarchal centralization-decentralization was a global process, not just local, as it was premised on the inflow of cheap medium quality raw silk from Japan and the radical transformation of the Japanese silk industry that made the raw silk less and less expensive.

ethnic and skill issues surfaced. ‘English speaking’ ribbon weavers let it be known that they would ‘never join any body that includes the German, French and Italian weavers’ and that ‘weavers in general’ were ‘averse to being joined to several thousands of inferior workers.’” Scranton (1985) p. 63.

³⁹ “Catholina Lambert, a Yorkshire immigrant, pioneered the shift of throwing operations to northeastern Pennsylvania after building a throwing mill in Hawley in 1880.” Scranton, (1985) p. 5. “In 1912, Paterson had lost seven mills and Pennsylvania had gained fifty-three” and as “1913 began, there were a total of 293 silk mills in Paterson and 473 in Pennsylvania.” *American Silk Journal* 32, February, 1913:79, cited in Golin, (1985) p. 93.

⁴⁰ The percentage of men employed in Paterson rose from 47.5 percent in 1890 to 55.3 in 1901. Scranton, (1985) p. 56.

Among the key reasons owners would relocate outside Paterson included labor disputes led by increasingly organized workers, attendant rises in wages, and attempts to keep women out of jobs that men held. There were numerous reversals and counter-reversals in the employment of women in the different processes of silk production. From Paterson's early days, firms had employed women locally for certain work. Hand warping during the 1860s, for example, was known as "women's work" in factories and home-shops. However, when factories invested in new power-driven warping machines during the 1880s, they hired men to operate them. But as the wages of organized male workers increased, "within a few years...manufactures again employed some female warpers to avoid dealing with unionized men."⁴¹

Male workers vigorously resisted the encroachment of women workers, and the gender dimensions of class conflict became an essential characteristic of many Paterson labor conflicts. Scranton touches on the essential patriarchal-corporatist features of male workers' resistance in Paterson and how, ironically, it led in some cases to demands by men for equal pay:

Though women workers were often valiant strikers [and strike-breakers] ... they were voteless, excluded from political debate, and generally ignored by union organizers. When manufacturers tried to take advantage of a labor market divided by gender by opening skilled jobs to women at half the rates paid men, male workers acted to prevent this incursion. On one occasion they made the simple and crippling demand that women's pay be the same as theirs. Far more frequent were strikes to exclude women entirely or, if that did not succeed, harassment and intimidation were used to force them to quit.⁴²

One critical area of silk production where women did not make inroads was dyeing. In 1860, the first silk dye works established in Paterson employed six hundred workers, four-fifths of whom were women and girls.⁴³ But over the next thirty years, the silk industry nearly became an "all-male" bastion of skilled laborers. Several factors came into play to make Paterson dyers among the most powerful workers in the silk industry. For one, their scarcity as highly skilled workers (human capital) had depended in part on excluding women from joining their ranks. Another advantage was locational: dyeing had become concentrated in Paterson due to the unique water of the Passaic river running through the city. Dyeing operations thus could not easily be moved outside Paterson as other sectors could and were.

^{41.} *American Silk Journal* 4 (1885) cited in Scranton (1985), plate 14.

^{42.} *American Silk Journal* 4 (1885) cited in Scranton (1985), p.64

^{43.} *Ibid.*, p. 3.

Adding to their market power, Paterson dyers in 1886 broke with the city's theretofore pattern of non-union protest and joined one of the most feared national unions in the country, the Knights of Labor. When they went on strike in 1887, silk production in Paterson literally came to a halt (and if such disruptions continued for a sustained period of time, they would have affected sericulture and reeling in Japan.) Some twelve thousand workers throughout the city were temporarily dismissed. Some owners probably dismissed their workers not to prevent excess inventory, but to engender resentment by other workers against the dyers.

The relocation to annex facilities was partly stimulated by, and an effort to compensate for, the higher wages paid to male dyers and the costs of work stoppages throughout the region. If the dismantling and decentralization of large factories in the city contributed to undermining the power of organized and scarce male workers—who over time came to work in smaller firms or household-run facilities—it was also fundamental to the gendered character of the regional decentralization of the silk industry. Paterson owners sought to overcome higher wages and control of production which essentially meant overcoming male worker power and the "new tradition" of protest in Paterson.

Frequently worker's demands for wage increases were acts of "catching up" because they occurred after wage reductions that were caused by instabilities characteristic of the silk industry. The instability of raw silk supplies and prices, elasticity of demand, and rapidly changing styles, which stemmed from the social relations of production in the less productive sectors in Japan, caused US industry production levels, revenues, and remuneration to fall dramatically in some years. Wages among local throwsters, for example, dropped about ten percent on average during 1884. When business picked up in March the following year, winders and doublers at Louis Franke and Company struck for an advance of seventy-five cents per week, raising their wages from \$4.75 to \$5.50 per week, about five percent higher than 1884 rates. Their success, according to the *American Silk Journal*, set off a general demand for higher wages in nearly every throwing establishment in the city, with the result that in most instances wages were raised to \$5 among some 1,500 non-union spinning mill workers. This prompted owners, in the short run, to cut wages and close shop for days. In the summer of 1885, following the March strikes, business slumped and owners cut wages. Then in early 1886 the industry was busy again and factory hands worked overtime. Workers called for rate increases to offset the earlier reductions. Several large firms agreed to the demands, but some refused and strikes involving 230 broad silk weavers commenced, and workers won wage increases once again.⁴⁴

^{44.} *American Silk Journal* 4 (1885) cited in Scranton (1985), pp. 41, 55.

In the typical pattern of industrial expansion and innovation,⁴⁵ the combination of growing US consumer demand for silk products and the growing power of Paterson's workers led factory owners to invest in labor-saving and skill-reducing mass-production machinery, which in turn created new gendered class contradictions and antagonisms. The owners' efforts to take advantage of the more productive equipment were met with resistance. For example, to maximize the advantages of new weaving machinery, workers were called on to operate two looms at once. As McLewin explains, from the early 1880s to the great strikes of 1913, "The number of looms assigned to each weaver was the most important issue in the struggle for control of the labor process."⁴⁶ In 1883, for instance, weavers struck at two companies that increased loom assignments. No doubt, many of the forms of sexual harassment and discrimination among Paterson's textile industry were patterns brought from Europe. Unionized male workers in cotton factories of Manchester, for example, created 'female morality' issues to retain higher skilled jobs for themselves and exclude women workers, who, being paid lower wages, set unwanted precedents and engendered conflicts.⁴⁷ In Paterson, in late 1890, female ribbon weavers at Levy Brothers struck against having to produce "as many yards as a male weaver at about half the male weavers pay." The union women won their battle for equal pay, but did so by defeating non-union women, and themselves engaged in sexual harassment in the struggle. According to the *American Silk Journal*, a "female 'scab' was nearly disrobed, piecemeal, on the street, and chased, *en déshabillé* across Arch Street Bridge by a howling mob" of women ribbon weavers.

As a few women made inroads in the weaving sector, they also had to battle owners. The replacement of men with women workers naturally gave rise to new class-patriarchal types of conflict. In one case, Joseph Bamford, partner of a large weaving firm, assaulted a young employee when he dismissed her for being

⁴⁵ Braverman, Harry, *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century* (1974, New York: Monthly Review Press) is the classic analysis of deskilling. See also, Kasson, John F. (1976) *Civilizing the machine: technology and republican values in America, 1776-1900* (New York : Grossman Publishers).

⁴⁶ McLewin (1985), p. 137.

⁴⁷ "In late 1886, 170 male hands ...struck at a Thomas and Joseph Heaton mill ...[objecting] to the presence of three women recently hired as spinners ...on the grounds of morality and decency. The question of scanty clothes in the hot, humid atmosphere of mule spinning rooms and also the bodily postures required by the work figured prominently in the debate that followed." Lambertz (1985), p. 43.

absent from work. He was tried and convicted in court, which prompted other women workers to speak out about his abuse. It was reported that "assaults were committed on other occasions, but that the girls were afraid to make complaints before the courts."⁴⁸ Apparently workers responded with greater violence to this incident than ever before: Bamford's mill and home mysteriously burned down in December.

As with dyers, organized men in other areas of silk production also resisted the hiring of non-union workers, particularly if they were women. In September, 1886 eighty union ribbon workers walked out of the Pioneer Silk Manufacturing Company when the owner hired a nonunion weaver. The owner, Thomas Ryle, fired all eighty union workers and replaced them with female-trainee strike breakers. At the end of each day, the union men jeered the women all the way to their homes. "Some evidently quit, and the firm escalated its challenge by shipping a number of looms to its annex at Allentown, Pennsylvania" where non-union women and children workers could be hired without incident.⁴⁹ That was after female-decentralization and male-centralization of production in the region began.

Because large integrated firms could not avoid the strikes, worker stoppages or the high wages of skilled male workers, they increasingly subcontracted some work to smaller specialty firms and concentrated on low-skilled high-technology activities which they could move out of the city where they could hire women and children at very low wages. The large companies in Paterson were eventually displaced by the smaller, more competitive, male-predominant firms and household enterprises. As Scranton explains, "Silk manufacturing in Paterson thus gradually evolved away from the integrated factory toward a Philadelphia-style system of interlocked and versatile specialists arrayed around central weaving shops of widely varying sizes."⁵⁰

⁴⁸ *American Silk Journal* 9 (1890), p. 295; 10, (1891), p. 91. Cited in Scranton (1985), p. 62

⁴⁹ *American Silk Journal* 4 (1885) cited in Scranton (1985), p. 59

⁵⁰ Scranton (1985), p. 45. By 1916, "Though many Paterson firms had moved all or part of their operations to Pennsylvania, silk remained the city's predominant industry, with almost 26,000 of the city's 41,816 wage earners being employed in silk manufacturing or dyeing. The largest sector of the Paterson silk industry was broad silk, which employed close to 15,000 of the city's silk workers. Well over half of these employees were weavers, since throwing was concentrated in out-of-town plants. Broad-silk mills varied widely in size. A large number employed fewer than twenty persons and resembled a cottage industry, with operations often carried out in the owner's home. Over 150 mills

The Pelgram and Meyer Company in 1880 pioneered the decentralization strategy when it relocated silk-throwing operations to a separate plant at Boonton. The yarn from the new plant was shipped to Paterson where skilled workers finished the product. This proved to be quite profitable and so the firm rapidly expanded over the next several years. By 1882 the company employed 1,200 workers who operated 310 power looms and 22,000 throwing spindles at both sites.⁵¹ It was reported in the *American Silk Journal* that 1885 profits from Pelgram and Meyer's Boonton annex "footed up a round \$100,000 ... which is attributed mainly to the lower wages paid in the town where it is located."⁵² From the 1880s many other Paterson proprietors began moving their twisting, lacing, and high-speed plain-silk weaving equipment to annexes where they hired women and, for example, children of local miners. Women and children workers protested less, were easier to control and supervise, and of course worked for lower wages.

Theoretically, this sudden lowering of the price of labor, even in the absence of increased productivity (surplus value), is a prime example of how firms lowered the price of labor below socially necessary labor time and value, as discussed earlier. Historically, as in Japan, competition in one area spread to others even though production may not have been as productive. This in turn transformed the social relations and conditions of production, forming a new terrain upon which class struggles ensued.

Decentralization pitted workers in the productive annexes against those in Paterson who performed the same tasks, through regional market mechanisms. As the price of throwing, for example, declined in the annexes, pressure was put on Paterson firms to match the lower price or lose business. In 1885, Paterson rates for throwing organzine (hard-twisted *welt*) and tram (soft-twisted warp) "were \$1.00 and \$.55 a pound, respectively, though cost estimates were about a third less for the major [proprietors] who had built annexes and used 'cheap' labor. By 1890 competition brought the rates down to \$.75 and \$.45."⁵³ The lower prices in turn put pressure on owners to lower wages of Paterson's workers. Consequently, a regular if not predictable pattern of class conflict came to characterize the silk industry in Paterson throughout the late and early twentieth

employed from 20-100 workers and about 25 mills employed 100-400 workers. The only really large broad-silk mill [remaining] was owned by Henry Doherty, who employed six hundred workers at his main plant." Goldberg, (1985) p. 107.

⁵¹ O'Donnell, Patricia (1985) p. 101.

⁵² *American Silk Journal* 5 (1885), p. 30 cited in Scranton (1985), p. 39.

⁵³ Scranton (1985), p. 46

century. When Rayon, an activity monopolized by the US for some time, was invented the Japan-US silk network was eventually destroyed.

II. Class-Patriarchal Relations of the Japanese Reeling Industry

The rise of Paterson's silk industry required the radical transformation of silk production in Japan. However, the strategy of Japanese entrepreneurs to increase production and profits proceeded through an opposite spatial strategy of patriarchal labor control. Whereas Paterson owners had to circumvent existing male labor control and establish female and child relations of production, Japanese mill owners did not. The raw silk reeling workforce in Japan already was composed of women almost entirely. Instead, Japanese owners had to overcome the existing forms of raw silk production—the day-labor form, which itself was recreated anew as a result of the expansion of exports. To overcome this form, mill owners eventually *centralized* raw silk production. Thus, the expansion and increasingly low price of Japanese raw silk and conditions of unequal exchange was a process not only of market forces and state policies, but also of local contingent patriarchal-class relations.⁵⁴ Indeed, it is our thesis that the network could not have functioned, and would not have expanded as rapidly as it did, in the absence of the remaking of the patriarchal dimensions of silk production throughout its various sectors.⁵⁵

⁵⁴ Mies' comments that "the concept of 'patriarchy' was re-discovered by the new feminist movement as a struggle concept, because the movement needed a term by which the totality of oppressive and exploitative relations which affect women, could be expressed as well as their systematic character. Moreover, the term 'patriarchy' denotes the historical and societal dimension of women's exploitation and oppression, and is thus less open to biologicistic interpretations, in contrast, for example to the concept of 'male dominance.'" Mies (1986), p. 38.

Sayer's critique is also germane: "To acknowledge the patriarchal dimension of a given set of production relations, conceived as those relations necessary to a mode of production of material goods, is not to explain patriarchy itself. I reject the view—advocated by some Marxist feminists—that patriarchal relations can be explained with reference to their economic functionality, on both theoretical and empirical grounds. The burden of modern feminist argument is rather to suggest an independent (if very material) basis for age and gender relations which is the particular concern of feminist theory ..." Sayer, Derek (1987) p. 81.

⁵⁵ As Karen Sacks argues, "The point of all this is that one should not expect to find any generic worker or essential worker, or for that matter, working-class consciousness; that not only is class experienced in historically specific ways, but it is also experienced in racially specific, gender-specific, and kinship specific ways. The big issue is how

Patriarchy enabled Japanese owners to reduce the price of labor-power dramatically, even below subsistence. Not all analysts recognize this. Sugiyama, for example, underestimates the significance of low wages in Japan by arguing that “Since wages for female workers constituted only 4-5 per cent of total costs, the importance of low wage labour should not be allowed to overshadow the role of low cocoon prices.”⁵⁶ However, low prices of raw silk stemmed largely from the low labor costs of producers, whether that was manifested in the products of wage-workers or cash-crop peasant producers. Precisely because of intense patriarchal exploitation, the wage bill for Japanese mill owners could be kept down to only four or five percent of costs. Wage levels could be kept so low because mill workers were really “semi-wage workers” by comparison to Paterson wage-laborers: the reproduction of their labor-power did not depend upon their wage income. Workers did not buy the necessities they needed with their wages, and probably could not have afforded to. Their subsistence necessities were largely provided by goods produced by non-waged household members. The mill workers’ income contributed to household subsistence and status, but the household was not dependent upon it. This form of patriarchy worked against the interests of mill owners, and it was eventually overcome by them as extending rural landlordism and debt to money lenders drove peasants to increasingly rely on the wages of women workers to maintain their landholding status.

The mill owners’ reliance on female peasants from nearby towns presented advantages and disadvantages which conditioned the very development of raw silk production in Japan, and in turn, the entire Japan-US silk network. When the new factory filatures were established during the 1870s Meiji mill owners took advantage of existing patriarchal norms, including the customary division of labor in which silk reeling was “women’s work” and in which women’s labor was socially valued below men’s, as manifest in the price of women’s labor. That is, existing patriarchal norms enabled owners, whether male or female, to pay women workers less than if they had hired men. In fact, Japan’s first factory work

to go about finding the unities and commonalities of class and class consciousness while being attentive to specificity”, Sacks, Karen B., (1989) “Toward a Unified Theory of Class, Race, and Gender” *American Ethnologist*, p. 542-3. Maria Mies makes a similar argument, Mies (1986), pp. 38-9, see also Acker, Joan (1988) “Class, Gender, and the Relations of Production,” *Signs* 13: 473-97. Also see how Ann Stoler constructs her historical analysis in “Carnal Knowledge and Imperial Power: Gender, Race, and Morality in Colonial Asia,” *Gender and the Crossroads of Knowledge: Feminist Anthropology in the Postmodern Era* (University of California Press, 1991).

force was composed mostly of women, not men. It was in this period that the modern day-laborer (*hiyatoi rōdōsha*) reeler (who produced raw silk for Western factories and consumers) first came into being in Japan. Overall, in the new filatures of the 1870s and 1880s female work became more regimented, intense, and dangerous. More women worked longer hours and more days of the year and became more concentrated within the cramped and stultifying walls of the increasingly larger and more impersonal mills. And as the number of women commuting from villages to mills increased, so did the number of rapes and robberies inflicted upon them by men. Thus men took advantage of women workers not only as workers, but as women too.⁵⁷

Life outside mills was less conducive to collective resistance than for US male workers in Paterson, New Jersey, and this is another reason for their low wages. Women reelers in Kōfu during the 1870s and 1880s—prior to the creation of “dormitory workers”—were mostly commuting day-laborers who rushed home to their own villages after reeling to gain subsistence and perform household work. Social life outside the mill was distinct from their employment. In contrast, in Paterson workers enjoyed “fraternal paternalism” which established social ties among workers and employers during their leisure time. For instance, in November 1884 Alfred Crew, a British entrepreneur from Macclesfield, provided various forms of complimentary entertainment to his employees. “Such festivities,” observes Scranton, “along with Christmas treats, summer excursions and baseball contests among mill teams, were regular features of Paterson factory life, even in years of turmoil.”⁵⁸ Really, these newly invented customs of cooperation constituted a complex relation of fraternal patriarchy designed to lower

⁵⁶ Sugiyama S. (1988) p. 124.

⁵⁷ “Factory girls may have been familiar with blows and brutality before they reached the mill. Yet when a supervisor chastised one of them, the humiliation of public shame inflicted by a stranger must have added greatly to the very real bodily pain of the beating. Although rape and other forms of physical assault were not unknown in village life, in the mills women and girls were especially vulnerable to sexual attack or seduction. Away from supportive families and familiar surroundings, often lonely, disciplined harshly, caught up in the dehumanizing routine of racing machinery, youngsters were hungry for any sign of affection or gesture of kindness.” Tsurumi, (1990), pp. 165-6. See also the classic work on this subject, Hosoi Wakizō (1954), *Jokō aishi* (The pitiful history of female factory workers) (Tokyo: Iwanami).

⁵⁸ Scranton (1985), p. 37. See also *ibid.*, p. 60, and his article, “Varieties of Paternalism: Industrial Structures and the Social Relations of Production in American Textiles,” *American Quarterly* 36 (1984); 235-57.

worker costs by heading off worker dissent. Mill owners in Japan also invented instrumental paternalist customs. They were not as lavish, for profits in the more competitive sector did not permit it. Rather, they were blunt, including, for example, loans to workers. However, such paternalist actions could backfire and stir up dissent among workers. In fact, the first recorded factory strikes in Japan, in Kōfu in 1885—just months after the Chichibu rebellion—were triggered by just such a paternalist custom gone awry, as we shall see in the next section.

Nonetheless, as day-laborers, Japanese reelers during the mid-1880s had a few structural-market advantages on their side. The day-labor form of employment set limits on the rate of exploitation by filature owners because the available labor supply was limited to those who could commute to the mills. The mobility and *relative* scarcity of skilled reelers provided reelers with certain bargaining power, such as the ability to receive their wages at the end of each day rather than monthly. Owners complained to local officials that workers who were unhappy simply quit after getting paid and gained employment at another mill the next day. Owners clearly knew that they competed among themselves to obtain workers, and that workers played one employer off another by switching from one to another who provided higher wages and better working conditions. It was because owners now competed in a world-market to sell raw silk that the pressure to reduce costs, and gain control over the market for labor, was greater than it had ever been within the Tokugawa social system.

Initially mill owners responded to the local market power of day laborers by forming local associations or cartels. They aimed to end the free mobility of the day-laborer by binding workers to a single firm and made agreements to control wage rates, speed up the work pace, and stretch out working hours. It is significant that some of these local associations were established under the auspices of the government Silk Manufacturing Industry Alliance (*Sanshi Sangō Kumiai*).⁵⁹ This national organization was established in 1884 by the Meiji government to help manufacturers and merchants recover from the effects of the Matsukata deflation and to improve the quality of raw silk exports. Merchants and producers established local branches to coordinate with the central headquarters to regulate sorting and raw silk production quality. However, top businessmen of the Nagano and Yokohama branches strongly opposed government attempts to regulate the industry. The real significance of the Alliance and branch organs was

^{59.} Yoneda (1956) p. 79. On the alliances formed during the early 20th century, see Ishii, K. (1972) pp. 277-90.

primarily in the appropriation of its authority by manufacturers to organize their local employer cartels.

It was when Kōfu manufacturers formed such a cartel and tried to implement a city-wide labor contract system, that workers began a series of strikes in 1886. The employers succeeded. However, world competition was intensifying and the contract system was limited in its effect. It simply could not resolve the underlying problem of worker scarcity which was rooted in the commuting day-labor form of production. More drastic measures were required to expand the labor force and gain greater price-reducing and patriarchal control of silk reelers.

Such drastic measures were initially taken, and ushered in the second phase of the Meiji reeling industry's expansion, when silk capitalists circumvented the day-labor form by establishing the dormitory-system of employment during the 1890s. Housing reelers in company dormitories dramatically expanded the available supply of workers because workers could be recruited from throughout entire regions. The dormitory system spread rapidly and underpinned the expansion of Japan's entire textile industry. Women remarkably continued to comprise the majority of the country's factory working class—sixty-two percent before 1910. This was nearly twice the percentage of women factory workers in the US and France at the turn of the century.⁶⁰

The dormitory system gave vast new power to mill owners by expanding the supply of workers and consequently heightening competition among workers for jobs. The bargaining power that the comparatively scarce day-laborers previously enjoyed was eliminated. The new female migrant worker—the *dekasegi* (lit. “work away from home”)—signed a contract with one mill owner and lived twenty-four hours a day under the strict control of his managers. Workers could no longer easily leave a mill where working conditions were harsh to work for another employer. And the terms of the workers' contracts were enforced by police and local employers' cartels whose members agreed not to hire each other's employees.

Mill owners lengthened the worker turnover period from days (or months) to months and years and limited trips outside the dormitories. But women were often too exhausted to do anything but sleep after working six or seven days a week, fourteen hours a day. Further, the dormitory system also created new

^{60.} According to Gary Saxonhouse, in 1909 62 percent of all factory workers in Japan were women, compared to 32.6 percent in the US (1900) and 31.5 percent for France (1901), 37.4 percent for Italy (1901), 23.9 for Belgium (1900). Saxonhouse, Gary, R. (1976), p. 99.

social spaces for men to make women the targets of sexual conquest. Inside the mill women faced the sexual attacks or advances of supervisors; outside the mill they faced rape by the recruiters who brought the women to the mills from rural areas.⁶¹ For filature owners, reelers became nameless, faceless, expendable instruments of capital accumulation and targets of sexual abuse.

DAY-LABOR: STANDING IN THE WAY OF “PROGRESS”

Yamanashi prefecture had been an area of concentrated commodity production since the middle-era of the Tokugawa society-system. However, as part of the formation of the Japan–US silk network, Yamanashi prefecture became one of several dense “new filature” areas of the Kantō region in central Japan. It differed markedly from the small producer sericulture areas where many peasants reeled poorer quality silk in their homes, such as in Chichibu district in Saitama prefecture.

Silk production was extremely concentrated and specialized in the new filature areas like Kōfu. In 1885 about two-thirds of all goods sold in Yamanashi were silk products—cocoon, raw silk, and kimonos.⁶² Most of the silk goods were produced in just four of the prefecture’s rural nine districts (*gun*). And among these four rural districts between seventy and ninety percent of peasants and small proprietors engaged in sericulture. And just two of these four rural districts produced ninety-four percent of the entire prefecture’s woven silk goods. But there was one extra-exceptional district not among these four: the urban Nishiyamanashi district.

While the former two rural districts plus Nishiyamanashi produced 84 percent of all raw silk in the prefecture, Nishiyamanashi stands out as an exception. Most production from Nishiyamanashi district came from the city of Kōfu. Like the Suwa district in Nagano prefecture, Kōfu was had become a highly special-

⁶¹ “[T]he reality of the environment in which women were recruited and worked made them extremely vulnerable to harassment and sexual violence of various kinds. According to Hosoi ...recruiters routinely raped or compromised the young women they were escorting to the mills. *Shokkō jijō*, vol. 1, has numerous references attesting to the fact that male floor supervisors had absolute control over the women working on their shifts, and that during night work they often treated these women as a private harem. In larger companies, the floor supervisors recommended bonuses, reported tardiness, docked workers’ pay for various infractions, and ultimately decided how long the shift would be. It was extremely important for women working with these men not to displease them.” Sievers (1983) pp. 210-211, fn. 34.

⁶² Yoneda (1956) p. 70.

ized silk manufacturing center.⁶³ In 1879, there were eighty mills in Yamanashi prefecture, the third highest number for any prefecture in Japan.⁶⁴ By 1885 the number of mills in the prefecture grew to 188, and, by far, the most productive and largest of these were in Kōfu. (By comparison to peripheralized sericulture districts like Chichibu, the number of mills in Yamanashi prefecture was huge). But even more impressive, by 1883 more than half of the entire prefecture’s raw silk output came from the large Kōfu mills.⁶⁵ They were not only larger in size, but operated more hours per day, more days per year, and even began to break the pre-established seasonal rhythm of production.⁶⁶ Early on the prefectural government in Yamanashi played an important role in facilitating the expansion of raw silk production. Supplied with funds from the central government, during the mid-1870s the prefecture made loans to local entrepreneurs for land reclamation projects to increase mulberry leaf output and also built a large technically advanced filature for entrepreneurs to model their own after.

During the mid-1880s, Kōfu mill owners were frustrated by the short supply of local reelers. The supply probably had peaked during the early 1880s when the Matsukata deflation struck and pushed local poor peasants into tenancy and in turn into the filatures for cash to repay loans and taxes. Indeed, a local journalist observed conditions in Kōfu that were similar to those in Chichibu: “Everyday half the newspaper reporters’ announcements are filled with stories of land forfeitures.”⁶⁷ Yamanashi officials noted what we today call the “dissolution of the peasantry”: “In the generally pervasive great depression, the working world has undergone great change. There has been a sudden increase in those trying to eke

⁶³ Ibid., p. 71

⁶⁴ Ishii (1972) *Nihon sanshigyō shi bunseki*, p. 129.

⁶⁵ Among all filatures in the prefecture employing between 50-100 workers, 73 percent were concentrated in Nishiyamanashi district (Kōfu). More impressive, about 47 percent of all mills in Kōfu employed at least 50 workers in 1883 by comparison to a mere 7 percent of mills in the other districts. Most impressive of all is the output of the Kōfu mills. In 1885 the number of Kōfu mills (48) accounted for only 25 percent of all mills in the prefecture (188). But these 48 mills produced 60 percent of the prefecture’s entire raw silk. The average output of the Kōfu mills amounted to 1,845.3 *kin* (1 *kin* = 600 grams) per factory, while the average output per factory in the other districts totaled only 434.4 *kin*. Yoneda (1956) pp. 72-3.

⁶⁶ Seventy-one percent of Kōfu mills operated more than 150 days a year whereas about 80 percent of the mills in the rest of the prefecture operated less than 150 days a year (and of these more than half operated less than 100 days a year). Ibid., pp. 72-3

⁶⁷ “Kōgyō iken” vol. 7, *Meiji zenki saisei keizai shiryō shūsei*, vol. 18, p. 823, cited in Yoneda (1956) p. 78.

out a living as factory women.”⁶⁸ The local supply of reelers thus increased; but not enough to bring down wages as low as mill owners desired. Government officials were sympathetic. The following exaggerated government report, for instance, tells of the women reelers’ power and reflects the frustration of local capitalists:

From Meiji 13 [1879] the [silk reeling] mechanisms [filatures] increased and the shortage of factory women became an extremely serious problem. The reason: it is not the custom in this prefecture for factory women to live in factory dormitories, so they all commute to work. Rather, it became an indulgent custom of factory girls to work in one reeling mill today, and tomorrow to work in another. Even if a factory woman misbehaves the factory doesn’t have the right to censure her; if the factory censures her, she already has plans to go to a different factory the following day, so censuring her has not the slightest effect. As a result, the attitude of factory girls to factory owners is very unfriendly and one can see that the employer is, on the contrary, dominated by the factory women.⁶⁹

A prefectural report of 1881 similarly reported that,

Due to the recent shortage of factory women one can see there are now severe problems in Kōfu and neighboring villages ... Even though faced with an insufficiency [of reelers], new reeling mechanisms are constantly being established. From the start, the new founders make no preparations to hire women. To cope with the situation they secretly plan to steal factory women [from other shops....So factory women are happy to work in a shop with no rules. If the shop’s rules are strict and hated, they will quit tomorrow and go work in another shop].⁷⁰

THE 1885–86 KŌFU STRIKES: MILESTONES TO OVERCOME

The scarcity of reelers had thus forced owners to compete among themselves for workers, and evidently to complain to local authorities about it and to begin offering “paternalist” incentives to encourage workers to stay at their mills. But in the first known factory strike in Japan, in 1885, women workers complained about how such paternalism was implemented unfairly. At one mill they complained that they did not all receive the same loan amount and that the owner gave preferential treatment to unmarried reelers and to those considered

⁶⁸ *Yamanashi ken kigyō geppō*, vol. 5, no. 2 (September, 30, 1886), p. 2, cited in Yoneda (1956) p. 78.

⁶⁹ *Seishi shijun kai kiji*, cited in Yoneda (1956) p. 77.

⁷⁰ “*Nosho musho shirei*” (1881), cited in Yoneda (1956) p. 77.

attractive. Specifically, married reelers and other workers received only one-yen loans while the others received five-yen loans. The women workers’ complaints suggested that the owners were sexist and preferred to hire “attractive” and “available” workers. As a result, a number of women refused to work until all workers were treated equally. The owner tried to replace the protesting women, but the replacements lacked the necessary skills, and so the owner conceded to their demands.⁷¹ Unfortunately, little more is known about the strike. Unfortunately, their success and developing gender-class consciousness would be undermined.

After the incident, Kōfu owners took new and unprecedented steps to deal with defiant workers and the overall labor shortage. In February 1886, they and merchants formed the Raw Silk Business Alliance (*Kiito Eigyō Kumiai*) under the auspices of the government-sponsored national Silk-Manufacturing Industry Alliance.⁷² Filature owners in Japan generally opposed the regulations on the silk trade that the government sought to implement through the Alliance. But in Kōfu they made use of the Alliance’s platform and authority to establish their own Raw Silk Business Alliance as a means to implement a city-wide contract system that would end the reelers’ rights to move freely from one mill to another and force them to accept a fixed wage rate.

To the bylaws of the national organization, the Kōfu Alliance added numerous restrictive labor regulations. Tsurumi found that the local Alliance sought to unilaterally set wage rates each year and pay wages on a monthly rather than weekly or daily basis.⁷³ Further, Yoneda explains that Regulation #3 required factory women to work only at the mill where they previously worked most often. And in anticipation of any reelers who considered defying this restriction, regulation #5–6 stipulated that reelers could be dismissed at the “convenience of the employer.” But if employment was terminated “at the convenience of the factory woman” then no silk mill in Kōfu would hire her for six months. And if termination of the worker was a result of her “misconduct,” then all the mills would boycott her for an entire year. Regulation #15 gave employers the right to deduct and hold back 1/50 (one-fiftieth) of the reeler’s wages as forced savings,

⁷¹ Tsurumi (1990) p. 51-2.

⁷² Ishii, K. (1972) pp. 277-8. Yoneda (1956), p. 79. This is the Alliance’s title according to Yoneda. Tsurumi uses the same source but refers to the alliance as the *Seishi Sangyō Kumiai*. (Tsurumi, (1990), p. 52).

⁷³ Tsurumi, (1990) p. 52

another unwelcome incentive to continue at the same mill. Worst of all, Yoneda points out, were regulations for the establishment of a fine and reward system. Regulation #16, for example, stated that up to one month's wages could be withheld for infractions of various fines.⁷⁴

The implementation of the new regulations, backed by the government, took effect in mid-May, 1886. Following their implementation, the Yamanashi Daily News reported that significant changes had taken place, for example, at the Amamiya mill. Wages were reduced by a third, from 32 *sen* per day to 22 *sen* and workers were made to work 15 hours a day, starting at 4:30 A.M. and finishing at 7:30 P.M.

The new controls on workers triggered a series of strikes at five mills between June and August, beginning at the Amamiya mill which employed about 200 workers. According to a prefectural report, about 198 women left the mill and gathered at a local temple on June 12. After four days of negotiations, owners conceded only a one-hour reduction of work time to 14 hours per day, and the abolition of fines for arriving late. Little more is known about the other strikes. However, Kōfu strikers were unable to defeat the mill owners. In effect, this was the first major blow to the reelers' status and power as scarce day-laborers.⁷⁵

The establishment of the contract system, and later the dormitory-system, gave unprecedented control over workers by owners, which seems to explain why so few strikes occurred in the industry after the day-labor form of production declined. Nonetheless, among the few strikes that did occur, those by Kōfu women certainly stand out. Among the twenty known filature strikes between 1885–1900, more than half, thirteen to be precise, occurred in Kōfu. Three occurred in Gifu, one in Gunma, and three in Fukushima, that is, in areas where the dormitory system was less pervasive.⁷⁶ The paucity of strikes in Nagano—only three between 1885–1914, is testimony to the area which perfected and relied heavily upon the dormitory system.

In theoretical terms, the transformed and intensified patriarchal relations of raw silk production enabled Japanese mill owners to reduce the price of labor below the socially necessary time of raw silk production. The under-priced value of female labor provided mill owners with additional value which could be realized as profit when valorized upon exchange for money. However, the Japanese mills also faced intense price-reducing market competition in the world market

⁷⁴ Yoneda (1956) pp. 79-80.

⁷⁵ Yoneda (1956) pp. 80-1.

⁷⁶ Ishii, K. (1972) p. 357.

which prevented owners from valorizing most of the surplus value. It was passed on to the next buyer and eventually valorized down the chain in those sectors that held oligopolistic market power. The intense competition among the mills, as noted, was "passed back" to sericulturists, such as those in Chichibu.

THE CHICHIBU REBELLION: MONEYLENDERS, GAMBLERS, AND SERICULTURE

The worsening conditions of the petty sericulturists in areas like Chichibu were shaped by regional and global dynamics. State officials since the late Tokugawa era explicitly acknowledged the strategic importance of raw silk exports because they earned the government Mexican silver dollars which financed the purchase of Western military weaponry, machinery, and technology, including that for the improvement and expansion of raw silk production, such as through the establishment of the famous Tomioka mill (Ishii 1982). However, national development programs to advance Japan's integration into the world-economy also required development policies to cope with the attendant economic instabilities and difficulties. Increased taxation and fiscal retrenchment throughout the Meiji era had caused widespread peasant hardship and discontent. Partisan oligarchic political control also engendered resentment among elites and educated middle strata, even gamblers, who initiated a modern political movement for democratic government and people's rights, known as the Liberty and People's Rights Movement (Boles, 1998, cf. Vlastos 1995, Jansen 2000). To combat the social effects of its modernization program, the Meiji oligarchy imposed new "social development" policies of political oppression during the 1880s against dissidents, including peasants. In the face of worsening economic conditions caused by the modernization program, protests among peasants, activists, and outlaw-gamblers, among others increased markedly, and combined are known as the "incidents of intensified violence."

During the 1870s, unfavorable exchange rates, caused by the international weakness of the Japanese yen, and skyrocketing demand for Japanese silk resulted in unabated inflation. To remedy rising prices and the flagging national currency, the Meiji government's finance minister, Matsukata, initiated the infamous "Matsukata deflation" program in 1881. Prices of sericulture products—cocoon, mulberry leaves, egg cards, etc.—plummeted between 1881–86. Incomes among silk producing peasant households fell by nearly half, such that they had to sell forty-two percent more silk in 1885 than in 1881 to earn the same amount (Smith 1955: 81).

However, tax rates were fixed, and in the preceding boom years hundreds of thousands of peasant households had borrowed cash from local moneylenders in the expectation of continued growth. They were not fully aware of the ramifi-

cations of the new system of private property that the Meiji state had instituted, with the aim, in part, of increasing raw silk exports. Unable to repay their taxes or to repay loans for silk production and / or to pay taxes, creditors and officials as never before began to mercilessly expropriate the land and possessions of petty forfeiters through the new courts with the full aid of the police.

Facing disaster, peasants responded throughout Japan in the mid-1880s by forming “poor people’s parties”—the title revealing a novel combination of the nomenclature of the new political parties and customary peasant petition methods. The various poor people’s parties initiated petition campaigns and collective requests for debt relief from lenders and authorities. When the powers-that-be refused to make concessions, peasants typically went bankrupt and lost their land and possessions. In 1883 the recorded number of peasants taken to court was 33,845, a figure that shot up to 108,050 in 1885. About 400,000 households lost land in 1884 alone, more than any other year of the Meiji era (Irokawa 1966: 353). As noted earlier, Kōfu prefecture officials believed that the dissolution of the peasantry in their area led peasant women to seek work in the mills. Such local transformations are precisely what conditioned the expansion of Japan’s raw silk industry, and in turn, the expansion of the mechanized US sector.

Meanwhile, in the context of rapidly worsening economic conditions and widespread political discontent, a number of small political factions of the Liberty and People’s Rights Movement sought to recruit gambler-outlaw clans and groups of indebted peasants to form revolutionary armies to overthrow the Meiji government. At the peak of the economic crisis in 1884, on at least two occasions, peasant sericulturists in cash-crop sericulture districts where gambling flourished rose up with the aid of local *bakuto* (gambler-outlaws) and radical members of the Liberty Party (Jiyūtō) (Boles 1998, forthcoming). The Chichibu rebellion was not only the largest and most violent among these incidents, but it was also the very last millenarian peasant uprising. The revolt began on November 1, 1884 in Chichibu district, Saitama prefecture, when between 3000–6000 well organized peasants began smashing the homes of moneylenders, burning government offices that contained loan records, and battling local militia and eventually government troops. The uprising lasted several days and spread across three prefectures.

The Chichibu rebellion is perhaps the most debated event in the social history of early Meiji Japan. The two most common positions stem from differing interpretations of the participants’ status, political affiliations, demands, and actions. While most Chichibu rebels were peasants who targeted local creditors to free from themselves from indebtedness, and who acted in the tradition of millenarian customs of protest, the top leaders claimed or actually had Jiyūtō

membership and apparently planned to march on Tōkyō to overthrow the government.

Thus, on the one hand, the event has thus been characterized as the last and greatest uprising of the Liberty Movement, one with with the characteristics of a “bourgeois and democratic revolution” (Azami 1975; Ebukuro 1950; Inoue 1968; Irokawa 1981, 1984, 1985: 155; Nakazawa 1954, 1991). On the other hand, it is said to be the last and greatest armed millenarian uprising of Japan (Chishima 1983, Inada 1973, 1984, Moriyama 1981, 1984, Scheiner 1974, Yasumaru 1984). The works in English on the incident essentially follow one or the other of these two positions (Bix 1986, Bowen 1980, Hane 1982, Jansen 1995, 2000, Norman 1940; Scheiner 1974, Vlastos 1995).

Both interpretations, however, neglected the role of *bakuto* (gambler-outlaws) in this and other incidents of that year, and of course none place the worsening conditions of the rebel peasants within the framework of the Japan–US silk network.

The involvement of *bakuto* was partly the outcome of the “raise-an-army” tactics of several radical Jiyūtō factions who sought to recruit gamblers and indebted peasants into an army that would overthrow the Meiji government (Boles, forthcoming). However, local peasant sericulturists cum petty gamblers had already initiated a debt deferral petition movement in Chichibu before Jiyūtō radicals—members of the *Yūshinsha* political organization in neighboring Gunma prefecture who were active in the area—recruited them into the party in early 1884. Still, the influence of these Jiyūtō radicals on the *bakuto* sericulturists was consequential, in terms of providing them with encouragement and gump-tion than in infusing them with modern political ideals of democratic government. However, most *bakuto*-peasants’ notions of justice stemmed from their own millenarian traditions, and they interpreted the Jiyūtō from this perspective. Petty gambler Arai Teikichi, for example, testified that when he was visited by Sakamoto Sōsaku (one of the *bakuto* who initiated the debt deferral petition struggle) and his *bakuto* friend, Onda Uichi, they had said:

On 1 November there will be a gathering which is so important that even people suffering greatly with hardship should come. Uichi said I should gather ten of the Jiyūtō members at Kobayashi Shōnokichi’s house and tell them the same thing; that the Jiyūtō will hold a gathering in Ōmiya in Chichibu district ... and if this gathering goes well, the usurers and banks will be crushed and *the world will be made even* (CJSS III: 137. italics added).

The Jiyūtō symbolically authorized violence to “make the world even.” But to “make the world even,” was a millenarian ideal that when put into practice meant smashing creditors’ houses and burning loan records stored in government offices. Certainly this was no concept of Liberalism. As Moriyama explains,

The concept *yonarashi*—in the Chichibu peasants own words, ‘make household wealth even’ or ‘make the world even’—were not ideas invented by politicians or philosophers. This is true of the term *yonaoshi* [world renewal] as well. Both terms developed over a long period of social history and uprisings since the pre-modern era. By the Bakumatsu period they were finally explicitly expressed in this language. Thus, they are nothing other than popular social ideas” (Moriyama, 1984: 72).

Bakuto Teikichi could not have been more clear: in answer to the interrogator’s question, “what is the doctrine of the Jiyūtō?” he responded, “It’s doctrine is to destroy the usurers and the banks that greedily charge high interest rates and control all the money, and to help the poor people” (CJSS III: 137).

A final noteworthy twist in this mix of millenarianism and Jiyūtō slogans are the references to the conservative Jiyūtō President, Itagaki Taisuke, as a millenarian “Great Rectifier” or a Great *Oyabun* (Outlaw Patron). Itagaki was no supporter of social movements. Within days of the uprising he denounced it and dissolved the Jiyūtō to disassociate himself from Chichibu rebels with Jiyūtō membership.

How could the rebel’s image of Itagaki differ so radically from the reality? Perhaps this too is linked to Yūshinsha activists (the Jiyūtō faction from Gunma) who, prior to and after the Gunma incidents, spread the word of Itagaki as great defender of the people. For example, before his arrest for his role in the “second Gunma incident,” Yūshinsha activist Murakami Taiji traveled the district telling people that “Itagaki’s army would assemble, rout government officials, reform the tyrannical government into a good one, and make the world free so people can live peacefully” (CJSS VI: 86). Likewise, his mentor, Arai Kisaburo, after his acquittal in the Gunma incident, continued organizing in the area. He told at least two hundred peasants in late October 1884 that “according to the orders of President Itagaki, one-hundred thousand Jiyūtō members from all areas will revolt sometime between November first and third, and in all prefectures and wards, police stations and offices will be wrecked, politics will be made free [“jiyū”], and taxes will be reduced to one-one hundredth of what they are now” (Azami 1990: 68).

The combination of bakuto support for peasants, their personal chivalry, the encouragement of Jiyūtō activists, and the perception of the Jiyūtō president as a deity-like leader, provided leaders and peasant rebels alike with sufficient gumption and moral authority to create an unusually well-organized rebel force structured along the lines of a political party and army combined, and to obtain justice and wealth equalization through a quasi-millenarian world renewal rebellion—Japan’s very last. Had they not made this breakthrough, the debt deferral struggles probably would have proceeded peacefully and unsuccessfully as they

did elsewhere in Japan during the mid-1880s. But from a world-historical view, it is essential to take into account the rise of the Japan–US silk network. For this takes into account the worsening conditions of peasants with regard to growing global competition that drove down raw silk prices and the government’s nationalist export-oriented and military development policies that impinged on peasants by giving new powers to moneylenders cum landlords and to silk merchants (with the aim of increasing silk exports for strong foreign currency to purchase Western military weapons and technology). The Chichibu rebellion was the imbrication of local social relations and customs, the reconstitution of ideas and forms of struggle on new terrain shaped by national mediations and the world-scale processes and forces of the Japan–US silk network in the world-economy.

CONCLUSION: HISTORY AND THEORY

For the first time in world history, specialized silk production activities in America and East Asia became integrated within a globe-spanning division of labor. During the mid-1880s producers in France and the US became the leading woven silk producers among wealthy states through purchases of raw silk from East Asia. During the 1850–1884 period, China became the main foreign supplier of raw silk to France while Japan became the main supplier to the US.

To examine the historical processes of unequal exchange and stratification the unit of observation selected for this study is the Japan–US silk network. An incorporated comparisons method was developed through reconstructing the interrelationships of agencies, labor forms, and interstate structures of the Japan–US silk network to explain the historically specific interrelation of local and interstate processes and inequalities. The categories of “unequal exchange,” “commodity chains,” and “class relations/forms of production,” were not treated as independent “fields of inquiry.” Rather, the meaning of these conceptions have been relationally defined as dimensions of distinct world-historical processes of the network examined at local, regional, and interstate levels of abstraction. In this respect, this body of this paper is not strictly about unequal exchange or commodity chains or class relations per se, but about the historical processes and elements of systemic inequality.

More specifically, I have argued that interstate disparities of the Japan–US silk network arose through the interconnections among distinct capital-labor relationships; that uneven prices and remuneration resulting in interstate inequality occurred as a consequence not only of local capital-labor relations of the production, but from the very integration of these relationships because the integration of these different forms fundamentally shaped markets.

The expansion and higher profits of the US silk industry was based in part

on greater productivity and labor exploitation of the mass-production US silk factories. This productive advantage not only translated into lowering wages per unit, de-skilling, and use of lower cost female and child labor, but also into a price-reducing force on the raw silk market by virtue of the monopolistic market power gained as oligopolistic buyers of raw silk. That market power derived directly from the high productivity and high entry costs attending the expense of mechanized machinery investments. Relatively few entrepreneurs could engage in mass production silk manufacture, but those who did could process the raw silk imports of hundreds of thousands, perhaps millions of raw silk producers. Their oligopolistic power contributed to driving raw silk prices below their value and thus in turn provided value subsidies to US producers. Silk producers in Japan in the first place had expanded production and exports to meet the needs of industrial manufacture relations in the US. Asian producers of raw silk were far more in number and far less productive per person compared to the US suppliers, and they were “locked into” the markets supplying these producers. Consequently, they faced intense market competition among themselves that was amplified by the oligopolistic market power of the US silk manufacturing enterprises and wholesale buyers.

Thus, the conjoining of historically specific industrial wage and non-wage forms of production, which composed the Japan–US silk network, created and exacerbated infundibular market structures—with conditions of relative intense competition at one end and oligopoly at the other. The different market pressures that effectively lowered prices of raw silk below their value arose primarily from the very juxtaposition of different forms/class relations of production, that is, from the division of labor itself. The low price of raw silk was not simply a manifestation of intense class exploitation of peasants and female mill workers by landlords and mills owners. Rather, the integration of specific forms of production and class relations through interstate markets decisively structured the uneven market pressures on the prices of commodities in those markets, and in turn on production relations, thus effecting price-reductions of the exchange-value (of socially necessary labor) of raw silk.

In view of their interdependence, the forms of production and protest in the Japan–US silk network should not be treated as each having a self-contained logic, though they did have distinct logics. Distinctiveness within a totality does not exclude the interrelatedness of elements that are formative of a totality. On the contrary, as elements of a totality they must be both distinct and interrelated. It was through the regular unequal exchange of US cash and Japanese raw silk within this interstate division of labor that local-regional relations and circumstances of raw silk production became mutually conditioned and transformed. The cash income from raw silk exports, declining with the tendential fall in raw

silk prices, sustained sericulture and raw silk relations of production in Japan within increasingly intense parameters of instrumental rationality and profit maximization, just as the raw silk sustained and subsidized silk factory relations in the US. Thus, the social relations and conditions of sericulture and raw silk reeling in Japan, through raw silk exports, entered into the conditions of factory production and class conflicts in Paterson, New Jersey, just as factory relations of mechanized silk production in the US entered into the historical environment of peasant sericulture and rebellion and raw silk reeling, patriarchal relations, and mill strikes by women workers in Japan. The “local” conditions of each conflict were thus molded by world-historical processes encompassing the interdependence of their circumstances in the interstate silk network, and it was a formative part of the capitalist world-economy.

If I have stressed the importance of market mediations shaped by the juxtaposition of labor forms as elemental to unequal exchange, I have also emphasized that unequal exchange was thus also sustained on the basis of contingent social conditions of production, class-patriarchal relations in particular. Intensifying class-patriarchal exploitation in both the US and Japan decisively conditioned value magnitudes and prices of labor within and among the interdependent production activities. Patriarchal relations of production, contradictorily embedded within wider social and state-sanctioned patriarchal relations, restricted wage-work activities and opportunities for women, under-priced the value of their labor, and lowered the price of raw silk, while subjecting women workers to various forms and degrees of sexual abuse and humiliation.

Price-lowering patriarchal relations of production that conditioned unequal exchange were not automatic, but historically constructed and changing. When Japanese entrepreneurs faced ever intense competition to meet ever-increasing US demand, they sought to reduce costs by controlling day-labor workers. Their efforts initially worsened conditions for women workers leading to the Kōfu strikes of 1885–86, which were followed by few thereafter during the Meiji era. Within a few years, filature owners tremendously expanded the labor market and gained greater control over female workers by destroying the day-labor form of production with the establishment of factory dormitories which housed many young and initially semiskilled women, many from indebted peasant households located in distant villages.

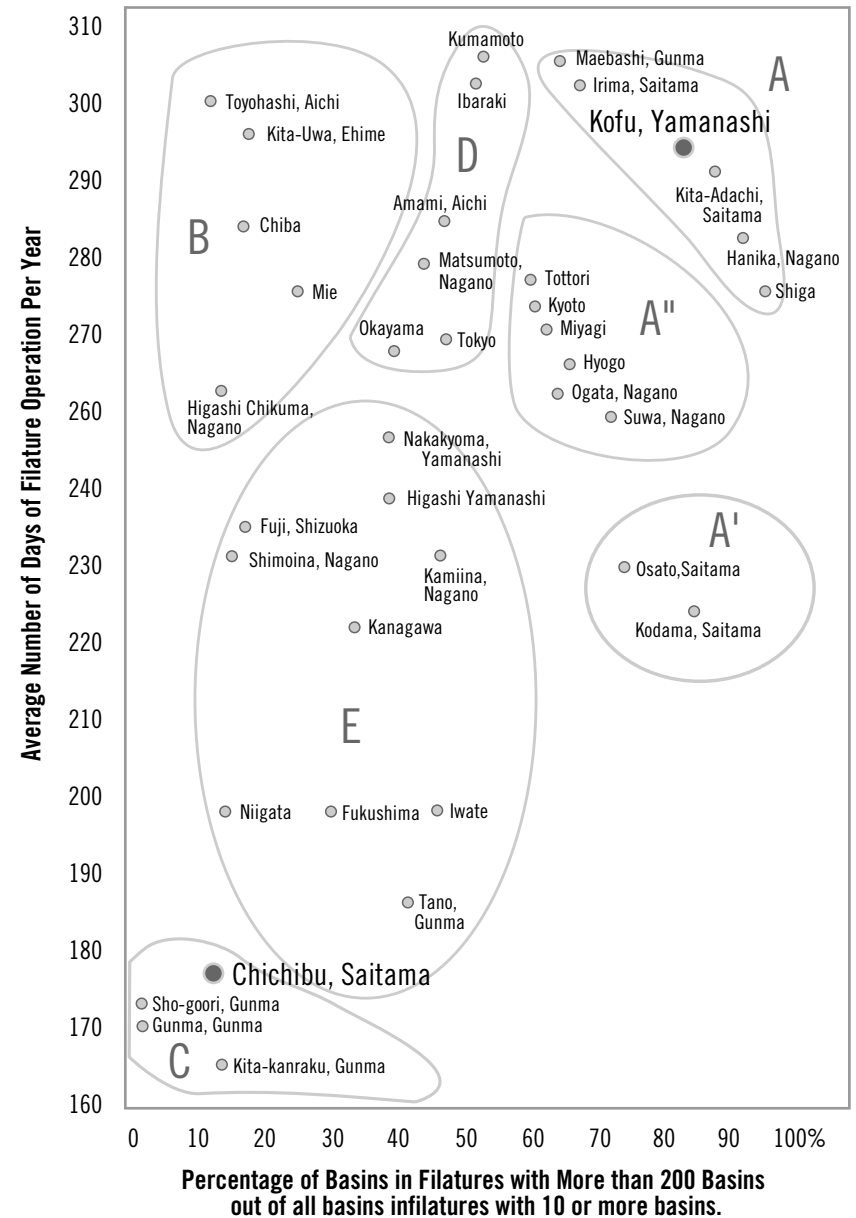
The success of mill owners in overcoming worker resistance contributed to the continued expansion of the US silk manufacturing industry. But US expansion also led to new class-patriarchal contradictions in Paterson, New Jersey, the “Lyons of America.” The strikingly different local outcomes of these interrelated processes resulted from the opposite spatial strategies of labor control taken by US and Japanese entrepreneurs. Paterson entrepreneurs tried to increase the

number of women employees whom they hired at lower wages. But resistance by male workers to the hiring of female workers, combined with spreading unionization, worker militancy, and rising wages in general during the mid-1880s, led Paterson's entrepreneurs to decentralize silk manufacturing operations by relocating to annex facilities in smaller towns where they hired semi-skilled women and child laborers to operate new semi-automated and mass-production machinery. In contrast, the establishment of the factory-dorm system, raw silk production became concentrated in large-scale filatures in the urban areas of silk cities, including Kōfu. Labor resistance was not destroyed in Paterson as it was in Kōfu. In view of the interconnections of these developments, it would have been insufficient to merely observe that the Kōfu solution was a manifestation of greater coercion, as typically found in semiperipheral areas, and the Paterson solution a manifestation of greater freedom.

The transitional nature of the network's formation is exemplified not only in the fact that the Kofu strikes were the very first known factory strikes in Japan, but also by Japan's very last millenarian peasant uprising in 1884 among indebted sericulturists (Boles 1996, 1998). Just as British textile industrialization had required enclosures and slavery, the rise of the Japan-US silk industry required the full subordination and alienation of peasant lands held by sericulturists. The triumph of local landlords/creditors over indebted peasants in Japan during the mid-1880s was a truly major turning point and marker of Japan's incorporation into the capitalist world-economy. At no other period before or since did so much rural land come into the control and private ownership of the rural wealthy. Irrecoverable debt to moneylenders among Japanese peasants, especially in sericulture areas where cash-crop production was advanced and tied to world-markets led to widespread land forfeitures caused in part by collapsing raw silk prices which were the direct result of the Meiji government's deflation policy and currency-trade reforms. The Matsukata reforms, launched in the early 1880s were explicitly designed to strengthen the yen, increase raw silk exports, and advance Japan's position (in the capitalist world-economy).

The Chichibu rebellion of 1884 was exemplary of all these local and world-historical changes. The cultural form of rebellion by these small-plot holding sericulturists who faced unprecedented land forfeitures was, for example, truly transitional. On the one hand, rebels were inspired by millenarian figures, deities, and led by gamblers. On the other gambler-leaders had formed "poor people's parties," joined radical factions of the national Liberty Party, which was itself the head of Japan's first popular movement for representative democracy and civil liberties. Chichibu gamblers joined the party because their millenarian notions of equality and freedom vis-à-vis dominating landlords and local officials meshed well with comparable notions of equality and freedom espoused by the

Figure 1: Hierarchy of Meiji Silk Mills by Size and Days in Operation 1918



Liberty Party vis-à-vis Japan's oligarchic government. However, both movements were crushed by government military forces. Modern landlordism took root and peasant resistance to the untrammelled expansion of rural banking and landownership, and to perhaps the lowest cost sericulture industry on the planet, had been cleared away. Japan's raw silk mill owners obtained cheap cocoons and cheap female labor from destitute peasant farmers while US silk factories obtained cheap raw silk.

In sum, this analysis of the network's unequal division of labor has permitted the interwoven connections among seemingly disparate developments and events and forms of collective protest to be understood on the basis of their mutual formation and transformation, and as formative parts of the capitalist world-economy. The method of incorporated comparison developed here has sought to explore world inequality and unequal exchange by examining the structuring of infundibular markets consequent to the integration of distinct wage and non-wage forms, and by contemplating the world-historical dimensions of local events and the local faces of global processes (Tomich 1990).

APPENDIX I: REELING INDUSTRY STRUCTURE

The sundry grades of raw silk shipped from Japan to the US may be simplified to three basic grades of quality which generally corresponded to three strata of raw silk producers. The lower quality raws tended to be produced by women in small peasant households who, as petty sericulturists, also produced their own cocoons which they reeled into raw silk using older or lower quality hand reeling apparatuses and communal or fee-based re-reeling facilities. The lower quality raws produced in small peasant households were characteristic of areas like Chichibu district where peasants increasingly competed with small and medium mill owners who used nearly the same techniques, but who purchased cocoons of higher quality and who seasonally hired skilled women reelers. Many others simply sold their cocoons to regional merchants who in turn sold them to mill owners. Small to medium mill owners purchased from local and regional merchants most of the cocoons that their mill hands reeled. The owners of the medium to large filatures, which produced most of the higher quality Japanese silk, sourced their cocoons from larger wholesalers who in turned sourced from national markets. To these different grades of raw silk also corresponded geographic concentrations of production. The largest of the medium-sized mills, which hired up to fifty or so young women workers and produced a medium quality silk, were concentrated in areas like Gunma, Fukushima, and northern Japan. The large filatures, most of which were established by wealthy silk merchants typically hired between 50 and 100 women. These highly productive

filatures arose in the "new" silk districts like Kōfu, Suwa, and Amami in central Japan, and produced the country's higher quality raw silk. The first known factory strikes in Japan occurred in Kōfu filature mills, and the last millenarian peasant uprising in Japan occurred in the Chichibu sericulture region.

REFERENCES

- Adas, Michael (1979 [1987]). *Prophets of Rebellion, Millenarian Protest Movements against the European Colonial Order*. London: Cambridge University Press.
- Arrighi, Giovanni (1995). *The Long Twentieth Century: Money, Power, and the Origins of Our Times*. London: Verso.
- Amin, Samir (1977). *Imperialism and Unequal Development*. New York: Monthly Review Press.
- Amin, Samir (1980). "The Class Structure of the Contemporary Imperialist System", *Monthly Review (USA)*, 31 (1980), 8: 9–26.
- Azami, Yoshio (1990). *Chichibu jiken shi* 『秩父事件史』(Chichibu Incident History), Tōkyō: Gensōsha.
- Bix, Herbert (1986). *Peasant Protest in Japan 1590–1884*. New Haven: Yale University Press.
- Boles, Elson E. (1996). "Kindai shakai shisutemu ni okeru ichijiken to shite no Chichibu jiken" 「近代世界システムにおける一事件としての秩父事件」 (The Chichibu Revolt as an Event of the Modern World-System) *Jiyūminken*, No. 9 『自由民権 9』Tōkyō: Machida-shi kyōkuiinkai.
- Boles, Elson E. (1998). *Rebels, Gamblers, and Silk: Agencies and Structures of the Japan–US Silk Network, 1860–1990*. Ph.D. dissertation, SUNY Binghamton.
- Boles, Elson E. (forthcoming). *Rebels and Gamblers in Japan: "Bakuto" in the Political and Social Uprisings of 1884*.
- Bowen, Roger (1980). *Rebellion and Democracy in Meiji Japan*. Berkeley: University of California Press.
- Brockett, L. P. (1876). *The Silk Industry in America*. New York: Silk Association of America.
- Chase-Dunn, Christopher (1989). *Global Formation: Structures of the World Economy*.
- Chase-Dunn, Christopher and Hall, Thomas (1997). *Rise and Demise, Comparing World-Systems*. Boulder: Westview.
- Chichibu Jiken Shiryō (CJSR)* 『秩父事件史料』(1970). (Historical Materials on the Chichibu Incident) 2 vols. Compiled by Saitama Shinbun Sha (Urawa: Saitama Shinbun Sha Shuppan-bu).
- Chichibu jiken shiryō shūsei (CJSS)* 『秩父事件史料集成』(1980). Vols. I–VI. Tōkyō: Nigensha.
- Chishima, Hisashi (1983). *Konmintō hōki, chichibu nōmin sensō to tashiro eisuke ron* 『困民党蜂起 秩父農民戦争と田代栄助論』(Poor People's Party Rebellion, Considerations on the Chichibu Farmer War and Tashiro Eisuke). Tabata Shoten: Tōkyō.

- Curtin, Philip D. (1990). *The Rise and Fall of the Plantation Complex: Essays in Atlantic History*. Cambridge [England]; New York : Cambridge University Press.
- Curtin, Philip D. (1984). *Cross-cultural trade in world history*, (Cambridge [Cambridgeshire]; New York : Cambridge University Press)
- Curtin, Philip D. (2000). *The World and the West: the European challenge and the overseas response in the Age of Empire*, (Cambridge, UK; New York : Cambridge University Press)
- Dore, Elizabeth and John Weeks (1979). "International Exchange and the Causes of Backwardness" *Latin American Perspectives* 6.2.
- Ebato, Akira (1969). *Sanshigyō chūki no keizai chirigakuteki kenkyū 蚕糸業地域の経済地理学的研究* (The Study on sericultural industry from an economic-geographical perspective). Tōkyō: Kokin Shoin.
- Emmanuel, Arghiri (1969 [1972]). *Unequal Exchange: A Study of the Imperialism of Trade*. London: New Left; New York: Monthly Review.
- Endō, Shizuo (1971). *Kabasan jiken*「加波山事件」Tōkyō: Sanichi Shobō.
- Frank, Andre Gunder (1967). *Capitalism and Underdevelopment in Latin America*. New York: Monthly Review Press.
- Frank, Andre Gunder (1999). *Reorient : Global Economy in the Asian Age*. Berkeley: University of Berkeley Press.
- Friedman, H. (1980). "Household production and the national economy: concepts of the analysis of agrarian formations," *Journal of Peasant Studies*, 7, 2, January
- Garber, M. W. (1968). "The Silk Industry of Paterson, New Jersey, 1840–1913: Technology and the Origins, Development, and Changes in an Industry" (Ph.D. dis., Rutgers University)
- Gereffi, Gary and Miguel Korzeniewicz eds. (1993). *Commodity Chains and Global Capitalism*. Westport: Greenwood Press.
- Golin, Steve (1985). "The unity and Strategy of the Paterson Silk Manufacturers during the 1913 Strike" in Scranton, P.B., ed. *Silk city: studies on the Paterson silk Industry, 1860–1940*. Newark: New Jersey Historical Society.
- Goldberg, David J., "The Battle for Labor Supremacy in Paterson 1916–22" in Scranton, P.B., ed. *Silk city: studies on the Paterson silk Industry, 1860–1940*. Newark: New Jersey Historical Society.
- Gutman, H. G. (1976a). "The reality of the Rags-to-Riches 'Myth': The Case of the Paterson, New Jersey, Locomotive, Iron, and Machinery Manufacturers, 1830–1880" in *Work, Culture, and Society in Industrializing America*. New York: Alfred A. Knopf, Inc..
- Gutman, H. G. (1976b). "Class, Status and Community Power in Nineteenth-Century American Industrial Cities: Paterson, New Jersey: A Case Study" in *Work, Culture, and Society in Industrializing America*. New York: Alfred A. Knopf, Inc.
- Gutman, H. G. (1987). "Joseph P. McDonnell and the Workers' Struggle in Paterson, New Jersey" in *Power and Culture*. New York: Pantheon.
- Hane, Mikiso (1982). *Peasants, Rebels, & Outcasts*. New York: Pantheon
- Hane, Mikiso (1986). *Modern Japan: A Historical Survey* Westview Press, Boulder and London.

- Hasegawa, Noboru 長谷川昇 (1995). *Bakuto to jiyūminken—Nagoya jiken shimatsu ki 博徒と自由民権:名古屋事件始末記*. Tōkyō: Heibonsha
- Hemmi, Kenzō (1970). "Primary Product Exports and Economic Development: The Case of Silk" Ohkawa, K. et. al. (eds.) *Agriculture and Economic Growth: Japan's Experience*. Princeton University Press, University of Tokyo Press.
- Heusser, Albert H. (1927). *The History of the Silk Dying Industry in the United States*. Paterson, NJ: Silk Dyers' Association of America.
- Hobsbawm, Eric J. ([1968] 1987). *Industry and Empire* (New York: Penguin).
- Hopkins, Terence K. and Immanuel Wallerstein (1986). "Commodity Chains in the World-Economy Prior to 1800" *Review* 10, I:157–70.
- Hosoi, Wakizō (1954). *Jokō aishi*. Tokyo: Iwanami Shoten.
- Inoue Kōji (1994). *Kanpon Chichibu jiken 完本秩父事件*. Tōkyō: Fujihara Shoten.
- Irokawa Daikichi (1974 [1966]). *Kindai Kokka no Shuppatsu 近代国家と出発* (The Beginnings of the Modern Nation-state), in *Nihon no Rekishi*, Vol. 21 日本の歴史 2. Tōkyō: Chuō Kōronsha.
- Irokawa Daikichi (1984). *Minken hyakunen 民権百年*. Tōkyō: Nihon hōsō shuppan kai.
- Ishii Kanji and Sakiguchi Hisashi (1982). *Sekaisijō to bakumastu kaikō 世界市場と幕末開港* (The world market and the opening of ports at the end of the Tokugawa regime) Tōkyō: Tokyo Daigaku shuppan kai.
- Iwane, Shōsei 岩根承成 (1979). "Shiryō kara mita gunma jiken," 資料から見た群馬事件 *Gunma jiken no jitsuzō o otte 群馬事件の実像を追って*. Takasaki: Shuppan Asa o sha.
- Iwane, Shōsei (1980). "Gunma jiken, 'Yoshin shūketsu kettei genpon,' ni tsuite," 群馬事件「予審終結決定原本」について *Gunma ken shi kenkyū*, no. 9 群馬事件史研究. Tōkyō: Gunma ken shi hen san iinkai.
- Jansen, Marius B. (2000). *The Making of Modern Japan*. Cambridge: Harvard University Press.
- Korzeniewicz, Roberto P. and Martin, William (1993). "The Global Distribution of Commodity Chains," *Commodity Chains and Global Capitalism*. Westport: Greenwood Press.
- Kosík, Karel (1976). *Dialectics of the concrete : a study on problems of man and world*. Boston: D. Reidel Pub. Co.
- Köhler, Gernot (1999). "Surplus Value and Transfer Value," *World-Systems Archive, Working Papers*, <http://wsarch.ucr.edu/archive/papers/kohler/svrv.htm>
- Köhler, Gernot (1998). "Unequal Exchange 1965–1995: World Trend and World Tables," *World-Systems Archive, Working Papers*, <http://wsarch.ucr.edu/archive/papers/kohler/toc.htm>
- Laclau, Ernesto (1971). "Imperialism in Latin America" *New Left Review* 67. (May-June): 19–38.
- Lambertz, Jan (1985). "Sexual Harassment in the Nineteenth Century English Cotton Industry," *History Workshop*, 19.
- Li, M. L. (1981). *China's Silk Trade: Traditional Industry in the Modern World, 1842–1937*. Cambridge, MA: Council on East Asian Studies, Harvard University.

- Makihara, Norio (1984). "Konmintō soshiki katei," 困民党組織過程 in *Buso no Konmintō to Minshū no sekai* 武相の困民党と民衆の世界 (Tōkyō:)
- Makihara, Norio (1994). "Seiji to Tokugi, Konmintō no rekishiteki isō o megutte" 政事と徳義、困民党の歴史的位相をめぐって in Konmintō Kenkyūkai (eds.) *Minshū undō no Kindai* 民衆運動の近代 (Tōkyō: Gendai Kikaku Shitsu)
- Margrave, R. D. (1981). "The Emigration of Silk Workers from England to the United States of America in the 19th Century, with Special Reference to Coventry, Macclesfield, Paterson, N.J., and South Manchester, Connecticut." Unpublished Ph.D. thesis, University of London, 1981.
- Margrave, R. D (1985). "Technology Diffusion and the Transfer of Skills: Nineteenth Century English Silk Migration to Paterson" in Scranton, P.B., ed. *Silk city: studies on the Paterson silk Industry, 1860–1940* (Newark: New Jersey Historical Society)
- Martin, William G. (1994). The World-Systems Perspective in Perspective: Assessing the Attempt to Move Beyond Nineteenth-Century Eurocentric Conceptions, *Review*, Vol. XVII, No. 2, Spring
- Marx, Karl (1977). *Capital*, Vol. 1. New York: Random House/Vintage.
- Marx, Karl (1986). "Introduction" [to *Grundrisse* or *Outlines of the Critique of Political Economy*], *Karl Marx, Frederic Engels: Collected Works*. New York: International Publishers.
- Mason, F. R. (1910). "The American Silk Industry and the Tariff", *American Economic Association Quarterly*, Third Series, XI.
- McLewin, P. J. (1985). "Labor Conflict and Technological Change: The Family Shop in Paterson, New Jersey" in Scranton, P.B., ed. (1985) *Silk City: Studies on the Paterson Silk Industry, 1860–1940*. Newark: New Jersey Historical Society.
- McMichael, Philip (1990). "Incorporating Comparisons Within A World-Historical Perspective: An Alternative Comparative Method" *American Sociological Review*, Vol. 55, 3: 385–397
- McMichael, Philip (1991). "Slavery in Capitalism: the rise and demise of the U.S. antebellum cotton culture," *Theory and Society* 20: 321–349
- McMichael, Philip (2000). "World-Systems Analysis, Globalization, and Incorporated Comparison." *Journal of World-Systems Research*, Special Issue: Festschrift for Immanuel Wallerstein – Part II. Vol. VI, No. 3, Fall/Winter. <http://jwsr.ucr.edu/>.
- Mintz, Sidney W. (1977). "The So-called World System: Local Initiative and Local Response" in *Dialectical Anthropology* 2, pp. 253–70.
- Mintz, Sidney W. (1978). "Was the Plantation Slave a Proletarian?" *Review* Vol. I, No. 2, pp. 71–98.
- Mintz, Sidney W. (1985). *Sweetness and Power: The Place of Sugar in Modern History*. New York: Viking.
- Mintz, Sidney W. (1991). "Comment on Articles by Tomich, McMichael, and Roseberry," *Theory and Society*, Vol.20/3 June.

- Moriyama, Gunjirō (1984). "Chichibu jiken no hyōka o megutte—Irokawa Daikichi shi no hihan ni kotaenagara" 秩父事件の評価をめぐって、色川大吉氏の批判にこたえながら (Historical Evaluation of the Chichibu Incident: Comments on the Criticism of Mr. Irokawa Daikichi) *Rekishigaku kenkyū* 歴史学研究 (Journal of Historical Studies), no. 535, November.
- Moriyama, Gunjirō (1981). *Minshūbōki to matsuri, Chichibu jiken to dentō bunka* 民衆蜂起と祭り 秩父事件と伝統文化 (People's uprisings and festivals, the Chichibu incident and traditional culture), (Tōkyō: Sakura Bukusu)
- Moore, Barrington Jr. (1966). *Social Origins of Dictatorship and Democracy: Lord and Peasant in the Making of the Modern World* (Boston: Beacon Press)
- Nimura, Kazuo (1990). "Japan," in Marcel van der Linden and Jurgen Rojahn eds., *The Formation of Labour Movements, 1870–1914: An International Perspective*. New York: E. J. Brill.
- O'Donnell, P. (1985). "Fantasy and Realism Combined: The Manufacture of Silk at Pelgram and Meyer, 1972–1928" in Scranton, P. B., ed. *Silk City: Studies on the Paterson Silk Industry, 1860–1940*. Newark: New Jersey Historical Society.
- Ollman, Bertell (1976 [1971]). *Alienation: Marx's Conception of Man in Capitalist Society*. New York : Cambridge University Press.
- Ong, A. (1990). *Spirits of Resistance and Capitalist discipline: Factory Women in Malaysia*. Albany: State University of New York Press.
- Qingpu, Zhu (1991). "Imperialism and Incorporation—the Case of Chinese Silk," *Bulletin of Concerned Asian Scholars* Vol. 23, No. 4.
- Özveren, Eyüp (2000). "Shipbuilding, 1590–1790," *Review*, Vol. XXIII, No. 1.
- Pelizzon, Sheila (2000). "Grain Flour, 1590–1790," *Review*, Vol. XXIII, No. 1.
- Raffer, K. (1987). *Unequal Exchange and the Evolution of the World System*. London: MacMillan Press.
- Roseberry, William (1989). *Anthropologies and Histories, essays in culture, history, and political economy*. New Brunswick: Rutgers University Press.
- Ross, Robert (1995). "The Theory of Global Capitalism: State Theory and Variants of Capitalism on a World Scale" Smith and Borocz (eds) in *A New World Order?* Westport: Greenwood Press.
- Sarkar, Prabirjit (2000). "North–South Uneven Development: What the Data Show" *Review*, Vol. XXIII, No. 4.
- Sayer, Derek (1987). *The Violence of Abstraction: The Analytic Foundation of Historical Materialism*. Oxford: Basil Blackwell.
- Saxonhouse, Gary, R. (1976), "Country Girls and Communications among Competitors the Japanese Cotton–Spinning Industry," Hugh Patrick (ed.) *Japanese Industrialization and Its Social Consequences*. Berkeley: University of California Pres.
- Scheiner, Irwan (1978). "Benevolent Lords and Honorable Peasants: Rebellion and Peasant Consciousness in Tokugawa Japan," in Najita, T and Scheiner, I. (eds.), *Japanese Thought in the Tokugawa Period, 1600–1868*. Chicago: University of Chicago Press, pp. 39–62.

- Scheiner, Irwan (1974). "The Mindful Peasant: Sketches for a Study of Rebellion" *Journal of Asian Studies* 32:4 August: 579–91.
- Scranton, P. B. (1984). "Varieties of Paternalism: Industrial Structures and the Social Relations of Production in American Textiles," *American Quarterly* 36.
- Scranton, P. B. (1985). "An Exceedingly Irregular Business: Structure and Process in the Paterson Silk Industry, 1885–1910" in Scranton, P. B., ed. (1985) *Silk City: Studies on the Paterson Silk Industry, 1860–1940*. Newark: New Jersey Historical Society.
- Shimizu, Kichiji (1978). "Gunma jiken kenkyū no seiri," 群馬事件研究の整理 in *Gunma jiken no jitsuzō o otte* 群馬事件の実像を追って. Takasaki: Shuppan asa o sha.
- Sievers, Sharon. L. (1983). *Flowers in Salt, The Beginnings of Feminist Consciousness in Modern Japan*. Palo Alto: Stanford University Press.
- Sahlins, Marshall (1985 [1987]). *Islands of History*. Chicago: University of Chicago Press.
- Sahlins, Marshall (1990). *Historical Metaphors and Mythical Realities, Structure in the Early History of the Sandwich Islands Kingdom* (Ann Harbor: The University of Michigan Press).
- Sione, Patrizia (1994). "Patterns of International Migrations, Italian Silk Workers in New Jersey, USA." *Review*, XVII, 4, Fall.
- Stoler, A. (1985) "Carnal Knowledge and Imperial Power: Gender, Race, and Morality in Colonial Asia" Michaela di Leonardo ed., *Gender at the Crossroads of Knowledge: Feminist Anthropology in the Postmodern*. Berkeley: University of California Press.
- Stremelin, Boris (2001). "Bounding Historical Systems: The Frank–Wallerstein Debate and the Role of Knowledge in World History," *Review*, XXIV, 4, 515–31.
- Sugiyama, Hiroshi (1982). "Meiji jūnana-nen konmintō no ichitsuke ni tsuite" (明治十七年困民党の位置づけについて, "On the location of the Chichibu Konmintō in 1884") *Nihon rekishi* 15, kidai 2 (日本歴史 15, 近代 2, Japanese History No. 15, The Modern Era, Vol. 2). Tōkyō: Iwanami shoten.
- Sugiyama, Hiroshi (1986). "Chichibu konmintō tenkei" (秩父困民党点景, "A Point of Interest on the Chichibu Konmintō") *Rinjin* (隣人, *Neighbors*, no. 3, May), (Tōkyō), pp. 84–5.
- Sugiyama, Hiroshi (1994). "Enki' no Tenmatsu" (「延期党」の顛末 ("The Circumstances of the 'Debt Deferral Party'") in *Minshū undō no Kindai* (民衆運動の近代, *People's Movements of the Modern Era*). Tokyo: Gendai Kikaku Shitsu.
- Sugiyama, Shinya. (1988). *Japan's Industrialization in the World Economy*, (London: The Athlone Press).
- Tomich, D. (1990). *Slavery in the Circuit of Sugar*. Baltimore: The John Hopkins University Press.
- Tomich, D. (1991, manuscript). "World Market and American Slavery: Problems of Historical Method" paper presented at the conference on Els espais del mercat, Second International Local History Colloquy, University of Valencia, Spain, April 24–6
- Tomich, D. (1997). "World of Capital /Worlds of Labor: A Global Perspective" in John R. Hall (ed.) *Reworking Class*. Ithaca: Cornell University Press.

- Tsurumi, P. (1990). *Factory Girls: Women in the Thread Mills of Meiji Japan*. Princeton: Princeton University Press.
- Tussing, Arlon, (1970). "The Labor Force in Meiji Economic Growth: A Quantitative Study of Yamanashi Prefecture," *Agriculture and Economic Growth: Japan's Experience*. Princeton University Press, University of Tōkyō Press.
- Vlastos, S. (1986). *Peasant Protests and Uprisings in Tokugawa Japan* (Berkeley: University of California Press).
- Vlastos, S (1995). "Opposition Movements in Early Meiji, 1880–1885," in Marius B. Jansen, ed., *The Emergence of Meiji Japan*. Cambridge: Cambridge University Press.
- Wallerstein, Immanuel (1974). *The Modern World-System I: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century*. San Diego: Academic Press.
- Wallerstein, Immanuel (1979 [1989]). *The Capitalist World-Economy*. Cambridge, Mass.: Cambridge University Press.
- Wallerstein, Immanuel (1984). *The Politics of the World-Economy*. Cambridge, Mass.: Cambridge University Press.
- Wallerstein, Immanuel (1989). *The Modern World-System III: The Second Era of Great Expansion of the Capitalist World-Economy, 1730–1840s*. San Diego: Academic Press.
- Wallerstein, Immanuel (1991). *Unthinking Social Science: The Limits of Nineteenth Century Paradigms*. Cambridge: Polity Press.
- Wallerstein, Immanuel et. al. (1996). *Open the Social Sciences: Report of the Gulbenkian Commission on the Restructuring of the Social Sciences*, by the Gulbenkian Commission on the Restructuring of the Social Sciences. Stanford: Stanford University Press.
- Wallerstein, Immanuel (1998). *Utopistics, or Historical Choices of the Twenty-first Century*. New York: The New Press.
- Wallerstein, Immanuel (1999). *The End of the World As We Know It: Social Science for the Twenty-first Century*. Minneapolis: University of Minnesota Press.
- Wallerstein, Immanuel (2000). "Commodity Chains in the World-Economy, 1590–1790" *Review*, Vol. XXIII, No. 1.
- Wolf, Eric (1982). *Europe and the People Without History*. Berkeley: University of California Press.
- Yasumaru, Yoshio (1974). *Nihon kindaika to minshū shisō*, (Tokyo: Aoki Shoten)
- Yasumaru, Yoshio (1984). "Konmintō no ishiki katei," (困民党の意識過程 The Developing thought of the Pooreq €O People's Party), *Shisō*, 思想 (*Thought*), no. 726, December.
- Yoneda, Sayoko (1959). "Meiji 19 no Kōfu seishi jokō sōgi ni tsuite: Nihon ni okeru saisho no sutoraiku," 明治19の甲府製糸女工争議について, 日本における最初のストライキ (The Kōfu silk-factory girls' dispute of 1886: Japan's first industrial strike) *Rekishi Hyoron* 歴史評論105 (May).

INTRODUCTION

This paper argues that a “new” international inequality has been superimposed over the “old” international inequality, and that this superimposition can help to explain the increasing degree of inequality in the world economy today. This argument is illustrated using the empirical example of the world coffee market. First the paper identifies the basic features of the old international inequality. Next it describes the basic elements of the new international inequality. Then it illustrates how the combination of new and old forms of inequality further disadvantages coffee producers located in peripheral and semiperipheral areas of the world economy. This is shown through comparison of the events following two severe frosts in Brazil, which significantly disrupted the market, causing all participants to adjust to the new circumstances. The differences between these two series of events show how transnational corporations (TNCs) based in the core have gained further advantages over their suppliers in non-core areas.

THEORETICAL FRAMEWORK

I use the framework laid out by Giovanni Arrighi in *The Long Twentieth Century* (1994) to distinguish between old and new forms of international



ABSTRACT

This paper argues that a “new” international inequality has been superimposed over the “old” international inequality, and that this superimposition can help to explain the increasing degree of inequality in the world economy today. The old international inequality was based on the colonial division of labor, in which the periphery provided raw materials to core-based industries. The new inequality is based on control over flows of information and financial capital by core-based transnational corporations (TNCs). This argument is illustrated using the empirical example of the world coffee market, comparing the responses of market participants to two

severe frosts in Brazil, which significantly disrupted the market. Following the first frost, in 1975 under the “old” international inequality, TNCs responded gradually amidst uncertainty over the frost’s impacts, allowing coffee-producing countries to reap windfall profits during an extended period of high prices. TNCs responded immediately to the second frost in 1994, due to their access to information about the severity of the frost and their control over financial instruments used to set the world market price of coffee. This quick response enabled them to capture most of the excess profits resulting from a much shorter period of high prices.

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inequality, and to identify the specific characteristics of the new form. Arrighi argued that the development of the capitalist world economy over the past 500 years can best be understood as consisting of four “systemic cycles of accumulation” with similar structures: the Genoese, Dutch, British and US. These cycles are designated by the hegemonic power that served as the center of capital accumulation during each cycle. Each cycle begins with a period of crisis of the previous regime, during which there is instability and increasing competition for capital. Then, a new regime is consolidated, initiating a period of material expansion, during which capital is rapidly accumulated by developing the means of production under the direction of the new hegemonic power. This material expansion leads to a crisis of overaccumulation, initiating a new period of financial expansion, increasing instability, and renewed competition for capital, which establishes the conditions for the rise of a new hegemon.

I argue that the old form of international inequality was established during the British cycle of accumulation, and was consolidated during the phase of material expansion of the US cycle. The establishment of a new form of international inequality dates from what Arrighi calls the “signal crisis” of the US regime, around 1970, and it is defined by the characteristics of the current phase of financial expansion.

The main achievement of the British cycle of accumulation was to draw the entire world into a single world market, or more precisely into a single social division of labor based on industrial production (Arrighi 1994:250–53). The “discovery” of the rest of the world and the initiation of world trade in products such as spices, sugar, coffee, tea, and cocoa took place during the Genoese and Dutch cycles. But a single, integrated system of international inequality was the creation of the British “cosmopolitan-imperial” regime which extended the division of labor to the areas that produced these products. As Arrighi states, “[u]nder the Genoese regime, the world was ‘discovered,’ under the British it was ‘conquered.’” (p. 219) The essence of the old international inequality, then, is the roles assigned to the different areas in the world division of labor. The colonized areas became suppliers of mass quantities of raw materials to feed the industrial machine, and the new working class that operated it, in Britain and the other core countries of that period, and also served as markets for its products. The stimulants, such as coffee and tea, played an important role in the process, because they served to keep the working class sober and alert as they labored in the “satanic mills.”

In Arrighi’s framework, extensive cycles alternate with intensive cycles, so while the old international inequality was established during the British cycle of accumulation, it was consolidated under the US cycle. During the crisis period dividing these two cycles, the colonial empires of the British period were broken up, and under the US cycle the world economy was nominally divided into

“national” economies. The newly independent former colonies received their own national states and nominal sovereignty within an interstate system; however, their roles in the international division of labor as suppliers of raw materials and markets for finished products remained essentially the same. The integrated national economy of the US served as a model for these newly independent nations; as Philip McMichael (1995) has argued, this model was advanced as the “development project,” carried out under US leadership during its hegemonic period, from the Second World War to the 1970 crisis. Under this model the national economies were to be managed and “developed” by the states. But under the rubric of this model, US-based TNCs became, in Arrighi’s words, “so many ‘Trojan horses’ in the domestic markets of other states” (p.294), reinforcing the positions of the former colonies in the consolidating world division of labor and international system of inequality. To be sure, there were innovations involved. One of the most important was the spinning off of routine, labor-intensive manufacturing operations to the semiperiphery. But this was carefully managed by the TNCs and the US state so as to avoid creating any serious competition with the operations of the TNCs. It is in this sense that the old international inequality was consolidated under the period of US hegemony.

The signal crisis of the US regime occurred around 1970, marked by the US defeat in Vietnam, the breakdown of the Bretton Woods system of fixed exchange rates, and the declining legitimacy of the US anti-communist crusade. The result was a period of financial expansion. According to Arrighi, periods of financial expansion are driven by overaccumulation crises. There is excess capital in search of profitable investments in the expansion of material production and trade, driving down rates of profit. In response to this development, capital is increasingly invested in various kinds of financial deals and speculation, which yield higher profits than investments in production, as well as preserving the liquidity of capital, so that it can be shifted quickly to more profitable opportunities. One result of this financial expansion is a concentration of capital, but another is increasing instability. Arrighi argues that the US government response to this crisis was to abandon the ideal of state management of the national economy and to put its faith in the “self-regulating market,” in the hopes that this would preserve the competitive advantage of US-based TNCs on the world market, and maintain US hegemony. In McMichael’s terms, the “development project” gave way to the “globalization project.”

My argument is that this shift resulted in the creation of a new form of international inequality that is superimposed on the old. This new international inequality is based in the financial expansion that has occurred since 1970, because control over financial capital is its foundation. But rather than just benefiting US-based TNCs, the new ideology of the self-regulating market has

enabled all core-based TNCs to tighten their control over production located in the peripheral and semiperipheral regions of the world, through their control over financial capital. This has enabled them to squeeze additional profits out of these regions to fuel their capital accumulation. This new form of international inequality is superimposed on the old—the old world division of labor that underlies the old inequality is still largely intact. The new inequality just increases the overall degree of inequality in the world. But it is also fundamentally different from the old inequality. The old inequality was based on control over production processes, while the new inequality is based on control over financial capital and closely related flows of information. This change suggests that Arrighi's call for a new research agenda focused on non-territorial spaces-of-flows has the best chance of allowing us to discern the outlines of the next systemic cycle.

This argument is illustrated through an examination of the world coffee market during the period of financial expansion. Specifically, I compare the events following two severe frosts in Brazil, the largest producing country, which accounted for between a quarter and a third of total world coffee production. These frosts disrupted the market and forced all participants to deal with a new situation. The ways in which TNCs and actors in the producing countries dealt with these shocks to the market illustrate how the new international inequality works. The process of financial expansion was at an early stage when the first frost hit in 1975, and it had minimal effects on the development of coffee prices over the succeeding 2–3 years. By the time of the second frost in 1994, the financial expansion was fully developed, and it greatly accelerated the response of prices to the shortage, to the detriment of the producing countries.

COFFEE: THE OLD INTERNATIONAL INEQUALITY

The origins of the coffee trade go back to the Arab traders who brought it into Europe from what is now Yemen, in the 17th Century. The Dutch began planting it in Java late in the 17th Century, and the French brought it to the Caribbean in the 18th, sowing the seeds of the colonial system of coffee production. Coffee is a tropical crop, so the Europeans, who quickly became addicted to it, had to produce it in their tropical colonies. Coffee was just one of the tropical products through which many areas of the globe were drawn into a world division of labor. Sri Lanka, Java, and later, Brazil, became the main suppliers of coffee. While Britain, during its hegemonic cycle, became the major consumer of tea brought from China, and later produced in India by the East India Company, the US, as a result of its revolution against British rule, symbolized by the Boston Tea Party, became the world's largest coffee consuming country. During the period of British hegemony, the European powers obtained their coffee from their colo-

nies: the Dutch from Indonesia, the French from West Africa, the British from East Africa, and the US from its neo-colonies in Latin America.

During the crisis of British hegemony and into the period of US hegemony, national coffee companies began to establish dominant positions in their national markets. In the US, General Foods, with its Maxwell House brand was the dominant company, but it was being challenged by the Folger Coffee Company, which was acquired in 1963 by Procter and Gamble. In France, Jacob Suchard was the largest roaster. In Holland, it was Douwe Egberts. Two large companies, Tchibo and Eduscho, held dominant positions in the German market. Zoegas and Gavalia were the major Scandinavian roasters. General Foods had begun to go international, with operations in Canada, and a large share of the British market. There was one truly global TNC, the Swiss-based Nestle Corporation, with the leading market share in Britain, a major presence in France, and a dominant position in the US market for instant coffee.

These national roasters developed distinctive national blends, based on the types of coffee the coffee drinkers in that country were used to getting from their former colonies. Thus, in France, coffee blends had a high proportion of robustas, the type grown in West Africa, while US blends were based on Brazilian coffee.² The Germans consumed the highest quality Central and South American arabicas, obtained through contacts with German immigrants who had gone into the coffee business in those countries. The large roasters obtained some of their supplies directly from exporters in the producing countries and the rest from national coffee importing companies. The use of blends enabled the roasters to substitute coffees within the four broad types to maintain the overall taste of the blend while purchasing the cheapest coffee available. For instance, US roasters blended Brazils with some higher quality arabicas. If arabicas from El Salvador were unavailable or too high priced, they could substitute coffee from Guatemala or Costa Rica, and the blend would taste about the same. They could cheapen the blend somewhat by replacing a small proportion of the Colombian milds with other milds, or replacing a small proportion of the Brazils with robustas, but they depended on at least some Brazilian coffee.

² There are four broad types of coffee distinguished on the world market. The highest quality are the Colombian milds, produced in Colombia, Kenya and Tanzania. Next are the "other milds," a broad category of arabica coffee produced in Latin American countries as well as Asian countries like India and Papua New Guinea. Below that in quality are the Brazilian arabicas, also produced in Paraguay and Ethiopia. The lowest quality are the robustas, which have a harsher taste and are often used for processing into instant coffee. They are grown in many African and Asian countries.

These national roasters used extensive national advertising campaigns to establish their brand names, and engaged in oligopolistic competition with other major roasters in their national markets through brand differentiation and cents-off promotions. Given the huge promotional efforts expended by roasters, supermarkets, particularly in the US, often used coffee as a “loss leader,” an item sold at or below cost in order to bring people into the store, where they would make other purchases. Once a company had established its brand as the dominant one in a particular market, it was hard for another brand, even one with heavy financial backing for advertising and promotion, to break into that market. This was shown most clearly by the ferocious battles that took place when Folger’s attacked the eastern cities dominated by Maxwell House in the 1970s. Procter and Gamble, the owner of the Folger’s brand, eventually succeeded in breaking the grip of Maxwell House, but it was a long and extremely costly battle (*New York Times*, January 28, 1979, Section 3, p. 1).

Given this situation, it was almost impossible for any coffee processors located in the coffee producing countries to break into the roasting, packing and selling of coffee in the major consuming markets. For one thing, no single producing country could produce a blend comparable to those produced by the large national roasters. Each country grew one, or sometimes two, different types of coffee, and would have had to import coffee to produce comparable blends. For another, roasted coffee went stale quickly, although the vacuum can did keep it fresher somewhat longer. This put potential competitors in the producing countries at a further disadvantage, because they would have had to ship roasted coffee over long distances to the consuming markets. Further, few coffee processors in the producing countries had the market knowledge or the financial clout to compete with the national roasters’ brand advertising and promotional strategies. And as the attempts of Brazilian instant coffee manufacturers to break into the US market showed, even if a manufacturer in a producing country managed to leap all of these hurdles, the major roasters were prepared to use political strategies to thwart the effort (Talbot 1997a).

The colonial role of the peripheral and semiperipheral countries in the overall division of labor surrounding the production and processing of coffee was thus firmly locked in during the period of US hegemony. The coffee producing countries continued to supply green coffee to the importers and roasters in the major consuming countries, and they processed it into final form for consumption. Attempts by states and firms in the producing countries to break into the higher value-added segments of the commodity chain achieved only very limited success. However, collective action by producing countries did bring some success. They began to organize in the 1950s, and were successful in negotiating

an International Coffee Agreement (ICA) with the major consuming countries in 1962. This agreement established an export quota system to limit the flow of coffee to the world market, thereby stabilizing and propping up the price. Because of this, coffee producers, while relegated to the lower segments of the commodity chain, did fare better than the producers of many other primary commodities, in terms of their share of the total income and profit available from all of the operations along the commodity chain (Talbot 1997b).

COFFEE: THE NEW INTERNATIONAL INEQUALITY

This situation began to change in the 1970s, as the period of financial expansion got underway and changed the economic conditions within which the coffee trade operated. The financial expansion was manifested in five inter-related changes in the coffee trade between the mid-1970s and the mid-1990s. First, the concentration of capital took the form of a major consolidation of both coffee trading and coffee manufacturing TNCs. Companies shifted from growth through investment in expanding production to growth by acquisition. Second, producing states’ abilities to regulate the segments of the commodity chain within their own borders was weakened, also hampering their abilities to intervene in the world market. Third, there was an explosion of speculative trading in financial derivatives based on coffee: futures and options contracts. This growing speculative interest loosened the connection between changes in the supply of, and demand for, coffee, and movements of coffee futures prices, and increased instability in the futures market. Fourth, prices of physical coffee became increasingly linked to futures prices, thereby increasing the uncertainty in the prices at which coffee producers would be able to sell their coffee. Fifth, these changes increased the need for detailed, instantaneous information about coffee supplies and futures markets movements, creating a situation where a decisive advantage accrued to the giant, consolidated coffee TNCs. Each of these changes is described in detail below.

Consolidation of Capital

The flurry of mergers and acquisitions that was part of the financial expansion, and that was given further impetus by the Reagan deregulation of the early 1980s, was also felt in the coffee trade. By the early 1990s, four major manufacturers and about eight major trading companies controlled a majority of the coffee flowing into and being consumed in the major consuming markets in North America, Europe, Japan, and Australia.

Four TNCs now account for well over 60% of total coffee sales across all major consuming markets.³ The largest is Nestle, the world’s largest food pro-

cessing company. Nestle pioneered the manufacture of instant coffee for the mass market, and began opening plants around the world in the late 1930s. Nestle has been the world leader in instant coffee for virtually the entire post-war period, with the top-selling brand in almost every major consuming market. In the 1980s, it further consolidated its position by moving aggressively into the R&G (roasted and ground) segment of the market. In the US, Nestle bought Hills Bros. in 1983, and Hills in turn acquired Chase and Sanborn in 1984. In 1985, Nestle added MJB to its US acquisitions, and in 1987 it bought Sark's Gourmet Coffees. In Europe, it acquired Zoegas, a Swedish roaster with large market shares in Northern European markets, in 1986. But in 1999, Nestle changed strategy, selling Hills, MJB, and Chase and Sanborn to Sara Lee and discontinuing the Sark's brand. Instead, it introduced a new line of gourmet and whole bean coffees in the US market, under the old Nescafe brand name. Nestle has also been the leader in the Japanese instant coffee market since the 1960s, and has used this position to move into the rapidly expanding East Asian market.

Close behind Nestle is Philip Morris, which began to diversify out of tobacco and into food processing in the 1980s. It had a huge amount of cash on hand from tobacco profits, but saw that it was no longer profitable to invest that capital in tobacco. Philip Morris is now the largest food processing company in the US, and second in the world to Nestle. In 1985, Philip Morris acquired General Foods; GF's Maxwell House division had been the largest US coffee company for most of the post-war period, and number one in the market for R&G coffee, until Folgers passed it in the late 1980s. GF also already had significant market shares in many of the major European markets, and Philip Morris further con-

³ Information on the consolidation of the coffee manufacturing TNCs in the following paragraphs has been drawn from the following sources: *Tea and Coffee Trade Journal*, March 1982, p. 28; August 1982, p. 26; September 1985, pp. 30–31; July 1988, pp. 35–36; January 1989, pp. 16–22; April 1989, pp. 6–7; July 1989, pp. 6–7; September 1989, p. 72; December 1989, p. 41; December 1991, p. 40; January 1992, p. 103; November 1992, pp. 39–46; December 1992, pp. 16–21; April 1993, p. 76; June 1999, p. 6; *World Coffee & Tea* March 1967, pp. 44–46; April 1989, p. 16; January 1990, pp. 28–30; January 1991, pp. 26–31; Landell Mills, April, 1991; Stopford (1992); *Boletín Cafetera*, May 15, 1993; Mattera (1992), *New York Times*, June 23, 1990, p. 31; March 9, 1999, p. C2; June 9, 1999, p. C4; *Washington Post*, September 28, 1985, p.1; *Los Angeles Times*, October 22, 1999, p. C1; *Business Wire*, June 8, 1999; December 5, 1999; December 14, 2000; *PR Newswire*, November 7, 1989; December 1, 1995.

solidated its position there in 1990, by acquiring Jacob Suchard, one of the largest roasters in France, with a large share of the EEC market; and Gavalia, a major Swedish roaster with large shares of Northern European markets. General Foods, in a joint venture with food processing giant Ajinomoto, is also the largest coffee company in Japan.

The world's third largest coffee manufacturer is Sara Lee, the US clothing and food processing giant which owns Superior Coffee in the US. In 1989, it acquired Douwe Egberts, a Dutch roaster with large market shares throughout Northern Europe, which itself had previously merged with Van Nelle, another major Dutch roaster and food processing conglomerate. Sara Lee also has significant shares of the French and Spanish markets, and is the largest coffee roaster in Brazil. In 1999, Sara Lee moved into third position overall in the US market, by acquiring Chock Full O' Nuts, the fourth largest coffee company in the US, including Tenco, the largest supplier of private label instant coffee in the country. It also purchased Hills Bros., MJB, and Chase and Sanborn from Nestle.

The fourth coffee TNC is Procter and Gamble. In 1963, P&G acquired the Folger Coffee Company, then a major regional roaster based in San Francisco. In the early 1970s, P&G took the Folger's brand name national, by going into the East Coast stronghold of Maxwell House and engaging in a series of brutal discount pricing wars, beginning in Cleveland in 1971 (Hilke and Nelson 1989). By the early 1980s, Folger's passed Maxwell House to become the best-selling brand of R&G in the country. In 1989, P&G bought Maryland Club Foods, producer of the Butter-Nut brand, with large market shares on the East Coast. In 1995 it acquired Millstone Coffee, and in 1999, it bought the bankrupt Brothers Gourmet Coffee, to gain a foothold in the growing specialty coffee market. Procter and Gamble does not have large coffee sales outside the US and Canada, but is still the world's fourth largest coffee company by virtue of being the largest overall in the US, by far the largest consuming market.

All four of these TNCs are multi-product conglomerates, and despite the fact that they are the largest coffee manufacturers in the world, coffee is not their main product. These four companies control over 60% of coffee sales in the major consuming markets, but this statistic actually underestimates the degree of TNC control. In some of the major markets, coffee and food-processing TNCs of only slightly smaller scale also have significant market shares, for instance Tchibo-Eduscho in Germany (these two large roasters merged in 1996), Lavazza in Italy, Paulig in Finland, and Ueshima and Key Coffee in Japan. All of the second-tier European TNCs have expanded their operations since the unification of the European market, and all of them plus the four major TNCs have moved rapidly into, and are competing vigorously for, the newly-opened Eastern European

markets, particularly the more stable ones, such as Poland, Hungary, and the Czech Republic.⁴

Through the 1980s, the increasing concentration of coffee roasters and instant coffee producers in consuming markets began to lead to concentration of coffee importing firms. At the beginning of the 1970s, most commodity trading firms specialized in a single commodity, but during the 1970s, the largest ones began to expand into other commodities related to their main specialization. Tropical commodities were prominent in this movement; thus Gill and Duffus, the largest cocoa trader, moved into coffee and later into sugar, while Sucres et Denrees, the large French sugar trader, moved into cocoa and later coffee. In the late 1970s and early 1980s, the largest manufacturing TNCs, which had been directly importing some of their own coffee, particularly from the large suppliers like Brazil and Colombia, began to turn all of their importing operations over to the trading companies. High interest rates, fluctuating exchange rates, fluctuating prices in the world coffee market, and political instability in some of the producing countries, all combined to increase the risks involved in importing, and the manufacturing TNCs preferred to transfer these risks to the importers. In addition, under pressure of high interest rates in the late 1970s, manufacturers significantly reduced the stocks of green coffee they carried, relying on the importers and on improved transportation and communication systems to supply green coffee for more flexible, just-in-time production.

As the TNCs acquired significant market shares in a number of consuming markets, they began to rationalize their operations, closing roasting or instant coffee plants with small capacity or outdated equipment, and expanding their more modern plants or building new state-of-the-art facilities. These new plants were strategically located near major coffee ports (e.g., New Orleans, Hamburg, and Marseilles) and were often designed to produce for major markets in several different consuming countries. The manufacturers were thus bringing in larger volumes of coffee through a smaller number of ports, and preferred to deal with the largest importers, who could handle the volumes of coffee they required. All of these developments favored the larger trading firms, particularly those that had established multi-commodity operations. As the manufacturing TNCs consolidated, they were also able to use their oligopsony positions to demand better deals from the importers, driving down their profits. Due to all of these added

⁴ *Tea and Coffee Trade Journal*, August 1990, pp. 52–55; January 1991, pp. 52–56; June 1991, pp. 16–18; February 1992, p. 47; July 1994, p. 5; March 1996, p. 6; May 1996, pp. 50–62; F. O. Licht, December 23, 1993; Landell Mills, April 1991; *Boletim Cafetera*, May 15, 1993; *Financial Times*, April 29, 1997, p. 10.

pressures on the importers, when there were sharp downward price movements, as happened in 1979–80, and again in 1986–87, some traders, even some of the largest ones, were driven out of business.⁵

In 1989, the world market price of coffee crashed, following the suspension of export quotas under the ICA, and this drove many more importers, both large and small, out of business. Some of them were already in precarious positions after the 1986–87 coffee price decline and the October 1987 stock market crash (F. O. Licht, November 3, 1987). Some were holding large stockpiles of coffee purchased at high quota prices, which declined precipitously in value after the end of the quotas, and had to be sold at a loss. Others were holding large speculative positions in the futures markets, and also took large losses. But most importers worked on percentage commissions, and when the price fell by 50%, so did their commissions. Thus by the early 1990s, the five largest coffee importers (Neumann, Volcafe, ED&F Man, Cargill, and Goldman, Sachs) controlled over 40% of total world imports (*Boletim Cafetera*, May 15, 1993). Since all five of these companies are privately owned, it is much more difficult to get good information on the companies and their operations than it is for the publicly-traded manufacturing TNCs. Neumann, already a large coffee trader, became the world's largest coffee importer after taking over Europe's largest coffee importer, Bernhard Rothfos, in 1988. The combined company was reorganized in 1989–90 into the Neumann Kaffee Gruppe, and now comprises over 50 companies that deal in coffee exporting from producing countries, importing into consuming countries, futures trading, shipping, insurance, and coffee processing. It reportedly handles about 15% of total world coffee imports, and is unique among the largest traders because its focus is solely on coffee.⁶

⁵ *Tea and Coffee Trade Journal*, January 1986, pp. 96–99; August 1990, pp. 58–61; pp. 96–99; January 1992, pp. 122–23; December 1992, p. 19; Carl Peel, "What Happened to the Greenies?", *Tea and Coffee Trade Journal*, September 1996, pp. 124–29; *World Coffee and Tea*, November 1980, pp. 14–16; January 1981, pp. 38–40, 80–81, 86–87; November 1981, pp. 12–14; November 1982, pp. 12–15; November 1983, pp. 20–22; November 1984, pp. 8–10; January 1985, pp. 30–34; November 1985, pp. 8–11; August 1990, pp. 28–30; Chalmin, 1987, Chapter 6.

⁶ Information on Neumann Kaffee Gruppe from *Tea and Coffee Trade Journal*, January 1988, p. 111; April 1990, p. 60; June 1990, pp. 46–49; *Financial Times*, December 2, 1987, p. 32; *Business Times* (Singapore), June 4, 1993, p. 2; company web site, <<http://www.trxfutures.com>>

Volcafe is the former coffee trading operation of Volkart Brothers, a large European multi-commodity trader and financial company. In 1989, the coffee operation was spun off as a separate company to a management group, and was then acquired by the ERB Gruppe, a Swiss conglomerate that deals in everything from commodity trading to banking to auto importing and distribution.⁷ ED&F Man, already a major sugar and coffee importer, became the world's largest cocoa trader when it acquired Gill and Duffus. In 1994, the company went public, but in 2000, its futures trading business became a separate, publicly traded company, while the commodity trading business returned to being privately held.⁸ Cargill, the giant grain trader, instantly became one of the world's largest coffee importers when it purchased ACLI Coffee in 1984; and J. Aron, the other major US coffee importer, was taken over by Goldman, Sachs in 1981. In addition to the 40% share held by these five majors, the largest *sogo shosha*, C. Itoh, Marubeni, and Mitsubishi, control most coffee imports into Japan, the third largest consuming market, and also import some coffee into the US and European markets. All of these importers are large, multi-commodity TNC traders, and several of them specialize in a range of tropical commodities. As is true for the major coffee manufacturing TNCs, although these firms are the world's largest coffee importers, coffee is generally not their most important commodity.⁹

This concentration of coffee importing and processing TNCs has gone hand-in-hand with an increasing role for financial capital. For the manufacturing TNCs, access to large amounts of capital is crucial, both for pursuit of their merger and acquisition strategies, and for financing the purchases of the huge volumes of coffee with which they deal. Because they are large multi-product conglomerates, they are better able to generate this capital in-house, and have more clout with the largest banks to be able to borrow what they need on the most

⁷ Information on Volcafe from *Tea and Coffee Trade Journal*, April 1989, p. 44; June 1989, p. 40; *Financial Times*, March 16, 1989, p. 45; May 9, 1989, p. 31; *New York Times*, March 25, 1983, p. D2; company web site, <<http://www.volcafe.com>>.

⁸ Chalmin, 1987, Chapter 6; company web site, <<http://www.edfman.com>>.

⁹ The exception to this is Neumann, as stated above. Sources for the information in this paragraph not footnoted elsewhere are: *Tea and Coffee Trade Journal*, December 1981, p. 46; June 1984, p. 41; September 1986, pp. 24–27; July 1990, pp. 18–20; December 1990, p. 15; January 1992, pp. 122–23; Carl Peel, “What Happened to the Greenies?,” *Tea and Coffee Trade Journal*, September 1996, pp. 124–29; *World Coffee & Tea*, November 1984, pp. 8–10; January 1991, pp. 10–12; F. O. Licht December 15, 1987; June 11, 1993; Landell Mills, April 1991; Ward's, 1994.

favorable terms. For the trading TNCs, the line between banks and commodity traders became increasingly blurred as a result of the banking deregulation of the 1980s. On the one hand, the large traders were increasingly participating on the commodity futures markets, both to protect themselves against losses on their purchases and sales of physical commodities, and also as part of an integrated trading strategy designed to maximize their profits. They added financial services to their range of commodity trading activities. On the other hand, while some banks got out of commodity financing altogether, other banks began developing specialized commodity divisions to handle this aspect of their business, as it became more risky and complex. As banking was deregulated, some banks also began to trade in financial instruments, including commodity futures, to protect their loans, and also to increase their profits. And some financial services companies, such as Goldman, Sachs, became importers of physical commodities as well. The end result was a set of giant trading and financial companies that had three important advantages in the world market conditions of the 1980s and 1990s. They had the ability to shift funds from one commodity to another in response to price changes and profit opportunities. Second, they had access to large amounts of capital, both in-house and from major banks. This not only allowed them to purchase the huge lots of coffee demanded by the consolidated giant roasting TNCs, but also to be able to take quick advantage of opportunities to take over other coffee traders who might find themselves in financial difficulties. Finally, they also had the capital and the expertise to play the commodity futures markets, not only to hedge their coffee purchases, but also to increase their profits. For some, the trading of financial instruments became almost as important to their bottom lines as the trading of physical commodities.¹⁰

Weakening of Producing States

Most states in the coffee producing countries exerted some control over coffee growing, processing and exporting that occurred within their own borders. Coffee was an important source of foreign exchange for most of these countries, and as a major export, also a potentially large source of government revenues. In Latin America, most producing countries had state coffee agencies that performed a variety of functions. Typically they had agricultural extension and research services for growers, but they also attempted to protect growers by set-

¹⁰ *Tea and Coffee Trade Journal*, January 1986, pp. 96–99; August 1989, pp. 2–3; *World Coffee and Tea*, November 1983, pp. 20–22; January 1985, pp. 30–34; November 1986, p. 13.

ting minimum prices at which processors and exporters could buy coffee from the growers. Most of these agencies also regulated exports by issuing export licenses to exporters and setting minimum export prices. African countries typically had state marketing boards that held a monopoly over coffee exporting, in addition to providing agricultural extension and regulating the internal market. Brazil's state coffee agency, the *Instituto Brasileiro do Café* (IBC) was a typical Latin American agency, but it also performed several additional important functions. It regulated the coffee roasting industry that produced for Brazil's large internal coffee market. It maintained the massive Brazilian coffee stockpiles, using them to regulate the internal price of roasted coffee and also to promote the Brazilian instant coffee industry that produced for export, by selling coffee from the stockpile cheaply to these industries. The Colombian agency, the *Federacion Nacional de Cafeteros* (FNC), was unique. It was an independent organization, jointly controlled by the state and the large coffee growers, with broad responsibilities for regulating the coffee sector. In addition, it also exported coffee, in competition with the private exporters, and aggressively sought new markets for its coffee. It is probably best known for its invention of Juan Valdez, used to promote the image of Colombian coffee in the consuming countries.

The state agencies used their regulatory power to extract revenues from the coffee sector, so that coffee growers usually only received a percentage of the world market price. In Latin American countries this percentage was usually fairly high, but in the African and some Asian countries, the marketing boards extracted significant revenues from the coffee sector, and this percentage was often less than half. However, there were advantages to this arrangement for the growers. In a world market where prices tended to fluctuate wildly, the state agencies could cushion the growers from these price swings by adjusting the percentage of the world market price that was returned to growers. Thus when world market prices were high, they could return a lower percentage to the growers and keep the additional revenue to allow them to maintain a steady price to growers even when the world market price dropped.

After the crisis of the 1970s, the US government decided to abandon the ideal of national regulation of nationally-based economies that had governed its international economic policies in the post-war period. In its place, the US began a push to "free" markets, in order to open them up to US-based TNCs (Arrighi, 1994). This new "Washington consensus" was forced on many peripheral and semiperipheral countries through structural adjustment programs during the debt crisis of the 1980s (McMichael 1995). The effects of structural adjustment on the state coffee agencies were delayed by the existence of the ICA, because the agencies needed to regulate their coffee sectors in order to comply with the

export quotas. But after the ICA quotas ended in 1989, many coffee producing countries were pressured by the US and the international financial institutions to reduce the roles of their state agencies in the coffee sector. In particular, many of the state marketing boards were forced to end their monopolies on coffee exporting, and open the trade up to private exporters. After the world market price crashed in 1989, following the lifting of export quotas, the US and the international financial institutions gained an unlikely ally: coffee growers. World market coffee prices remained at historically low levels for several years, and the coffee agencies and marketing boards were forced to significantly lower the prices paid to growers. Many growers then seized on the fact that they had only been receiving a percentage (sometimes very low) of the world market price, and began to actively campaign for reducing the power of the coffee agencies and abolishing the marketing boards. In Brazil, President Collor, in a fit of free market zeal, abolished the IBC, but given the central role of the IBC within the complex Brazilian coffee sector, this move wreaked havoc. Within a couple of years, there were calls by all segments of the coffee industry for renewed regulation, and a new National Coffee Department was created. The Colombian FNC, which enjoyed a high degree of legitimacy with coffee growers, kept its role in the sector, but even it was severely weakened by the period of low prices following the 1989 crash, and was forced to sell off some of its assets.

Thus, at the same time that the coffee TNCs were consolidating their control over the coffee markets in the major consuming countries, the abilities of states in the producing countries to manage their own coffee sectors, and to influence world market prices, was declining. The overall balance of power was shifted decisively in favor of the coffee TNCs.

Increased Financial Speculation

The third way in which the period of financial expansion was manifested in the coffee trade was in the expansion of trading in financial derivatives based on coffee. Coffee futures have been traded in New York since the founding of the New York Coffee Exchange in 1882. Sugar futures were added in 1916, and in 1970 it merged with the New York Cocoa Exchange to assume its present identity as the New York Coffee, Sugar, and Cocoa Exchange (CSCE) (*World Coffee and Tea*, March 1982, pp. 22–24). The coffee futures contract traded on the New York exchange is called the "C" contract, based on Central American arabica coffees. A futures contract for robusta coffee futures began to be traded on the London Commodity Exchange in the 1970s; this exchange has been reorganized several times and is now the London International Financial Futures Exchange (LIFFE). But until the 1980s, the major participants in coffee futures trading were import-

ers and roasters, who used it mainly for hedging, or protecting themselves against sudden price changes.¹¹ This is clearly shown by the relationship between the trading volume on the CSCE and the status of the ICA quotas; when quotas were in effect and prices were relatively predictable, trading volume went down. Trading volume began falling in the early 1960s, as the first ICA was being negotiated. By 1966, after the ICA had been in effect long enough to stabilize prices, the exchange was forced to close trading on the “C” contract because the trading volume was so low. Just as some members of the trade were beginning to suggest that the futures market might be unnecessary because of the stabilizing effects of the ICA, a frost hit Brazil in 1969. This destabilized prices, despite the fact that quotas were still in effect, and trading picked up again. By 1971, strains within the membership of the Agreement were making its renewal uncertain, and trading volume kept increasing, spurred on again by the suspension of the quotas in 1972. By 1973, trading volume had surpassed its late-1950s peak, and the 1975 Brazilian frost drove it to record highs. Trading volume fell off somewhat as prices declined in the late 1970s, and as quotas were reinstated in 1980, it fell off again.¹²

Trading was stimulated again in 1985, when a drought in Brazil began to drive up prices and introduce instability into the market once again. But by this time, a number of other changes had occurred, which increased the centrality of the futures markets. The first change was part of the general proliferation

¹¹ A coffee futures contract is an agreement to deliver a lot of coffee (37,500 pounds on the New York Exchange, five metric tons in London) at a specified future date at a set price. A coffee importer who had just purchased 37,500 pounds of coffee from a producing country, at a fixed price, for delivery in, say, three months, would hedge, or protect himself against the price of coffee going down during that three month period (and thus having to resell the coffee at a loss), by selling one futures contract. This contract would obligate someone else to take delivery of the coffee in three months, at a price high enough to cover the fixed price plus his costs for the transaction. If the price of coffee went down, he could still resell the coffee without losing any money. If the price of coffee went up, he could make a profit on selling the coffee, but would have to use some of that profit to buy back the futures contract he had sold, at a higher price. The importer thus trades off the possibility of making a profit on a price increase for insurance against a loss caused by a price fall. The transaction works exactly the same way, but in reverse, for someone who contracts to sell coffee and wants to protect himself against a price rise. Note: the male pronoun is used here because the vast majority of coffee traders are still male.

¹² Kay Roggenkamp, “Coffee Futures Volume May be Damaged by Coffee Agreement,” *World Coffee and Tea*, September 1981, pp. 30–34; *World Coffee and Tea*, November 1983, pp. 18–20.

of financial instruments and derivatives in the mid-1980s: the introduction of trading in options on coffee futures contracts by the CSCE in 1986. Since these options contracts were considerably cheaper than the futures contracts themselves, they allowed smaller traders and roasters (and speculators) to participate in the market.¹³ But they also gave the TNCs (roasters, importers, and financiers) another instrument to juggle into their integrated trading strategies. The second change in the market in the mid-1980s was the rise of the commodity funds, huge conglomerations of financial capital seeking the highest and most rapid profits available, by trading in financial, oil, metals, and agricultural futures markets. The funds were another way in which smaller speculators, who found trading in coffee futures and options alone too risky, but who could not afford to invest in a diversified portfolio of commodity futures, were drawn into the financial markets. Due to these changes, futures trading remained heavy through the late 1980s, despite the reinstatement of quotas in 1987–89. And since the end of quotas in 1989, the volume of futures and options trading has taken off, posting new record highs each year.¹⁴

These developments decisively shifted the balance of trading on the coffee futures exchanges, from hedgers who were involved in the coffee trade to speculators who were in it only to make a profit.¹⁵ This is demonstrated in Table 1, which

¹³ An options contract is the right (but not the obligation) to buy or sell one futures contract at a set price. As a hedging instrument, it works in basically the same way as a futures contract. Thus an importer who has purchased physical coffee and wants to protect himself against a price decline, would purchase a “put” option, the right to sell a futures contract at a given price at some future date. If the price of coffee falls below that price, the importer could exercise the option and sell the futures contract at an above-market price to recoup his losses on the physical coffee. If the price rises, the importer would not exercise the option and it would expire; he would lose the cost of the option, or the premium, which is analogous to a premium paid to buy insurance. See ITC (1992) for more details. However, one futures contract is a contract for delivery of 37,500 pounds of coffee; at \$1.20 to \$1.45 per pound in the late 1980s, this was a very expensive contract (although the contracts are actually purchased on margins, for a small percentage of this total). In contrast, a coffee option was selling for around 10 cents per pound at the same time.

¹⁴ *Tea and Coffee Trade Journal*, August 1981, pp. 12, 33; September 1986, pp. 17–19; January 1992, pp. 23–24; Carl Peel, “What Happened to the Greenies?” *Tea and Coffee Trade Journal*, September 1996, pp. 124–29). *World Coffee and Tea*, September 1984, p. 10; November 1986, pp. 20–22.

¹⁵ John Heuman, “Futures Markets: Commodity Funds, Speculators, and Influences,” *Tea and Coffee Trade Journal*, November 1999, pp. 46–49.

Table 1 – Total Volume of Coffee Futures Trading, New York and London, and Total World Imports of Green Coffee, 1980–1995, In Millions of Tons

	Exchange		Total Futures Contracts	Gross World Imports
	New York	London		
1980	15.2	5.5	20.7	4.1
1985	11.1	5.1	16.2	4.5
1990	30.2	5.8	36.0	5.3
1991	30.2	6.5	36.7	5.1
1992	36.6	4.8	41.4	5.5
1993	44.1	4.4	48.5	5.3
1994	45.2	6.2	51.4	5.4

Source: ITC (1996), Table 14, p. 72.

compares the volume of futures contracts traded on the New York and London exchanges to the volume of physical coffee traded on the world market. If futures contracts were being traded simply to hedge purchases of physical coffee, then total futures volume would be expected to be about two times the volume of physical coffee traded, assuming that the buyer and the seller in each purchase fully hedged their positions. Table 1 shows that the total volume of futures traded exploded from five times the volume of physical coffee in 1980, to nearly 10 times the volume in 1994. If options contracts, which were not traded in 1980, are added in, the total volume of futures and options traded in 1994 was the equivalent of 73.0 million tons of coffee, or almost 15 times the volume of physical coffee (ITC, 1992; 1996). Thus, by the mid-1990s, the vast majority of trades made on the coffee futures markets were made for purely speculative purposes, and were not connected to sales of physical coffee.¹⁶

The shift from hedging to speculation was also accompanied by a shift in the type of speculation, from that based on fundamental analysis to that based on technical analysis. Speculators who play the coffee futures market based on fundamental analysis rely on projections of future supply and demand, to forecast whether coffee prices are likely to rise or fall in the coming months, and buy or sell futures accordingly, hoping to profit when the futures prices rise or fall. Technical analysis, in contrast, attempts to predict market movements in the future solely on the basis of past market movements, independent of supply and demand

¹⁶ Ibid.

conditions. Technical analysts look at the combination of moving averages of prices, trends in total volume, and trends in open interest (the total number of outstanding futures contracts at a given time), to predict whether the market is likely to move up or down. Since they rely on charts of these indicators to make their forecasts, they are often referred to as “chart” traders. The development and refinement of chart trading during the 1980s meant that many small speculators could engage in commodity speculation without knowing a great deal about the commodities they were speculating in. And while the commodity funds use both kinds of analysis, they tend to rely more heavily on charting. Since the funds are also invested in many different financial instruments, they may sometimes move capital into or out of the coffee futures markets because of their judgements of the profitability of coffee futures relative to other instruments. All of these developments meant that large amounts of money were being shifted in and out of the coffee futures markets, for reasons that were often only marginally related to the actual global situation of supplies of, and demand for, coffee.¹⁷

Finally, the increased volume of trading on the futures exchanges, and the changing nature of the trading, also increased the volatility of futures prices. Speculators followed developments in the coffee market hour-by-hour, if not minute-by-minute. A forecast of cold weather in the coffee growing regions of Brazil, possibly portending a damaging frost, might set off a wave of buying by fundamental analysts, raising the price. The surge in volume and price could trigger a wave of buy orders from the technical analysts, who often had their computers set up to issue an automatic buy or sell order if market trends met certain conditions. Then, a couple of large speculators who decided to sell their contracts to take a quick profit might trigger a wave of sell orders, driving the price back down. A market movement like this could easily take place in the course of one trading day, a 4 hour and 45 minute period on the New York exchange, without any change at all occurring in the overall world supply and demand for coffee, simply in response to speculation that there *might be* a frost in Brazil.

Linking of Physical Coffee Prices to the Futures Market

Another major development linked to the expansion of trading in financial derivatives was the computerization of trading, and this ultimately revolutionized the business. First, reporting of futures trading was completely computer-

¹⁷ Ibid.; ITC, 1992, Chapter 14. The older “coffee men,” who have been involved in the trade for decades, often look down on the younger speculators, who, they say, don’t even know what a coffee tree looks like, and couldn’t find Colombia on a map.

ized, so that the details of each transaction made on the trading floor could be flashed to computer screens around the world almost instantaneously. All of the major roasters and importers were linked into this system and kept continuous watch on the movements of the market. Second, deals in physical coffee were increasingly transacted by computer. In the early 1970s, offers to sell coffee were made by exporters through cables sent to the offices of importing companies, with replies expected by the end of the day or by the next morning. By the mid-1980s, these offers were mostly made by computer messages, with replies expected within the hour.¹⁸

Third, since the current futures prices were immediately available to the traders on their computer screens, and they received offers to buy coffee in the same way, they began to use futures prices to set the prices for their sales and purchases of physical green coffee. Since the "C" contract specified a generally accepted quality standard, prices would be set at a differential to the "C" contract, depending on whether the coffee was of higher or lower quality than the standard Central American coffees on which the "C" contract was based. This linkage made it easier for traders to agree on green coffee contract terms and then immediately hedge the transaction, by buying or selling the appropriate futures contracts. But it also increased the uncertainty involved in the transaction. Exporters could agree to sell a certain amount of coffee at a fixed differential, and then watch the futures price, waiting for what they thought was a peak in the futures price to contact the importer and fix the actual price for the coffee. Of course, neither party to the deal knew whether the futures price would go up or down after the price of the physical coffee was fixed. But the importer did not really care, as long as he had hedged his purchase. Usually, he had already contracted to sell this coffee to a roaster, with price also to be fixed against the exchange, and made his profit by charging the roaster a higher (or lower) differential that he was paying the exporter.¹⁹ In the mid-1970s, almost all coffee was sold at prices fixed when the sale was made; by the mid-1990s, as much as 90% of coffee was sold at a fixed differential to the futures exchanges, with the actual price to be fixed later, by either the buyer or the seller.²⁰

This development made the futures market the key price determination mechanism for the entire industry. In the mid-1970s, when hedgers dominated

¹⁸ *Tea and Coffee Trade Journal*, June 1985, pp. 19–24; *World Coffee and Tea*, November 1980, pp. 12–13; June 1984, pp. 8–9; personal interviews.

¹⁹ For example, the importer would buy coffee from the exporter at a differential of five cents under the "C" contract, and sell it to the roaster at three cents under.

²⁰ ITC (1992); *World Coffee and Tea*, January 1987, p. 62; personal interviews.

speculators on the futures exchanges, the price of physical coffee drove the price of futures contracts. By the mid-1990s, when speculators dominated on the exchanges, the price of paper contracts drove the price of physical coffee. Of course, the price of futures contracts was constrained by the fact that they were contracts for the actual delivery of physical coffee at some time in the future. Therefore, a speculator holding a futures contract had to either liquidate it before the start of the delivery month, or be faced with the prospect of having to take delivery of 37,500 pounds of coffee. This insured that the price of a futures contract always converged on the price of physical coffee as the delivery month approached, and kept a linkage between futures and physicals prices. But the developments over this period significantly weakened the linkage of futures prices to the underlying supply and demand conditions for coffee. The combination of pegging the price of coffee to the futures markets and the increased weight of the commodity funds in these markets has probably increased the overall instability of world market prices for coffee.²¹

Increased Need for Information

By the mid-1990s, anyone who was trading in physical coffee needed to have access to up-to-the-minute information from all over the world. On any day that the futures exchanges were open, they needed to keep an eye on market movements, so that they would not be surprised by sudden price movements that could affect their business. They needed information about weather conditions in several major producing countries, where severe weather that damaged the crop could shift overall world supply conditions. They needed crop forecasts from these countries, because even in the absence of severe weather, an unusually large or small crop could change conditions (coffee trees tend to produce in two-year cycles, where a heavy crop one year is followed by a lighter one the next). They needed information about political conditions and government policies in producing and consuming countries that could change tariffs or interrupt the flow of coffee. They needed information about economic conditions in consuming countries and exchange rate fluctuations that could change the demand for coffee or its import price. Many of these information needs were also present in the mid-1970s. But under the market conditions of the mid-1990s, they were much more pressing. The market was more unstable; it was moving much faster

²¹ *World Coffee and Tea*, January 1987, pp. 65–6; Marazzi, 1984; Kuchiki, 1990; John Heuman, "Futures Markets: Commodity Funds, Speculators, and Influences," *Tea and Coffee Trade Journal*, November 1996, pp. 46–49.

in response to news as well as to rumor. It had a tendency to overreact in one direction, and then overcompensate in the other. Because coffee trading firms were operating under integrated strategies involving buying physical coffee, hedging, and speculating, anyone missing out on a major market move stood to potentially lose a lot of money.

Under these conditions, information itself has become a commodity in the coffee trade, as it has in most other sectors of the economy. News services and wire services provide a wide variety of political and economic news from around the world, as well as weather reports. One daily publication, *Complete Coffee Coverage* provides news specifically related to the coffee trade. Other newsletters giving more in-depth analysis are produced by the largest trading houses, such as ED&F Man in the UK, or by firms specializing in commodity analysis, such as F.O. Licht in Germany. All of these services are available on a subscription basis, and most subscriptions are quite expensive. The business of providing statistical data, market analysis, and charting programs for commodity market speculation has itself become a growth industry. There are several different statistical packages for performing chart analysis available on the market, and other services providing the raw data from commodity futures markets to input into these packages. Keeping on top of all of this information requires money and time—money to buy access to it, and time to digest it. In this situation, the largest trading houses that dealt in multiple commodities and combined physical purchases with financial speculation were clearly in the most advantageous position. They had the capital to access the information, the manpower and expertise to analyze it, and they also had the capacity to develop their own in-house fundamental and statistical analyses of the market (ITC 1992).

But the most important advantage held by the largest trading houses was the capacity to develop their own in-house information systems. By the mid-1990s, the major trading houses had established their own exporting subsidiaries in the major exporting countries. Two important developments created the opportunity for this to happen. The first was the wave of structural adjustment and market liberalization programs forced on developing countries during the debt crisis of the 1980s. This reduced or did away with many restrictions on foreign ownership and control of trading firms within the producing countries. It also led to the ending of the coffee export monopolies of many state marketing boards in African countries. This opened up coffee exporting opportunities to privately owned firms for the first time, and in some of these countries, there were few capitalists or private firms with the capital and expertise to move in and take advantage of this opening. The second development was the price crash following the lifting of export quotas in 1989. In addition to driving many green coffee importers in the consuming countries out of business, this crash also put many

large exporting companies in the producing countries into financial difficulties, leaving them ripe for takeover by the major importers. For example, Neumann now has export companies in Brazil, Colombia, Peru, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Burundi, Cameroon, Ivory Coast, Kenya, Rwanda, Tanzania, Uganda, Indonesia, Papua New Guinea, and Vietnam. Volcafe has export companies in Brazil, Colombia, Peru, Costa Rica, Guatemala, Honduras, Nicaragua, Mexico, Kenya, Tanzania, Uganda, Indonesia, and Papua New Guinea. The large trading houses could thus get up-to-the-minute information from their own operatives inside these countries, who were familiar with the situation on the ground there, without having it filtered through some external service.

RESPONSES TO THE BRAZILIAN FROSTS

With all of these developments laid out, we are ready to turn to an examination of the events following the two severe Brazilian frosts of 1975 and 1994. The first one took place near the beginning of the period of financial expansion, at a time when the old international inequality was firmly in place, but the new one was just beginning to become established. Thus the responses to the first frost reflect primarily the effects of the old form of inequality. The second frost, almost 20 years later, came at a time when the new international inequality was firmly established, and thus the responses to the second frost illustrate the ways in which the new international inequality is superimposed on the old.

Two key pieces of information that affect the underlying fundamentals of the coffee market are crop forecasts and information on the amount of coffee being held in warehouses in the producing countries. These are two pieces of information that are much less accessible to traders and roasters located in the consuming countries than many of the other kinds of information discussed above. And this information is much more readily available to officials in the producing countries, giving them a potential advantage over the TNCs. Comparison of the events surrounding the two frosts shows how this advantage was eroded by the changes in the coffee trade from the mid-1970s to the mid-1990s.

The 1975 Frost

On the night of July 17, 1975, a killer frost struck the coffee growing regions of Brazil, hitting hardest in the more southern areas of Parana, Minas Gerais, and Sao Paulo states. Most of the frosts that strike this area are called “white frosts,” which kill the leaves of the coffee trees and the flowers that will become the next year’s coffee crop. But this was a “black frost,” one that turns the sap black and kills the entire tree. Even so, Brazil’s 1975–76 crop was not severely damaged; the main harvest had begun in April and was about $\frac{2}{3}$ completed, and many of

the coffee cherries remaining on the trees were mature enough to survive the frost. But the dead trees would produce no crop in the 1976–77 harvest year, and even if new trees were planted immediately, they would not begin to bear for another four years. Brazil at this time accounted for about a third of total world coffee production; its production in the 1974–75 season had been about 26 million bags of 60 kg. each. The frost had struck at a particularly bad time. There were civil wars raging in Ethiopia, another producer of arabica coffees of a similar quality to Brazil's, and in Angola, the second-largest producer of robusta coffee. Uganda, another large robusta producer, was also in chaos under Idi Amin. Traders and roasters in the US had been betting on a bumper crop from Brazil that would lower prices, and they had held off buying, so had relatively low stocks on hand.²²

The IBC, the state agency that regulated the coffee industry, temporarily suspended exports immediately after the frost. The IBC regulated exports by setting a minimum registration price—all exporters had to register their exports, and the IBC would refuse registration for any coffee to be exported at less than its minimum price. In the wake of the frost, prices would obviously be higher, and the IBC didn't want to sell any coffee at too low a price, and needed to assess the situation before raising the registration price. On July 23, a week after the frost, the IBC announced that more than 50% of Brazil's 1976–77 crop had been wiped out by the frost. It also announced that it had 15 million bags of coffee in stocks, and that growers and exporters held an additional 6 million bags. These stocks could be used to replace some of the output lost to the frost. On August 1, it lifted the temporary ban, and raised the minimum export price from 50 to 80 cents a pound. Other coffee exporting countries had already posted similar large increases.²³

The main independent US source for information on crop damage and stock levels was the US Department of Agriculture's Foreign Agricultural Service (FAS). They produced regular crop forecasts for a variety of tropical crops produced in Third World countries, including coffee. There was an agricultural

²² *Tea and Coffee Trade Journal*, September 1975, pp. 20–24; *World Coffee and Tea*, September 1975, pp. 14–16, 31, 39; October 1975, pp. 18, 50.

²³ *Tea and Coffee Trade Journal*, September 1975, pp. 20–24; *World Coffee and Tea*, September 1975, pp. 14–16, 31, 39; October 1975, pp. 18, 50; *Business Week*, September 8, 1975, p. 21; *New York Times*, July 24, 1975, p. 10; August 4, 1975, p. 29; August 7, 1975, p. 46; August 22, 1975, p. 43.

officer stationed in the US Embassy in each of the major producing countries to keep tabs on the agricultural situation. Immediately after the frost, an official from the FAS flew to Brazil, and with the agricultural officer stationed there, began a field survey to assess the damage. On August 21, the FAS reported that the 1976–77 crop had been more than 50% damaged. Their preliminary forecast for the crop was between 8 and 11 million bags. The IBC's forecast was for a maximum of 8 million bags.²⁴ There were also questions about the amount of stocks held in Brazil. While the export quotas under the first two ICAs were in effect, from 1962–1972, Brazil had built up massive stocks, probably amounting to well over 70 million bags, more than one year's total world consumption of coffee. But after a series of minor frosts in the late 1960s and early 1970s affected production, Brazil had drawn down those stocks dramatically. Coffee can be stored for 6–7 years under optimal conditions, but after that, its quality has deteriorated to the point where it is no longer usable. So even if the total of 21 million bags in stocks that the IBC had announced was accurate, it was unclear how much of it was of exportable quality.²⁵

Meanwhile, the situation set off a buying frenzy that some traders labeled "frost panic," as traders and roasters bought up whatever coffee became available, even though the real supply shortage was not likely to be felt for another year. Everyone expected the price to go higher, and wanted to buy as much as they could before it did. And roasters began to raise their prices. The upper line in Figure 1 shows the average retail price of coffee, which followed the wholesale price closely, because retailers' margins on coffee tended to be very small. The first to announce an increase was General Foods (Maxwell House), the largest roaster. It increased its wholesale price by 20 cents a pound on July 28, and the other major roasters soon followed suit.²⁶ As prices continued to rise through 1976, retailers and consumers began to hoard coffee, following the same logic as the traders and roasters—buy it now, before it gets more expensive. Coffee roastings in the US were up 15.6% in the first half of 1976, compared with the same period a year before. By October 1976, the national average retail price of a pound of coffee had risen to \$2.12, up from \$1.27 in June 1975, before the frost,

²⁴ *Tea and Coffee Trade Journal*, September 1975, pp. 20–24; *World Coffee and Tea*, September 1975, pp. 14–16, 31, 39; October 1975, pp. 18, 50; *New York Times*, August 22, 1975, p. 43; *Business Week*, November 15, 1976, p. 154.

²⁵ *New York Times*, August 4, 1975, p. 29; November 23, 1975, Section 3, p. 7.

²⁶ *New York Times*, July 29, 1975, p. 35; September 30, 1975, p. 56; January 17, 1976, p. 37; January 24, 1976, p. 43; February 3, 1976, p. 33.

and there appeared to be no end in sight. By the end of 1976, Folger's had broken the previously unimaginable \$3.00 barrier, raising its wholesale price to \$3.08.²⁷ By early 1977, consumers were fed up after almost a year and a half of steadily increasing prices, and there was talk of a coffee boycott. One of the most prominent organizers was Elinor Guggenheimer, New York City Consumer Affairs Commissioner, a self-proclaimed 14-cup a day addict. There were also calls for a Congressional investigation into the soaring prices.²⁸

Table 2 below shows the effect of the frost on Brazilian production and exports. If 1974–5 is taken as a baseline, the frost wiped out about three-fourths of Brazilian production in 1976–77. This production shortfall in Brazil's 1976–77 crop year began to be manifested in world production for the 1975–76 coffee year (which overlapped the Brazilian crop year for the six months of April–September 1976), causing a decrease of about 25%. Brazil maintained its export level by drawing down stocks, but by the 1977–78 coffee year, that was no longer possible, and its exports fell below 10 million bags, leading to a world export shortage of about 10%.²⁹ The response of prices of both physical coffee and coffee futures to this situation followed a similar trajectory; the lower line in Figure 1 shows the trend of the ICO indicator price, an average of the different grades of physical coffee in major importing ports. Before the frost, the ICO indicator price had been hovering in the low 60-cent range, and the “C” futures contract in New York was trading in the 40–50 cent range, for the first half of 1975. The ICO indicator jumped to the mid-80s and the futures price to around 80 cents immediately after the frost, and prices stayed there through 1975. Both rose steadily through 1976, the ICO indicator from 95 cents in January to \$2.05 in December, and the “C” contract from around 90 cents at the start of the year up to about \$2.20 by the end. Both prices continued to rise in early 1977, with the ICO indicator price peaking at \$3.15 in April, and the futures price topping out

²⁷ *New York Times*, August 18, 1976, p. 55; October 13, 1976, p. 63; November 2, 1976, p. 39; December 9, 1976, p. 70; December 21, 1976, p. 57; December 24, 1976, p. D5; January 7, 1977, p. D1.

²⁸ *New York Times*, December 28, 1976, p. 31; December 29, 1976, p. 55; January 4, 1977, p. 12; January 5, 1977, p. D1.

²⁹ Brazil is also a major coffee consuming country, with annual consumption estimated at around 7 million bags at this time. For the first time in history following the frost, Brazil actually imported lower quality robustas from Angola and other African countries, for internal consumption and for use in its soluble coffee industry. This allowed it to export a higher percentage of the coffee it produced and benefit from the higher prices.

Table 2 – Brazilian and Total World Production and Exports of Green Coffee Around the 1975 and 1994 Frosts, in Thousand Bags (60 kg.)

Year	Production		Exports	
	Brazil	World	Brazil	World
1973–74	16,240	75,455	15,273	57,425
1974–75	26,290	74,770	14,808	56,643
1975–76	22,444	56,226	13,014	56,868
1976–77	6,663	68,997	14,741	52,382
1977–78	16,048	74,371	9,268	50,882
1978–79	20,853	81,140	13,217	63,372
1979–80	21,296	76,601	14,192	60,335
1993–94	28,500	93,223	17,022	72,044
1994–95	28,000	98,126	16,544	65,371
1995–96	16,800	89,743	12,728	75,033
1996–97	28,000	102,665	18,619	83,085

Sources: For 1973–80, International Coffee Organization, *Quarterly Statistical Bulletin on Coffee*, No. 19, July–September 1981. Brazilian production is for crop years, April 1–March 30; world production and both export figures are for coffee years, October 1–September 30. For 1993–97, USDA, Foreign Agricultural Service, *Tropical Products: World Markets and Trade*, various issues, 1994–99. The figures for both production and exports refer to coffee years, October 1–September 30.

at \$3.40 on April 14. From that point, it was all downhill. Folger's was the first to respond, dropping its wholesale price on May 12 from \$4.43 to \$4.18 per pound. General Foods followed with a 25 cent cut the next day. Physical and futures prices continued to fall until hitting a low of about \$1.25 in February 1979.³⁰

The producing countries tried to stop the decline of prices during 1977 and 1978, and pulled off a temporarily successful manipulation of the futures market, by executing a series of “short squeezes.”³¹ The first occurred in July 1977 and worked as follows. The main players were the IBC and the Compania

³⁰ CRB, *Commodity Yearbook 1983*, p. 97; International Coffee Organization; *New York Times*, May 13, 1977, p. D7; May 14, 1977, p. 27.

Salvadorena de Café. They bought July futures contracts during June, 1977 (in market parlance, they “went long”). This entitled them, if they so chose, to take delivery of specific grades of Central American or Colombian coffee in New York at the end of July, from the “shorts,” traders who had sold July futures contracts. But they knew that there was very little coffee available in New York of the quality certified by the CSCE as deliverable against the New York “C” contract, and they prevented any more from arriving, by buying it and shipping it to Europe. The “shorts” had sold futures contracts for hedging or speculative purposes, and had no intention of actually delivering coffee. They had intended to liquidate their positions, by buying futures contracts back from the “longs.” But the “longs” were not selling. The only other option the “shorts” had was to find suitable coffee somewhere and somehow get it to New York, to fulfill their obligations under the futures contracts. But the “longs” already held this coffee. In this situation, the “longs” could practically name their price for allowing the “shorts” to liquidate their positions, and make a handsome profit on the deal. Similar operations were carried out on the London exchange, and the operation was repeated for the December 1977 futures contract. At that point, the Commodity Futures Trading Commission (CFTC) stepped in and ordered the “longs” to liquidate their positions in an orderly fashion (*New York Times*, December 30, 1977, p. 1).

In 1978, eight Latin American producers formed the Bogota Group (Brazil, Colombia, El Salvador, Costa Rica, Guatemala, Honduras, Mexico, and Venezuela), and established a fund of \$140 million to carry out similar operations during 1978. In 1979, they made a killing on the July futures contract because of an early frost in Brazil. The Group coordinated its buying of the futures contract with the IBC’s announcement of its estimate of the damage caused by the frost, which was probably artificially inflated. They were holding futures contracts bought at low prices before the announcement, and when the market reacted to the news, futures prices jumped. They reportedly made over \$300 million on this operation. In May 1980, the group incorporated as Pancafe, but at that point, there was too much surplus coffee floating around to make such a short squeeze profitable. Brazilian production had recovered, and new trees planted in other countries as prices began to increase in 1975–76 were beginning to produce. Pancafe lost money and was disbanded later in the year, as part of the agreement to reinstate export quotas under the ICA.

³¹ Information on this manipulation comes from Edmunds (1982) and Greenstone (1981).

The 1994 Frost

On the night of June 25, 1994, a severe frost struck the southern coffee regions of Brazil. It was immediately described as the worst since the 1975 frost. Then, about two weeks later, on July 10, another frost hit. It killed additional coffee trees that had only been weakened by the first frost, as well as striking new areas not hit by the first frost. Once again, the main effect was not on the 1994–95 harvest, which was well underway, but on the following year’s crop. Brazil’s production in the year preceding the frost had been about 28 million bags, similar to its level of production before the 1975 frost, but by this time, Brazil accounted for only about a quarter of total world production. The frost had struck at a particularly bad time. When the ICA quotas had been lifted in 1989, world market prices had crashed, hitting historic lows in 1992. Some growers in many countries had switched from coffee to other crops, and those who continued to grow it had cut back on maintenance and fertilizers. The Brazilian crop was already suffering because of a prolonged dry spell preceding the frost, and this probably increased the frost damage. The 1994–95 crop was expected to be smaller than that of 1993–94, and exportable production was expected to be below total world demand for coffee for the third straight year, resulting in a further drawdown of stocks. Prices had already begun to turn upward in 1994 because of the expected shortage and because of a coffee retention plan announced by the newly formed Association of Coffee Producing Countries (ACPC), in an attempt to raise the world market price.³²

Speculation about the amount of damage to Brazil’s crop abounded. Early estimates from sources in Brazil began to circulate almost immediately at the CSCE, and they put the damage from the first frost at 10 million bags. The earliest official estimate was by the private forecasting organization Accu-Weather, which estimated the loss from the first frost at 30–40% of the 1995–96 crop, with the second frost destroying an additional 10–15%. The Brazilian National Coffee Department (NCD), the successor to the IBC, released its estimate of a production decline of 40% on July 27. The FAS representatives were in the field assessing the damage caused by the first frost when the second one hit. The FAS did not release its estimate until August 12, and it was for a decline of 30–40% in the 1995–96 crop. The NCD forecast was for a harvest of about 16 million

³² *Tea and Coffee Trade Journal*, August 1994, p. 5; *World Coffee and Tea*, August 1994, p. 5; September 1994, p. 5; October 1994, p. 5; *New York Times*, June 28, 1994, p. D1; June 29, 1994, p. D1; July 12, 1994, p. D13; *Financial Times*, June 28, 1994, p. 30; July 12, 1994, p. 1; USDA, FAS, *Tropical Products: World Markets and Trade*, June 1994.

bags, while the FAS estimated 17–20 million. The Brazilian government officially disputed the FAS forecast, saying that it was underestimating the frost damage. Then the German commodity analysts F.O. Licht weighed in with their estimate of 18 million bags on August 26.³³

Coffee prices responded to the frosts immediately. On Monday, June 27, the first day of trading after the frost, coffee futures rose 25%. The next day, the coffee roasters reacted. Folger's raised the price of its 13-ounce cans by 40 cents, and Maxwell House's went up by 35 cents. There was a second price increase in early July, even before the second frost hit, and a third one shortly after the second frost. The upper line in Figure 2 shows the trajectory of retail coffee prices in the US. The July increase in the wholesale price of coffee was a record-breaking 42.8%, driving the US Department of Labor's Producer Price Index up by 0.5% for the month, and raising fears of renewed inflation. Once again, these price increases generated consumer protests, and Richard Kessel, Executive Director of the New York State Consumer Protection Board wrote two letters to Attorney General Janet Reno urging an investigation of the manufacturers' price increases. They had come so rapidly that they could not possibly reflect actual cost increases, he argued.³⁴

Coffee futures prices were extremely erratic. After climbing for more than a week after news of the first frost, they began to fall as traders second-guessed the initial reports from Brazil about the extent of the damage. Then they rose on a forecast of more cold weather in Brazil, and fell when the Brazilian government announced an auction of some of its coffee stocks. Then the second frost hit, prompting a new round of increases. After another week of increases, GNI, a London broker, in its "International Futures and Options Briefing" newsletter, said that the reports of frost damage had been exaggerated, and a CFTC report showed that large speculators were buying heavily, betting on further increases.

³³ *World Coffee and Tea*, August 1994, p. 5; October 1994, p. 5; *Financial Times*, July 12, 1994, p. 1; August 13, 1994, p. 2; August 16, 1994, p. 13; August 27, 1994, p. 12; *Journal of Commerce*, July 28, 1994, p. B8.

³⁴ The 13-ounce cans were a legacy of the 1975 frosts; as coffee prices climbed over an extended period following that frost, the TNCs tried to disguise the extent of the price increases by switching from a standard one-pound can to the 13-ounce size. So Folger's 40-cent increase actually amounted to an increase of almost 50 cents per pound. *New York Times*, June 28, 1994, p. D1; *Financial Times*, July 16, 1994, p. 9; *Buffalo News*, June 29, 1994; *Arizona Republic*, June 30, 1994, p. C1; *Journal of Commerce*, July 25, 1994, p. B6; *Business Week*, August 1, 1994, p. 20; *Chicago Sun-Times*, July 14, 1994, p. 52; August 11, 1994, p. 4; *PR Newswire*, July 2, 1994.

These reports sent prices down again for several days. Then, when Brazil's NCD released its official estimate of the damage, prices soared again, because it was worse than anyone had expected. As the date approached for the release of the FAS official estimate a couple of weeks later, prices fell again, as traders expected it to be more optimistic than the official Brazilian estimate. When it was not much more optimistic, prices rose again. And so on.³⁵

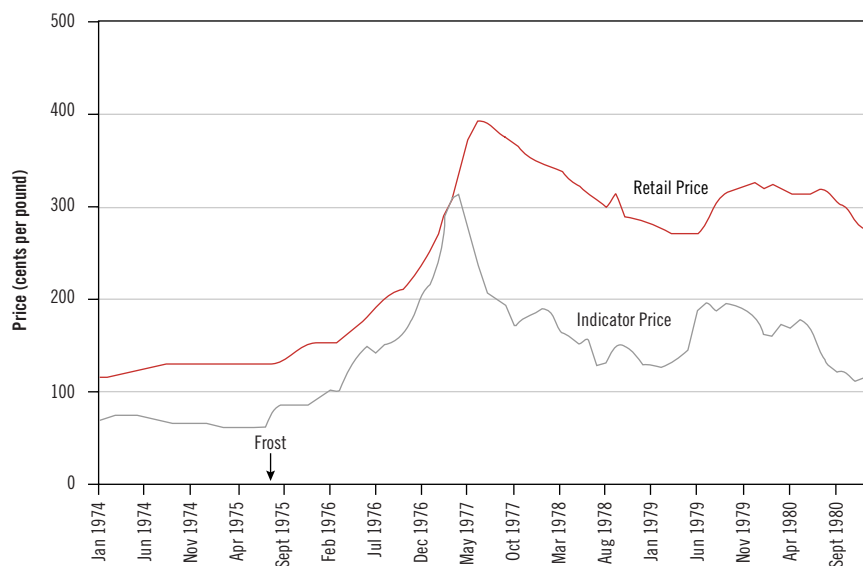
Table 2 above shows Brazilian and total world production and exports for this period. The final production figure for 1995–96 turned out to be closer to the Brazilian NCD estimate than to FAS's. Brazil made up some of the difference from stocks, and its exports were only about 4 million bags lower than in 1994–95. Total world exports were actually higher in 1995–96 than in 1994–95, as other countries, particularly Colombia and the Central American countries increased their exports. They had been building up stocks since the ACPC retention plan had gone into effect in late 1993, and they were able to take advantage of the higher prices and sell off these stocks. By 1996–97, world coffee production had recovered from the period of low prices in 1989–92, and was adequate to meet world demand for the first time in four years. The lower line in Figure 2 shows the ICO indicator price during this period. After a rapid run-up following the frosts, it slowly drifted downward over the next two years.

Comparison

There are several reasons why the reaction of prices to the 1975 frost was more drastic than to the 1994 frost. One was the severity of the frost. The 1975 frost caused more lasting damage to production in Brazil than did the 1994 frost; after the latter one, production recovered to previous levels within a year. Another reason was that Brazil accounted for a lower percentage of total world production in 1994 than in 1975, so the impact of the frost on world coffee supplies was smaller. In addition, there was panic buying at all levels following the 1975 frost: importers, roasters, retailers, and consumers were all hoarding coffee, and that prolonged the run-up of prices. This also caused a steeper decline after prices peaked, because everyone used up their extra supplies before buying more. The Congressional Research Service estimated that this panic buying was the primary factor that drove prices up about twice as high as they would have

³⁵ *New York Times*, June 28, 1994, p. D1; June 29, 1994, p. D1; June 30, 1994, p. D17; July 8, 1994, p. D11; July 9, 1994, p. 43; July 11, 1994, p. D2; July 12, 1994, p. D13; July 26, 1994, p. D16; August 16, 1994, p. D13; *Washington Post*, July 12, 1994, p. C1; *Financial Times*, July 20, 1994, p. 30; July 28, 1994, p. 28; August 13, 1994, p. 12; August 16, 1994, p. 17.

Figure 1 – ICO Indicator Price for Green Coffee and Average Retail Price of Roasted and Ground Coffee, Monthly Average, January 1974 – December 1980



been if they had been based solely on availability of supplies (*New York Times*, November 14, 1977, p. 53). A major reason for the panic buying was uncertainty—no one knew how much coffee would be available, and after many months of price increases, people started to expect the worst. Importers were willing to pay more to be sure of obtaining coffee, and passed the higher prices up along the rest of the commodity chain. As importers and roasters paid the higher prices, they drove futures prices up by hedging their purchases.

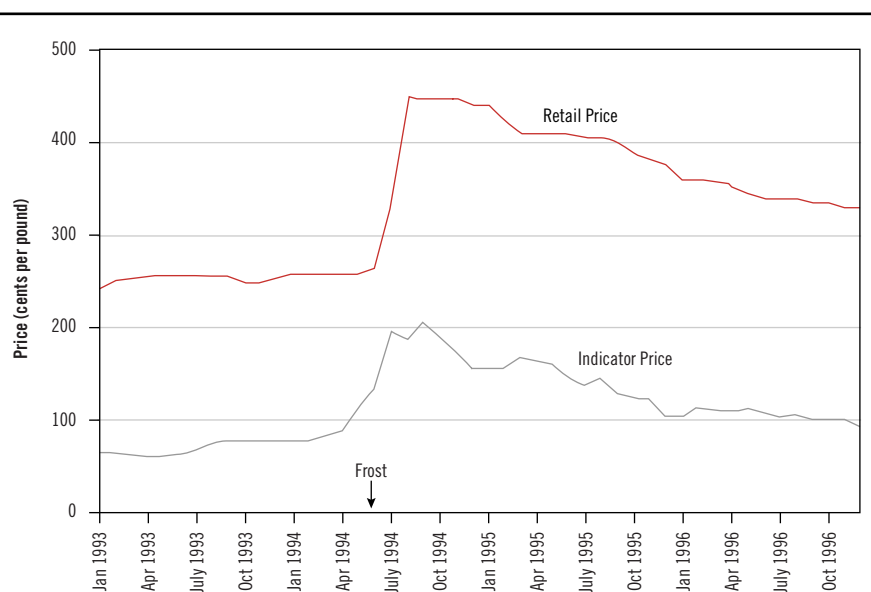
The dynamic following the 1994 frost was completely different. Futures prices jumped immediately, and roasters followed with immediate wholesale price increases that would cover their increased costs of buying green coffee in the future. Traders and roasters had their sources in Brazil, who were closely monitoring the situation. They had a better idea of the extent of the frost damage and of the size and condition of Brazil's coffee stocks than they had been in 1975. In fact, there was almost too much information about conditions in Brazil available in 1994. In addition to the NCD and FAS, there were numerous estimates of the frost damage floating around in 1994. Commodity traders like ED&F Man and GNI published their estimates; analysts such as F.O. Licht published theirs; and even Accu-Weather released one. This plethora of information, and the fact that

commodity funds and other speculators carried much more weight in the futures exchanges in 1994, caused a highly volatile situation in the futures prices. And this was translated into volatility of actual green coffee prices, because by that time the futures price determined the physical price. Despite this volatility, there was no prolonged run-up of prices to cause hoarding. The market was moving much more rapidly; after quickly climbing to a peak only a few months after the frost, futures and green coffee prices quickly began drifting downward. However, wholesale and retail prices remained high.

Another major difference was that there was no attempt by producers to manipulate the market once prices began to decline in 1994, as they had done in 1977–79. The volume of trading on the CSCE was around 10–12,000 contracts per month in 1978; by 1995, it was around 160,00 per month. The expense of trying to squeeze the market in 1995 would have been astronomical. And once again, information systems were much better in 1994. Brazil and El Salvador were able to pull off their operation in 1977 in relative secrecy. There were rumors floating around, but no one really knew what was happening at the time. The details only came out a few years later. Such a level of secrecy would have been impossible in 1994, particularly regarding the buying of large quantities of physical coffee and shipping them from one place to another. In fact, by 1994, the largest traders were in a better position to manipulate the market than states or firms in the producing countries. Their integrated strategies involved both buying physical coffee and speculating, and these could be combined in a variety of ways to their advantage. For example, they might sell futures contracts to lower the price slightly, and then quickly fix the price of some physical coffee that they had bought at the lower price. With the huge amounts of coffee they dealt with, even a movement of a fraction of a cent could generate a significant profit.

But the most striking difference between 1975 and 1994 is revealed by comparing Figures 1 and 2, showing the trajectories of prices surrounding the two frosts. In Figure 1 shows retail coffee prices generally following the trajectory of physical green coffee prices, with a lag. The gap between the two lines narrows from the beginning of 1974 through the point where green coffee prices are roughly equal to retail prices, in March 1977. This shows that, while retail prices were increasing, coffee producing countries were able to increase the share of these prices that they retained. Since it took several months for green coffee to get from the producing countries to the supermarket shelves, the coffee manufacturers were never losing money, but they were being squeezed. However, the gap between the two lines is considerably wider after the prices peaked than it was before. This shows that the roasters more than made up for it on the downside of the price spike. They lowered their wholesale prices, but by a smaller percentage than green coffee prices were falling. The wider gap after the frost already begins

Figure 2 – ICO Indicator Price for Green Coffee and Average Retail Price of Roasted and Ground Coffee, Monthly Average, January 1973 – December 1996



to show the increasing market power of the TNC roasters, who were able to increase their margins even in a falling market.

Figure 2 shows a different pattern. First, the gap between green and retail coffee prices is much larger before the frost in this Figure. This means that producing countries were receiving a much lower percentage of the total income available from coffee sales in the early 1990s than they had in the 1970s. Second, roasters' responses to the increase in green coffee prices were much faster in 1994. In 1975, the first increase in wholesale price was announced by General Foods, eleven days after the frost. In 1994, Folger's increased its prices three days after the first frost struck, and the only reason it took that long was that the frost hit on a Saturday night. There were no futures traded for more than a day after news of the frost was first reported. Futures prices jumped on Monday, the next trading day, and the roasters raised their prices on Tuesday. The phenomenal 42.8% increase in wholesale prices for the month of July stands out in Figure 2, so that the lower line briefly approaches, but comes nowhere near, the upper. Even as green coffee prices were increasing in 1994, producing countries were not able to significantly increase their share of total income. Part of the reason for this was that green coffee and futures prices reached their peak so quickly after the frost,

and began to trend down. And, as was the case following the peak in 1977, the gap between the two lines only grows larger again after prices peak. The differences between these two Figures are literally a graphic illustration of the way the balance of power had shifted away from states and firms in the coffee producing countries and toward the giant coffee TNCs.

CONCLUSION

I have argued that a new form of international inequality has been established, superimposed on the old form. The old form was established during the period of British hegemony in the late 19th Century. It was based in a global division of labor that assigned different areas of the world to different roles in an industrial production system. The position of colonial, semiperipheral, and peripheral regions of the world in this division of labor was primarily one of suppliers of raw materials to the industries of the core countries, and of consumers of their output. This old international inequality was consolidated during the period of US hegemony from World War II up to about 1970. It was updated and modernized for a world that had undergone decolonization. Some routine, labor-intensive manufacturing processes were spun off from the core to the semiperiphery, but they were under the control of core-based TNCs and integrated into their global production systems. Most of the periphery, and sections of the semiperiphery, remained suppliers of raw materials to the core. The old system of international inequality was still firmly in place. After the crisis of the US regime of accumulation, around 1970, a period of financial expansion was initiated. I have argued that during this period, a new form of international inequality has come into being. While the old form relied on control of production processes and the flow of goods, the new form is based on control of capital and flows of information. This new form has been superimposed on the old form, thereby increasing the overall degree of inequality in the world. I have illustrated this argument by considering the case of coffee.

Coffee was one of the central commodities involved in the establishment of the old inequality. It was one of the first commodities produced in mass quantities in the colonies for consumption in the industrial core. A large number of peripheral countries came to depend, and still depend, on the money earned in their roles as suppliers of green coffee to the major consuming markets in the core. Although coffee producers were able to organize, and fared better than the suppliers of many other raw materials, they were still in a disadvantaged, unequal, position in the world division of labor, and were kept there by the economic and political power of the TNCs. The coffee TNCs controlled the flow of coffee into the core markets, its manufacturing, and its distribution. They used this position

to maintain control over a large share of the income and profits generated by the global production system that provided the coffee. After the first frost, producers were able to take advantage of the shortage and the uncertainty to increase their shares of these income and profits. This proved to be only a short-term advantage, and the TNCs were able to more than make up for their losses in the longer term, after prices had begun to come down. But even in a declining market, the producers were able to play the futures markets in order to make a profit and slow the decline somewhat.

Developments during the financial expansion have exacerbated the situation of coffee producers. The TNCs are larger and more powerful, and they have consolidated their hold over the core markets. The states in producing countries are weaker, less able to control the growing and processing of coffee that are carried out within their borders. While a few firms based in the semiperiphery have risen to the status of global TNCs, able to compete with the core-based TNCs, they are the exceptions, and the latest evidence suggests that even they are being squeezed out (Anderson and Cavanagh 2000). During the financial expansion, control over capital and information has become an even more important source of power than control over production and flows of goods. And the coffee TNCs have used this control to further extend their advantage. The price that producers get for their coffee is now tied to the value of paper contracts that depend as much, if not more, on rumor and speculation than on the actual supply and demand conditions for coffee. And with their vast networks of capital and information flows, the TNCs are in a much better position to capitalize on this situation than are coffee producers. During the second frost, the coffee TNCs were able to pull off a pre-emptive strike, raising their prices so quickly that not only did producers not even derive any temporary benefits from the shortage, but their share of overall income and profits declined even further. This is the effect of the new international inequality.

REFERENCES

- Anderson, Sarah, and John Cavanagh. 2000. "Top 200: The Rise of Corporate Global Power." Washington DC: Institute for Policy Studies.
- Arrighi, Giovanni. 1994. *The Long Twentieth Century: Money, Power and the Origins of Our Times*. London: Verso.
- Boletín Cafetera. Manta, Ecuador: Asociación Nacional de Exportadores de Café.
- Chalmin, Philippe. 1987. *Traders and Merchants: Panorama of International Commodity Trading*. Chur, Switzerland: Harwood Academic Publishers.
- Edmunds, John. "A Comment on Greenstone's 'The Coffee Cartel: Manipulation in the Public Interest'" *Journal of Futures Markets* 2 (1): 19–24.
- F.O. Licht. *F.O. Licht's International Coffee Report*. Ratzeburg, Germany, various issues.

- Greenstone, Wayne D. 1981. "The Coffee Cartel: Manipulation in the Public Interest" *Journal of Futures Markets* 1 (1): 3–16.
- Hilke, John C. and Philip B. Nelson. 1989. "Strategic Behavior and Attempted Monopolization: The Coffee (General Foods) Case" in John E. Kwoka and Lawrence J. White (eds.), *The Anti-Trust Revolution*. Glenview IL: Scott, Foresman and Co.
- International Coffee Organization. 1981 *Quarterly Statistical Bulletin on Coffee*, No. 19, July–September. London: ICO.
- International Trade Centre UNCTAD/GATT. 1992. *Coffee: An Exporter's Guide* Geneva: ITC.
- International Trade Centre UNCTAD/WTO. 1996. *Coffee: An Exporter's Guide—Supplement*. Geneva, ITC.
- Kuchiki, Akifumi. 1990. "The Pricing Mechanism of Primary Commodities Since the 1970s" *The Developing Economies* 28 (1): 95–110.
- Landell Mills Commodity Studies. *Commodity Bulletin—Coffee*. Oxford UK, various issues.
- Marazzi, Leonarda. 1984. "Commodity Exchanges: Implications for International Trade" *Trade and Development: An UNCTAD Review* No. 5: 99–120.
- Mattera, Philip. 1992. *World Class Business: A Guide to the 100 Most Powerful Global Corporations*. New York: H. Holt.
- McMichael, Philip. 1996. *Development & Social Change*. Boston: Pine Forge Press.
- Stopford, John. 1992. *Directory of Multinationals*. New York: Stockton Press.
- Talbot, John M. 1997a. "The Struggle for Control of a Coffee Commodity Chain: Instant Coffee from Latin America" *Latin American Research Review* 32 (2): 117–35.
- Talbot, John M., 1997b. "Where Does Your Coffee Dollar Go?: The Division of Income and Surplus Along the Coffee Commodity Chain" *Studies in Comparative International Development* 32 (1): 56–91.
- US Department of Agriculture, Foreign Agricultural Service, *Foreign Agricultural Circular—Coffee*. Washington: Government Printing Office, various years.
- US Department of Agriculture, Foreign Agricultural Service, *Tropical Products: World Markets and Trade*. Washington: Government Printing Office, various years.
- Ward's Private Company Profiles. 1994. Detroit, Gale Research.

GLOBAL ENERGY INEQUALITIES: EXPLORING THE LONG-TERM IMPLICATIONS

Bruce Podobnik

INTRODUCTION

Mainstream energy studies have paid insufficient attention to the unequal levels of energy consumption that have become embedded in the foundations of the world-system. This inattention is problematic, given that these energy inequalities pose increasingly severe environmental and human challenges. In a world characterized by strikingly unequal rates of energy consumption, for instance, it will be difficult to develop collectively rational responses to global climate threats. Furthermore, energy inequalities increase the potential for resource-based geopolitical conflicts. And they foster unhealthy consumption habits throughout the developed world, while preventing entire generations of men, women, and children in the developing world from fully realizing their potential as citizens of the modern world.

Faced with these multiple threats, it is not unreasonable to suggest that energy-related difficulties will begin undermining stability in the world community in coming decades. Indeed, an analysis informed by the world-systems approach highlights contradictions that are likely to generate multiple kinds of energy-related crises in the medium to long term.

In recent years, a variety of researchers working within the world-systems tradition have shed important light on the ways in which the expanding capitalist world-economy intensifies processes of environmental degradation.¹ By



ABSTRACT

This study examines the evolution of global energy inequalities over the modern period, with particular attention paid to the years 1958–1998. The analysis reveals that global energy inequalities were modestly reduced in the 1970s, as semi-peripheral nations increased their consumption of modern energy resources. However, an intensification of inequalities re-asserted itself in the 1980s and 1990s, as the semi-periphery lost

ground in relation to resurgent consumption in core nations such as the United States. The study argues that, in an increasingly bounded energy system, geopolitical, commercial, and social tensions will rise if fundamental inequalities in energy consumption are not addressed. Prospects for achieving reforms in the system over the medium term are evaluated at the conclusion of the study.

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¹ Of particular note are Bunker (1985), Burns, Kick & Murray (1994), and the studies presented in the volume edited by Goldfrank, Goodman, and Szasz (1999).

focusing on the material consequences of capital accumulation and the enduring inequalities fostered by the world-system, these researchers have developed novel analyses of long-term, problematic patterns of evolution in the human/nature nexus. In the analysis that follows, I draw on this research tradition in order to bring a greatly under-examined characteristic of the global energy system into sharper focus—and to examine prospects for reforming inequalities in this energy system.

GLOBAL ENERGY INEQUALITIES

Debates have long raged as to whether or not the world-economy operates as a zero-sum, bounded system in which gains by one country imply losses by another. In the case of the energy foundations of the world-economy the zero-sum, bounded nature of the world-system is quite clear. The fact that 90 percent of the commercial energy consumed in the world derives from non-renewable resources provides one important boundary.² And the fact that global ecological constraints are tightening provides another. Although some elasticity in these boundaries is offered by changing technologies, in fundamental terms the consumption of commercial energy resources by one group implies a future inability to consume for other groups. This zero-sum feature of the world energy system raises particularly severe dilemmas, as highlighted in a global analysis of patterns of energy consumption.

As with most cross-national research, when examining large-scale patterns of energy consumption we are forced to rely on nationally-aggregated data. The limited amount of research that has been conducted at local levels reveals that lower-class citizens, rural residents, women, and minority populations are often forced to rely on traditional, highly-polluting, and labor-intensive forms of energy to meet their basic needs.³ As more research is conducted at the within-country level, our understanding of local and regional inequalities will be strengthened.

² The non-renewable energy resources of coal, petroleum, and natural gas currently provide around 90 percent of the world's commercial energy, while nuclear and hydro-electricity provide most of the rest. It should be noted that the data analyzed in this paper relates exclusively to commercial forms of energy, and does not include traditional resources such as wood (which are estimated to provide under five percent of the world's energy). Consult Appendix A for further information on data sources and methods.

³ See Alam, Sathaye, & Barnes (1998) and Komives, Whittington, & Wu (2000) for examples of these within-country studies.

The present analysis, however, is forced to utilize national data that undoubtedly underestimates true levels of inequality in energy consumption. Given this likely distortion, it is quite remarkable how stark the inequalities are that are registered in nationally-aggregated data.

Let me start with a couple of observations regarding relatively long historical trends in the global energy system. As shown in Figure 1, through the end of WWII the developed world was almost totally self-sufficient in energy.⁴ Since then, however, nations of the global south have been transferring energy resources to nations in the global north at a steady rate. A number of oil-exporting countries have achieved impressive levels of economic growth on the basis of this trade. However, the main effect has been to intensify long-standing global inequalities in levels of energy consumption. As indicated in Figure 2, throughout the modern period core states have attained much higher levels of per capita commercial energy consumption than their semi-peripheral or peripheral counterparts. While there was a slight closing of the gap between core and semi-peripheral regions during the 1970s,⁵ by the mid-1980s long-term patterns of intensifying inequality had reasserted themselves.

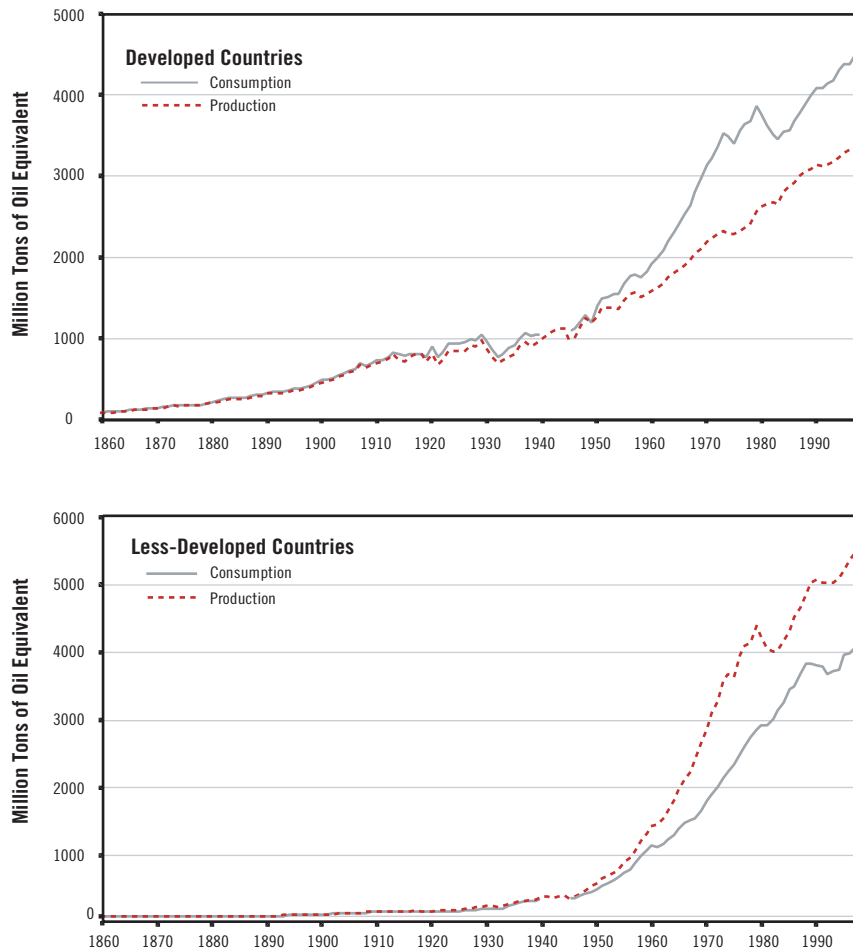
If we focus our attention on the post WWII period, and examine world regions in more detail, we again see enduring patterns of inequality. As shown in Figure 3, North America (the US and Canada) has persistently outstripped all other regions in terms of commercial energy consumption. After seeing substantial gains in the three and a half decades following WWII, meanwhile, countries in Eastern Europe have undergone a significant decline in consumption. Western Europe, which saw a slight pause following the shocks of the 1970s, has reasserted moderate growth. The Pacific region, which includes Japan, East Asia, and Australia, has seen steady growth. Africa and Asia, meanwhile, have seen little increase in per capita consumption of commercial energy since the 1970s.⁶

⁴ Consult Appendix A for information on data sources and methods. It should be noted that the energy data examined in this paper is commercial energy (coal, petroleum, natural gas, nuclear, and hydro-electricity), and does not include traditional resources such as wood.

⁵ Chase-Dunn (1989: 265-266) correctly highlighted the growing share of energy that flowed to certain semi-peripheral states in the pre-1980 period. This pattern reversed itself in the post 1980 period, however, as Eastern Europe declined and core states once again expanded their consumption.

⁶ Consult Table 1 for data on the evolution of per capita consumption rates for selected countries over the period 1958–1998.

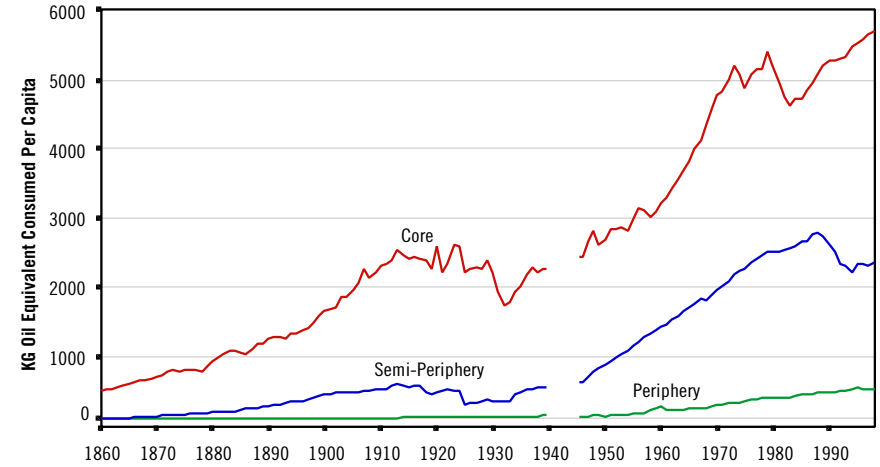
Figure 1 – Commercial Energy Production and Consumption, 1860–1998



Sources: See Appendix A

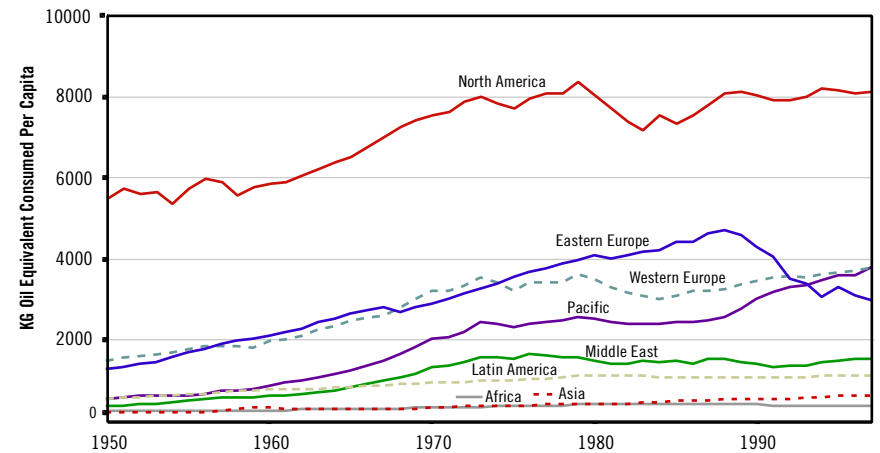
Turning to a more focused analysis of the present situation, we again find that countries exhibit very divergent patterns of energy consumption. As shown in Figure 4, the average citizen in the United States consumes five times as much as the world average, ten times as much energy as a typical person in China, and over thirty times more than a resident of India. Even in such major oil exporting nations as Venezuela and Iran, per capita consumption of commercial energy resources is less than one half and one quarter of the US average, respectively. A

Figure 2 – Per Capita Commercial Energy Consumption, 1860–1998



Sources: See Appendix A.

Figure 3 – Per Capita Commercial Energy Consumption, 1950–1998



Sources: See Appendix A.

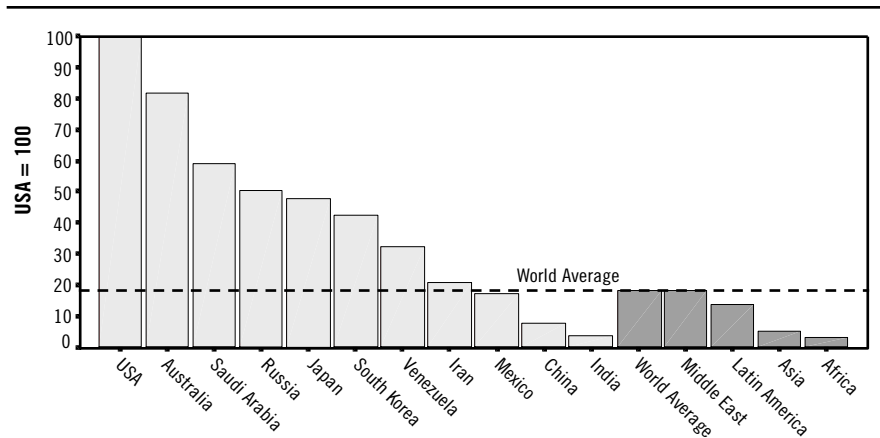
starker illustration of these inequalities is captured in the estimation that around 40 percent of the world’s population—over 2 billion people—still has no regular access to commercial energy products in their homes (World Energy Council 2000).

Table 1 – Per Capita Commercial Energy Consumption for Selected Countries

KG of oil equivalent, commercial energy consumed per capita						Percent change in per capita consumption				
COUNTRY	1958	1968	1978	1988	1999	COUNTRY	1968	1978	1988	1999
UAE	352	3356	16450	19314	15188	UAE	852	390	17	-21
CANADA	4110	6084	8041	8445	8877	CANADA	48	32	5	5
SINGAPORE	563	3748	5735	5338	8700	SINGAPORE	566	53	-7	63
KUWAIT	7085	6104	4293	3525	8407	KUWAIT	-14	-30	-18	139
USA	5583	7239	7970	7890	7960	USA	30	10	-1	1
NETHERLANDS	2511	4418	7123	6081	6801	NETHERLANDS	76	61	-15	12
AUSTRALIA	2599	3551	4457	4607	6480	AUSTRALIA	37	26	3	41
BELGIUM	2653	4218	5693	4855	5914	BELGIUM	59	35	-15	22
SWEDEN	2980	4830	3919	5099	5822	SWEDEN	62	-19	30	14
NEW ZEALAND	1174	2333	2585	3605	4769	NEW ZEALAND	99	11	39	32
SAUDI ARABIA	1808	6171	8503	6166	4715	SAUDI ARABIA	241	38	-27	-24
RUSSIA/USSR	2001	2291	3743	4740	4026	RUSSIA/USSR	15	63	27	-15
FRANCE	1806	2661	3474	3137	3857	FRANCE	47	31	-10	23
JAPAN	557	1721	2735	2463	3821	JAPAN	209	59	-10	55
UK	3026	3499	3818	3671	3753	UK	16	9	-4	2
TAIWAN	288	569	1421	2035	3448	TAIWAN	97	150	43	69
DENMARK	786	2102	2404	3217	3426	DENMARK	167	14	34	7
SKOREA	119	428	847	1675	3388	SKOREA	259	98	98	102
ITALY	846	2311	2702	2417	3156	ITALY	173	17	-11	31
ISRAEL	642	1071	2232	1830	2890	ISRAEL	67	108	-18	58
VENEZUELA	6949	5557	3504	2845	2569	VENEZUELA	-20	-37	-19	-10
SAFRICA	1161	1283	1753	2269	2279	SAFRICA	11	37	29	0
HONG KONG	43	21	583	1354	2273	HONG KONG	-51	2670	132	68
POLAND	1622	2263	3392	3447	2060	POLAND	40	50	2	-40
MALAYSIA	236	279	606	1000	1846	MALAYSIA	19	117	65	85
ARGENTINA	630	1124	1437	1593	1709	ARGENTINA	78	28	11	7
IRAN	1165	1724	2361	1312	1642	IRAN	48	37	-44	25
CHILE	534	1327	1073	930	1394	CHILE	149	-19	-13	50
MEXICO	639	796	1217	1410	1366	MEXICO	25	53	16	-3
NKOREA	390	1046	1416	2104	1331	NKOREA	168	35	49	-37
JAMAICA	93	680	491	912	1300	JAMAICA	632	-28	86	42
IRAQ	345	918	1578	2049	1104	IRAQ	166	72	30	-46
BRAZIL	154	302	628	679	1080	BRAZIL	96	108	8	59
THAILAND	40	159	196	296	877	THAILAND	303	23	51	196
TURKEY	146	335	481	721	876	TURKEY	130	44	50	22
CUBA	580	473	680	765	857	CUBA	-18	44	13	12
COLOMBIA	495	571	600	615	706	COLOMBIA	15	5	3	15
EGYPT	165	248	447	614	681	EGYPT	50	80	37	11
CHINA	215	168	430	564	614	CHINA	-22	156	31	9
PERU	258	366	535	486	485	PERU	42	46	-9	-0
ZIMBABWE	641	331	329	387	473	ZIMBABWE	-48	-1	18	22
INDONESIA	151	127	216	338	402	INDONESIA	-16	70	57	19
BOLIVIA	102	153	298	205	374	BOLIVIA	50	95	-31	82
ELSALVADOR	105	157	268	244	357	ELSALVADOR	49	71	-9	46
PHILIPPINES	109	233	238	281	333	PHILIPPINES	114	2	18	18
INDIA	64	103	126	201	292	INDIA	61	22	60	45
HONDURAS	107	142	157	183	266	HONDURAS	33	11	17	45
IVORY COAST	36	141	222	318	252	IVORY COAST	295	57	43	-21
ZAMBIA	58	516	315	168	242	ZAMBIA	788	-39	-47	44
GUATEMALA	103	144	127	96	236	GUATEMALA	41	-12	-25	147
NIGERIA	11	53	178	171	183	NIGERIA	402	236	-4	7
GHANA	71	117	129	111	142	GHANA	65	10	-14	28
KENYA	39	184	192	118	121	KENYA	366	5	-39	3
ZAIRE	26	48	67	39	12	ZAIRE	87	39	-41	-71

Sources: See Appendix A.

Figure 4 – Per Capita Commercial Energy Consumption Relative to USA, 1998



Sources: See Appendix A.

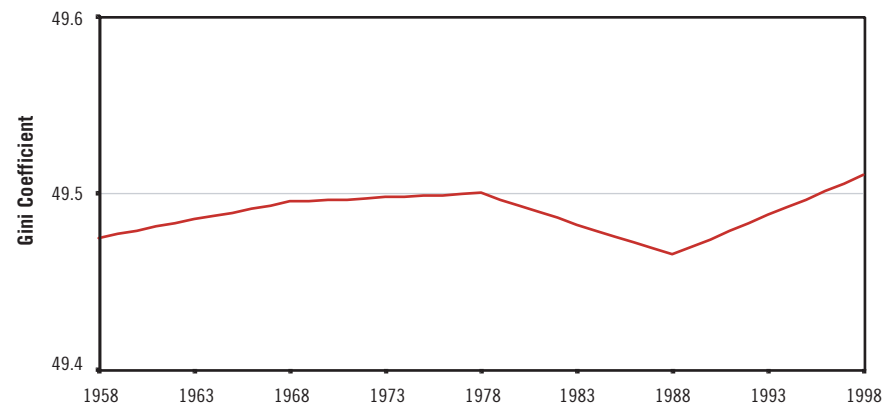
It must also be observed that these unequal patterns of consumption show little sign of easing. This can be demonstrated through two related techniques: a gini-style analysis, and a quintile-based analysis.

The gini-style analysis has the advantage that it compares the relationship between every individual country's per capita energy consumption and its population size. It therefore makes full use of country-level information. It has one disadvantage, however, in that the scale of the graph used largely determines the image conveyed. Take Figure 5, for instance. Here the evolution of the world energy gini coefficient over the period 1958-1998 is charted, focusing in on a very small band on the y-axis.⁷ As shown at this very focused scale, during the period 1978-1988 the gini coefficient got slightly smaller—meaning that world commercial energy consumption was becoming slightly more equitable. The post-1988 period, however, saw a relatively rapid return to a longstanding pattern of inequality.

While serving the useful purpose of highlighting a modest pause in the overall trend, the gini analysis has the potential to over-emphasize quite minor changes. Changing the y-axis to cover a range from 49.0 to 50.0, for instance,

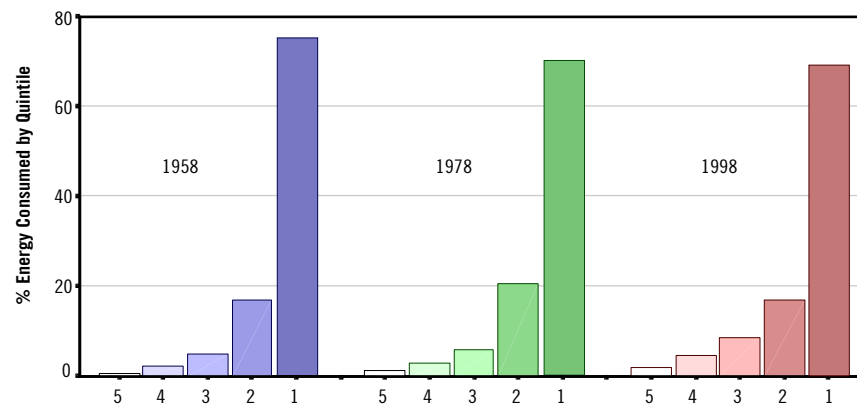
⁷ That is to say, the gini coefficient range from 49.4 to 49.6 is extremely small. See Appendix A for a description of exactly how the world energy gini coefficient was calculated.

Figure 5 – World Energy Gini Coefficient, 1958–1998



Sources: See Appendix A.

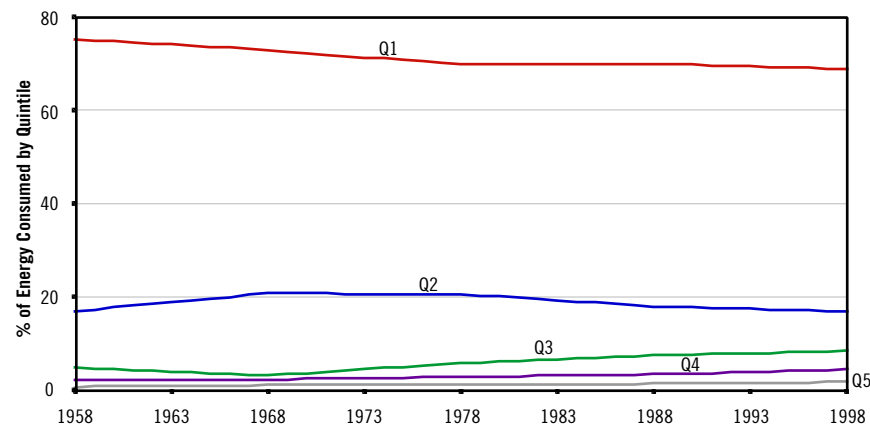
Figure 6 – World Commercial Energy Consumption by Quintiles



Sources: See Appendix A.

results in a largely horizontal line (which would emphasize an unchanging distribution of energy consumption). It is possible to guard against an overly-sensitive gini analysis by performing a breakdown by quintile groups. This method is based on a five-category aggregation of countries, and so it makes less full use of individual country-level data. Nevertheless, by providing a more structured set of categories to compare over time, it is less sensitive to presentational decisions.

So, what does the quintile analysis show us? As shown in Figure 6, in 1998 the top quintile (containing the wealthiest 20 percent of the world's population)

Figure 7 – World Commercial Energy Consumption by Quintiles

Sources: See Appendix A.

consumed about 68 percent of the world's commercial energy, while the lowest quintile consumed under 2 percent of these resources. Figure 7 shows how these categories have evolved over time. The following patterns can be identified: the proportion of energy consumed by the top quintile fell slightly during the period 1958-1978, and then largely remained steady; the second quintile saw gains up to 1978, then fell slightly; the third quintile has seen some growth in the post-1968 period; and the fourth and fifth quintiles have seen very limited growth in the post-1958 period.

There are a couple of noteworthy points to make about this quintile analysis. First, the overall endurance of inequality is again remarkable. Within this overall continuity, however, we can again identify slight modulations. Specifically, the upper middle group (the upper end of the semi-periphery) has seen its share of commercial energy consumption decline since the late 1960s. At the same time, the middle group (the lower end of the semi-periphery) has seen its share increase slowly but steadily. This reflects the fact that part of the semi-periphery (mainly Eastern Europe) has seen its energy consumption rates slip, while another part (East Asia) has increased its proportional energy consumption in the post-1968 period. This suggests that the semi-peripheral pattern identified by Chase-Dunn (1989: 265) may need to be slightly modified, to take into account diverging fortunes within that category of countries in the post-1970 period.

In sum, though there has been a slight change in the relative share of the world's commercial energy resources going to the second and third quintiles, the overall distribution has remained fundamentally unaltered in the post-1958 period. One of the central challenges facing the world community in this cen-

tury will be to begin to alter these embedded patterns of inequality in the global energy system.

ENVIRONMENTAL IMPLICATIONS

While many people in the developing world struggle to gain access to modern energy technologies, citizens and companies in the global north are generally consuming energy resources at an unsustainable rate. The high levels of energy use found in wealthy countries are the source of most of the greenhouse gases emitted into the atmosphere today.⁸ In contrast, most citizens in the global south produce relatively modest energy-related greenhouse emissions. Since these gases remain in the atmosphere for long periods of time, it should also be noted that nations of the developed north have emitted most of the total anthropogenic greenhouse gases that have accumulated in the atmosphere over the last two centuries.

Scientific evidence continues to mount that greenhouse gases generated by human activities are having detrimental impacts on local, regional, and global eco-systems. For instance, the most recent report of the Intergovernmental Panel on Climate Change (IPCC 2001) concludes that most of the global warming observed over the last 50 years can be attributed to human activities. The report also provides evidence to suggest that this warming trend is likely to have more severe environmental and human consequences than had been predicted only a few years ago. In short, the ecological boundary surrounding the global energy system is turning out to be much tighter than expected.

With the scientific consensus suggesting that dangerous climatic dynamics are already being triggered, it becomes imperative to contain greenhouse gas emissions on a global scale at the earliest opportunity. Unfortunately, the difficulties inherent in achieving such a policy objective are exacerbated by the inequalities embedded in the world energy system. Let us pause to examine the startlingly unequal emissions rates that derive from these unequal patterns of consumption.

It has been suggested that the most equitable approach to addressing the problem of global climate change would be to define a standard per capita emissions rate, and then levy penalties on nations that exceed the standard (Meyerson

⁸ Greenhouse gases primarily include carbon dioxide, methane, and nitrous oxide—all of which are by-products of fossil-fuel consumption (though there are other sources of these gases as well). See IPCC (2001) for a recent summary on greenhouse gases and global climate change.

Table 2 – Comparison of 1990 Target Carbon Emissions Rates to Actual 1998 Carbon Emissions.

Country	1990 Target	1998 Actual	Ratio	Country	1990 Target	1998 Actual	Ratio
UAE	2	31	15.16	SWITZERLAND	7	12	1.61
BAHRAIN	1	5	8.97	SWEDEN	9	15	1.58
SINGAPORE	3	25	8.34	BULGARIA	9	14	1.45
USA	277	1494	5.38	MALAYSIA	20	28	1.41
KUWAIT	2	12	5.09	HUNGARY	11	15	1.31
CANADA	31	138	4.48	IRAN	62	79	1.28
AUSTRALIA	19	83	4.39	PORTUGAL	11	14	1.28
NETHERLANDS	17	65	3.92	RUSSIA	339	405	1.19
SAUDI ARABIA	18	63	3.60	MEXICO	93	95	1.03
BELGIUM	11	38	3.44	Countries Equal to or Under IPCC Recommended Threshold			
ISRAEL	5	15	2.91	Country	1990 Target	1998 Actual	Ratio
DENMARK	5	16	2.81	ARGENTINA	36	36	1.00
TAIWAN	22	58	2.65	CHILE	15	14	.96
GERMANY	89	227	2.55	IRAQ	20	19	.95
SOUTH AFRICA	41	101	2.46	TURKEY	62	47	.76
FINLAND	6	13	2.35	THAILAND	62	42	.68
NORWAY	5	11	2.34	CHINA	1259	740	.59
UK	64	147	2.30	EGYPT	58	31	.53
SOUTH KOREA	48	107	2.25	BRAZIL	164	84	.51
GREECE	11	25	2.22	COLOMBIA	37	17	.46
NEW ZEALAND	4	8	2.15	ZIMBABWE	11	4	.37
JAPAN	137	288	2.10	INDONESIA	198	67	.34
HONG KONG	6	12	1.90	INDIA	942	252	.27
ITALY	63	119	1.89	NIGERIA	107	27	.25
AUSTRIA	9	16	1.87	PHILIPPINES	68	17	.25
POLAND	42	77	1.82	PAKISTAN	125	26	.21
SPAIN	43	75	1.74	BANGLADESH	122	6	.05
VENEZUELA	21	37	1.73				
FRANCE	63	106	1.69				

See Appendix A for sources.

1998). Enshrined within the United Nations Framework Convention on Climate Change is one such standard that could be applied in this kind of calculation. Specifically, the Framework Convention states that anthropogenic carbon dioxide emissions should be stabilized at 1990 levels. This 1990 target level is largely symbolic, since it is not assumed to be capable by itself of forestalling significant global warming. Furthermore, it has not been formally ratified by anything approaching a majority of the world's governments. It has nevertheless come to represent the first widely promulgated threshold relating to a major greenhouse gas. As such, it provides one standard upon which to compare the behavior of countries across the world.

Table 2 carries out an analysis designed to show how actual 1998 carbon emission rates for each country compare to their 1990 target levels. The calculations involved are quite simple. First, note that estimated world anthropogenic carbon emissions totaled 5.832 billion metric tons of carbon dioxide in 1990 (US EIA 1999). The world's population, meanwhile, totaled 5.260 billion people in 1990. The UNFCCC target rate, therefore, theoretically allows every person on the planet to emit roughly 1.12 metric tons of carbon per year. Given this per-person theoretical emission allowance, each country's cumulative target rate can be calculated by multiplying its population by 1.12. Carrying these multiplications out for the year 1990 then gives us the population-weighted target levels for each country, consistent with the UNFCCC threshold. In the case of the United States, for example, we multiply 1.12 by 249.8 million (the US population in 1990) to get a 1990 carbon target level of 277 million metric tons. This is the amount of carbon the US population could emit, consistent with the UNFCCC target, on a yearly basis for an interim period.

Of course, few countries emit the amount of carbon dioxide suggested by the 1990 target. Many poor countries emit less than their population-weighted theoretical allowance, while many wealthy countries emit much more than their population-weighted allowance. A ratio can be computed to reflect precisely how far any country is from their UNFCCC theoretical allowance for any given year (remembering that the 1990 level is supposed to be fixed over time). To calculate the ratio we just take the actual carbon emission level of a country for a particular year and divide it by that country's 1990 target rate.⁹ The higher the ratio, the more severely a country is exceeding its population-weighted 1990 theoretic-

⁹ In Table 2, the numbers in the '1990 Target' and '1998 Actual' columns have been rounded. However, the ratio numbers were calculated on un-rounded numbers.

cal allowance. A ratio of 1 (attained only by Argentina in 1998) signifies that a country is emitting at exactly its theoretical allowance. And a ratio of less than one signifies that a country is emitting less than its population-weighted 1990 theoretical allowance.

As can be seen in Table 2, energy consumption inequalities translate into substantially different rates of greenhouse gas emissions across the world. Just as the United States consumes 5 times the global average, it also emits over 5 times more carbon than theoretically allowed for by the UNFCCC threshold. Canada and Australia exhibit quite elevated carbon emission rates, while even Japan emits twice its theoretical allowance. Overall, a broad band of West European countries emit 2 or 3 times more carbon than suggested by the UNFCCC guidelines. Interestingly, though, a handful of core nations (Italy, Austria, France, Switzerland, and Sweden) come close to attaining their symbolic emissions allotments. Broadly speaking, semi-peripheral nations generally approximate the UNFCCC threshold, while peripheral nations (including China and India) emit far below their symbolically allotted rates.

The data presented in Table 2 suggest how politically difficult it would be to implement an equitable approach to global carbon reduction. In order for most core nations to approach their per capita global emissions norm, they would have to reduce their commercial energy consumption levels by factors of 3, 4, or 5. Moreover, these reductions would have to be achieved in a context in which per capita emissions from peripheral nations were allowed to rise towards the global threshold. In other words, the historically-ingrained transfer of resources characteristic of the world energy system would have to be reversed. Nothing short of a fundamental change in the material structures and political culture of the world-system itself would be required to attain an equitably distributed allotment of energy consumption rights.

In the absence of significant reform, the contradictions originating from unequal patterns of energy consumption in this zero-sum, ecologically-bounded system promise to heighten tensions in coming years. These tensions are already manifesting themselves in increasingly acrimonious negotiations at global climate conferences. But they will surely manifest themselves as heightened political, commercial, and social competition as well, as discussed in the next section of this paper.

LONG-TERM GEOPOLITICAL, COMMERCIAL, AND SOCIAL IMPLICATIONS

Though prone to neglect dimensions of inequality, mainstream energy analyses have paid a great deal of attention to the ways in which competition for access to energy resources has influenced dynamics of geopolitical rivalry in the modern

era.¹⁰ Additionally, there is a well-developed literature which describes the competitive struggles pursued by private energy corporations in the twentieth century.¹¹ Even given these extensive bodies of research, however, it is important to note that world-systems researchers have still been able to shed new light on geopolitical and commercial dynamics surrounding extractive industries.

By engaging in comparative historical research, for instance, Stephen Bunker and his colleagues¹² have shown that the tendency of ascendant core states to engage in competitive struggles for access to raw materials has been a central feature of the world-economy since at least the sixteenth century. They have also drawn attention to the fact that attempts to achieve national economic ascent involve the extraction of natural resources in processes that are disrupting fragile eco-systems across the world. Far from reflecting any widespread process of dematerialization, these national development efforts continue to involve the appropriation of tremendous volumes of raw materials by specific social groups—most often to the detriment of other segments of society.

The operation of these extractive dynamics has taken on particularly severe forms in the case of modern energy sectors. For instance, it is widely acknowledged that competition for access to South East Asian oil resources was a fundamental cause of warfare between the US and Japan in WWII. Similarly, the largest military conflict in the post-Cold War era—the Persian Gulf War—was motivated primarily by competition for control over one of the world's key reserves of petroleum. And every indication is that competition for petroleum will generate renewed geopolitical tensions on both regional and global levels in the coming decades, as resource and ecological boundaries draw tighter.¹³

It is important to note that over 70 percent of the world's proven reserves of petroleum, and over 75 percent of known natural gas reserves, are located in the Middle East and Central Asia.¹⁴ As petroleum and natural gas reserves in other parts of the world become depleted during the coming decades, developing

¹⁰ For particularly useful studies on the geopolitical dimensions of energy issues, see Vernon (1983), Bromley (1991), and Yergin (1991).

¹¹ See Penrose (1968) and Moran (1987), for instance.

¹² Bunker and Ciccantell (1999) contains a list of additional studies completed by this group of researchers.

¹³ See Podobnik (2000: chapter 3) for a more detailed examination of the ways in which competition for access to energy resources have influenced dynamics of geopolitical rivalry in the modern era.

¹⁴ These estimates of proven petroleum and natural gas reserves come from British Petroleum (1998) and World Energy Council (1999).

nations such as China will be forced to turn towards Middle Eastern and Central Asian oil and gas resources to satisfy their growing domestic demand (Ogutcu 1998; Xu 2000). This will bring large nations in the global south, which have historically consumed very small quantities of petroleum, into direct competition with nations of the global north. Though there is uncertainty as to exactly when depletion effects will begin hitting Middle Eastern and Central Asian reserves, it appears likely that, under rising demand pressure from both core and peripheral nations, the pools of low-cost oil and gas located in these regions will themselves begin to run dry sometime during the 2030-2070 period. As resource constraints tighten, the material inequalities embedded in the international petroleum system are then likely to become a potent source of geopolitical tension.

Growing reliance on petroleum and natural gas resources from the Middle East and Central Asia is also likely to expose the world-economy to substantial financial vulnerability. As argued in recent studies,¹⁵ countries in these regions are likely to be convulsed by political and social unrest in the coming decades. This suggests that price volatility will regularly emanate from the world's key sources of conventional energy, at a time when depletion effects are likely to begin placing sustained upward pressure on oil and gas prices throughout most of the rest of the world (Pindyck 1999). If deregulation continues to sweep through global electricity markets, another source of market volatility will be added to this already uncertain commercial environment.

Recent experience has revealed that inflationary trends in global energy markets can rapidly undermine conditions for capital accumulation in broad regions of the world-economy. In over 35 countries energy imports exceed 10% of the value of their exports, and so even modestly elevated global energy prices can quickly generate serious trade deficits (IMF 2000). Even in core nations such as the United States, spikes in electricity prices have led to substantial commercial and political unease.

It certainly remains the case that, as world-systems researchers have repeatedly pointed out, prices of raw materials such as energy fundamentally impact rates of profit and capital accumulation in virtually all sectors (Barham, Bunker, and O'Hearn 1994: 5). In this regard, the "new economy" is not so different from the old economy. Indeed, given their high level of demand for uninterrupted electricity, information-based industries may be more acutely sensitive to the cost

¹⁵ See studies conducted by the National Intelligence Council (2000) and the Center for Strategic and International Studies (2001) for discussion of this point.

and reliability of energy inputs than many traditional industries (Feder 2000). The most advanced sectors of modern economies, in short, are not likely to be able to escape the commercial turbulence generated by tightening constraints emerging in conventional global energy industries.

In addition to the mounting possibility that geopolitical tensions and commercial instability will be generated by global energy inequalities, there are also problematic social dynamics that may kick into effect as well. Most importantly, it is not at all clear that the relatively soft constraints represented by environmental regulations can remain resilient in the face of growing supply difficulties in global energy industries.

While public support for stronger environmental regulations has been widespread in core countries during the economic upturn of the 1990s, it is unclear how strong these environmental commitments will prove to be during periods of crisis in energy sectors. Recall that, following the temporary oil price hikes of 2000-2001, protests against energy taxes swept across Western Europe. Though labor and green political representatives tried to defend the taxes on the basis of their environmental benefits, in most cases these taxes were reduced in the face of consumer anger (Barnard 2000). Similarly, in the context of the current electrical crisis that is assailing California, political and corporate leaders are calling for suspension of some federal and state regulations in order to allow for increased electricity production in conventional and nuclear-powered stations (Booth 2001).

If public commitment to environmental regulations proves to be soft in core nations during a time of relative affluence, then this has ominous implications for the viability of such regulations in developing countries throughout the world. Wallerstein's (1999) suggestion that reformist environmental regulations will prove ineffective in containing the ecologically destructive tendencies of the capitalist world-system may well end up being correct. What is certain is that a time of significant challenges to environmental achievements will come as the contemporary global economic expansion ends, competition for increasingly scarce conventional fuels intensifies, and the costs of climate change begin to mount.

PROSPECTS FOR THE FUTURE

There are many reasons to be pessimistic about the future evolution of the global energy system. Indeed, analysts from diverse ideological perspectives argue that fundamental changes in contemporary patterns of energy use cannot be made and that catastrophe is inevitable. Still, as Bunker and Ciccantell (1999: 120) point out, it is important not to underestimate the ability of capitalist firms to innovate and adapt to new material circumstances. And, it is certainly prema-

ture to assume that concerted political and social pressures for equitable reforms would be unable to move the global energy system towards a more collectively rational trajectory.

In this last section, one possible scenario of true reform—resulting from a particular conjuncture of systemic dynamics—is described. Whether it will materialize is partly dependent on broad structural forces beyond the control of individual nations, and partly dependent on the ability of state planners, corporate leaders, and broad groups from civil society to push for reform. In this respect, we have arrived at the classically ambiguous conclusion found in most world-systems analyses: though structural processes of evolution are leading in dangerous directions, there is at least some possibility that human agency can have unusually powerful effects precisely because we find ourselves in a crisis period.¹⁶

As discussed in the previous section, geopolitical rivalries for dwindling conventional energy resources are likely to fuel serious conflicts between ascendant states and long-established core powers (CSIS 2001). It also appears, however, that these same dynamics of geopolitical rivalry are spurring some states to fund new energy technology development programs. State agencies in the United States, Western Europe, and Japan, for instance, have already sponsored joint projects with private corporations to commercialize a variety of new energy systems in this decade. Underlying these efforts is a pressing need to find new ways to utilize the extensive networks of government laboratories that, during the post-WWII era, specialized in the development of nuclear weapons and delivery systems.¹⁷ One unanticipated consequence of contemporary efforts to legitimize continuing public support for military-industrial complexes may therefore be to foster more innovative patterns of state intervention in energy sectors during the coming decades.

Similarly, rising prices in petroleum and natural gas industries will stimulate a renewed wave of capital investments in conventional energy sectors—thereby partially reinforcing business-as-usual commercial dynamics. At the same time, however, rising conventional energy prices will stimulate interest in alternative energy technologies. In this context, it is important to note that a tremendous

¹⁶ See Wallerstein (1999) and Boswell and Chase-Dunn (2000: chapter 6) for particularly useful descriptions of the complexities inherent in these bifurcation points in world history.

¹⁷ See Nakaoka (1994), Sissine (1999) and US General Accounting Office (1999) for surveys of government-supported efforts to commercialize new energy technologies.

amount of innovation is occurring in a variety of alternative energy sectors. Indeed, new kinds of business ventures—which link small engineering firms such as Ballard Power with long-established automotive and petroleum corporations—are fostering rapid commercial advances in new wind, solar, and fuel cell technologies.¹⁸ Through such cooperative, multi-firm joint efforts, resistance encountered in the market place can be more effectively countered. Historical and contemporary trends therefore suggest that competitive dynamics can indeed foster the entrepreneurial and organizational innovations required for the commercialization of a variety of new energy technologies.

There is an additional factor that is likely to enhance dynamics of innovation in global energy industries. In contrast to the global energy shifts of the nineteenth and twentieth centuries, future energy transitions may be facilitated by the existence of multilateral agencies that can assist in setting common agendas and coordinating policies undertaken by individual governments. Although organizations such as the World Bank and the International Energy Agency have long directed the bulk of their institutional support towards conventional energy systems, there are indications that these organizations are in the process of modifying their priorities. As a result of pressure from non-governmental organizations, for instance, the World Bank recently committed itself to increasing funding for environmentally sustainable energy projects (World Bank 1999). Multilateral institutions are also assisting in national efforts to reduce subsidies to conventional energy industries throughout the world. If the field of energy pricing can be leveled through these national and international policy efforts, possibilities for a shift towards greater reliance on new energy technologies will be significantly improved.

What is still missing from contemporary efforts at generating innovative changes in the global energy system, however, is any concerted attempt to reduce enduring energy inequalities by reigning in habits of over-consumption found in many core countries. It is here that groups rooted in civil society, such as consumer and environmental movements, have an important role to play. Such movements have demonstrated in practice that they have the capacity to alter the trajectories of energy sectors, by mobilizing against nuclear power and by pushing for tighter environmental regulations on conventional sectors in many regions of the world.¹⁹ Now they must not only strengthen their defense of

¹⁸ See Srinivasan, et al. (1999) Worrell, et al. (2001), and Podobnik (2000: 254) for discussions of private-sector investments in new energy systems.

¹⁹ See Rudig (1990), Nilsson & Johansson (1994), and Podobnik (2000: chapter 5) for discussions of the impact of social movements on global energy industries.

existing regulatory controls, but they must also work to transform cultural propensities to over-consume energy resources that are found in such countries as the United States, Canada, and Australia (Nye 1999). Behind these intentional efforts at reform, meanwhile, lies what might be a more powerful source of social pressure for fundamental change in the global energy system. Escalating social tensions in the Middle East and Central Asia may in the end prove to be the key, unintended factor propelling the system in innovative directions in the twenty-first century.

There are clearly inherent uncertainties in the manner in which geopolitical, commercial, and social dynamics will interact in coming decades. What is clear, however, is that the massive inequalities embedded in the global energy system must begin to be reformed if potentially dire trends are to be avoided. Whether or not this process can be initiated soon will have a tremendous impact on determining whether the world can move in a collectively rational direction regarding energy policy, or whether we will become caught in escalating energy-related crises in this century.

APPENDIX A: ENERGY DATA SOURCES AND METHODS

The analyses undertaken in this paper are based on data covering coal, petroleum, natural gas, nuclear, hydro, geothermal, and alternative energy industries for the period 1800-1998. The following sources were drawn upon for the production and consumption data: 1) for the period 1860-1949: Etemad and Luciani 1991, *World Energy Production 1800-1985*; and 2) for the period 1950-1997: *The United Nations Energy Statistics Database*, 1997 edition, provided in the annual volumes published by the United Nations, entitled *Energy Statistics Yearbooks*, and supplemented by updated computerized files provided by the United Nations Energy Statistics Unit. Some additional consumption data for the years 1925-1949 were taken from the United Nations publication *World Energy Supplies in Selected Years, 1929-1950* (UN 1952) and from Darmstadter et al., *Energy in the World Economy* (1971).

Where missing data has been estimated, the method of linear interpolations between specific country data points has been used. This method is judged to be reasonable, given the fact that national patterns in energy production and consumption generally follow smooth trajectories. The method of linear interpolation is widely used in the construction of other energy data sets. Because of severe missing data problems during the years 1940-1945, the series on consumption were left as missing during this period.

Reliability checks were carried out on the energy data files. Specifically, the United Nations data has been cross-checked with information provided in

International Energy Agency energy publications, the US Energy Information Administration's *Annual Energy Review*, and the *British Petroleum Survey of Energy Resources*. These comparisons reveal a very high level of reliability.

In calculating the world energy gini coefficient, each year was calculated separately. First, for each country a variable (*perpop*) was calculated—equal to the percent of the world's population represented by that country in that year. Second, for each country a variable (*perenc*) was calculated—equal to the percent of world commercial energy consumption represented by that country in that year. The gini coefficient for each year was then calculated using this formula:

$$Gini = 0.5 * (\text{sum of absolute values of } (perpop - perenc) \text{ for all countries in that year}).$$

In notational form:

$$Gini = 0.5 * (|perpop1 - perenc1| + |perpop2 - perenc2| + \dots + |perpopN - perencN|)$$

where *perpop1* is percent of world population in country 1, and *perencN* is percent of world energy consumed in country N.

See Podobnik (2000) or contact author <podobnik@lclark.edu> for a more detailed discussion of data sources and methods, as well as descriptions of exactly which countries are included in global regional categories used.

REFERENCES

- Alam, Manzoor, Jayant Sathaye, & Doug Barnes. 1998. "Urban Household Energy Use in India: Efficiency and Policy Implications," *Energy Policy*, 26, pp. 885–891.
- Barham, Bradford, Stephen Bunker, & Denis O'Hearn. 1994. "Raw Material Industries in Resource-Rich Regions," pp. 3–38 in: Bradford Barham, Stephen Bunker & Denis O'Hearn (Eds.) *States, Firms, and Raw Materials: The World Economy and Ecology of Aluminum*. Madison, WI: University of Wisconsin Press.
- Barnard, Bruce. 2000. "Trucking Battle Over, but War Goes On," *Journal of Commerce*, Sept. 18.
- Boswell, Terry, & Christopher Chase-Dunn. 2000. *The Spiral of Capitalism and Socialism: Toward Global Democracy*. Boulder, CO: Lynne Rienner Publishers, Inc.
- Booth, William. 2001. "California Pollution Laws Blamed in Crisis," *Washington Post*, Feb. 10.
- British Petroleum Company. 1998. *BP Statistical Review of World Energy*. London: British Petroleum Company.
- Bromley, Simon. 1991. *American Hegemony and World Oil*. University Park, PA: Pennsylvania State University Press.
- Bunker, Stephen. 1985. *Underdeveloping the Amazon: Extraction, Unequal Exchange, and the Failure of the Modern State*. Urbana, IL: University of Illinois Press.

- Bunker, Stephen, & Paul Ciccantell. 1999. "Economic Ascent and the Global Environment: World-Systems Theory and the New Historical Materialism," pp. 107–122 in: Walter Goldfrank, David Goodman & Andrew Szasz (Eds.) *Ecology and the World-System*. Westport, CN: Greenwood Press.
- Burns, Thomas, Edward Kick, David Murray, & Dixie Murray. 1994. "Demography, Development and Deforestation in a World-System Perspective," *International Journal of Comparative Sociology*, 35, pp. 221–239.
- Chase-Dunn, Christopher. 1989. *Global Formation: Structures of the World-Economy*. Cambridge: Basil Blackwell.
- CSIS (Center for Strategic and International Studies). 2001. *The Geopolitics of Energy into the 21st Century*. Washington, DC: CSIS.
- Darmstadter, Joel, Perry Teitelbaum, & Jaroslav Polach. 1971. *Energy in the World Economy: A Statistical Review of Trends in Output, Trade, and Consumption Since 1925*. Baltimore, MD: Johns Hopkins Press.
- Etemad, Bouda, & Jean Luciani. 1991. *World Energy Production 1800–1985*. Geneva: Librairie DROZ.
- Feder, Barnaby. 2000. "Digital Economy's Demand for Steady Power Strains Utilities," *New York Times*, July 3.
- Goldfrank, Walter, David Goodman, and Andrew Szasz (eds). 1999. *Ecology and the World-System*. Westport, CN: Greenwood Press.
- Intergovernmental Panel on Climate Change. 2001. *Third Assessment Report of Working Group 1*. Shanghai: UN IPCC.
- International Monetary Fund. 2000. *The Impact of Higher Oil Prices on the Global Economy*. Washington, DC: IMF.
- Komives, Kristin, Dale Whittington, & Xun Wu. 2000. "Energy Use Around the World—Evidence From Household Surveys," *Energy and Development Report*, 2000, pp. 14–24.
- Meyerson, Frederick. 1998. "Population, Carbon Emissions, and Global Warming: The Forgotten Relationship at Kyoto," *Population and Development Review*, 24, pp. 115–130.
- Moran, Theodore. 1987. "Managing an Oligopoly of Would-Be Sovereigns: The Dynamics of Joint Control and Self-Control in the International Oil Industry Past, Present, and Future," *International Organization*, 41, pp. 575–607.
- Nakaoka, Akira. 1994. "Current Status of NEDO's Fuel Cell Power Generation Technology R&D," *Japan 21st*, Nov., pp. 24–26.
- National Intelligence Council. 2000. *Global Trends 2015: A Dialogue About the Future With Nongovernment Experts*. Washington, DC: National Intelligence Council.
- Nilsson, Lars, & Thomas Johansson. 1994. "Environmental Challenges to the Energy Industries," pp. 47–79 in: Nicola Steen (Ed.) *Sustainable Development and the Energy Industries: Implementation and Impacts of Environmental Legislation*. London: Earthscan Publications.
- Nye, David. 1999. "Path Insistence: Comparing European and American Attitudes Toward Energy," *Journal of International Affairs*, 53, pp. 129–148.

- Ogutcu, Mehmet. 1998. "China and the World Energy System: New Links," *Journal of Energy and Development*, 23, pp. 281–318.
- Penrose, Edith. 1968. *The Large International Firms in Developing Countries: The International Petroleum Industry*. London: Allen & Unwin.
- Pindyck, Robert. 1999. "The Long-Run Evolution of Energy Prices," *Energy Journal*, 20, pp. 1–27.
- Podobnik, Bruce. 2000. *Global Energy Shifts: Future Possibilities in Historical Perspective*. Ann Arbor, MI: UMI Dissertation Services.
- Rudig, Wolfgang. 1990. *Anti-Nuclear Movements: A World Survey of Opposition to Nuclear Energy*. London: Longman Group.
- Sissine, Fred. 1999. *Renewable Energy: Key to Sustainable Energy Supply*. Washington, DC: Congressional Research Service.
- Srinivasan, Supramaniam, Renaut Mosdale, Philippe Stevens, & Christopher Yang. 1999. "Fuel Cells: Reaching the Era of Clean and Efficient Power Generation in the Twenty-First Century," *Annual Review of Energy and the Environment*, 24, pp. 281–328.
- United Nations. 1952. *World Energy Supplies in Selected Years, 1929–1950*. New York, NY: United Nations.
- United Nations. 1997. *The United Nations Energy Statistics Database*. New York, NY: United Nations.
- US Energy Information Administration. 1999. *International Carbon Dioxide Emissions from the Consumption and Flaring of Fossil Fuels*. Washington, DC: US EIA.
- US General Accounting Office. 1999. *Renewable Energy: DOE's Funding and Markets for Wind Energy and Solar Cell Technologies*. Washington, DC: GAO.
- Vernon, Raymond. 1983. *Two Hungry Giants: The United States and Japan in the Quest for Oil and Ores*. Cambridge: Harvard University Press.
- Wallerstein, Immanuel. 1999. "Ecology and Capitalist Costs of Production: No Exit," pp. 3–11 in: Walter Goldfrank, David Goodman & Andrew Szasz (Eds.) *Ecology and the World-System*. Westport, CN: Greenwood Press.
- World Bank. 1999. *Fuel for Thought: Environmental Strategy for the Energy Sector*. Washington, DC: World Bank.
- World Energy Council. 1999. *Survey of Energy Resources 1998*. London: World Energy Council.
- World Energy Council. 2000. *Energy for Tomorrow's World*. London: World Energy Council.
- Worrell, Ernst, Rene Van Berkel, Zhou Fengqi, Christoph Menke, Roberto Schaeffer, & Robert Williams. 2001. "Technology Transfer of Energy Efficient Technologies in Industry: A Review of Trends and Policy Issues," *Energy Policy*, 29, pp. 29–43.
- Xu, Xiaojie. 2000. "China and the Middle East: Cross-Investment in the Energy Sector," *Middle East Policy*, vol VII(3), pp. 122–136.
- Yergin, Daniel. 1991. *The Prize: The Epic Quest for Oil, Money, and Power*. New York, NY: Simon and Schuster.

REVIEW ESSAY

Real World Globalization and Inequality Yesterday and Today: A Review Essay
Andre Gunder Frank

Globalization and History: The Evolution of a Nineteenth-Century Atlantic Economy.
By Kevin H. O'Rourke, Jeffrey G. Williamson. Cambridge, MA: The MIT Press. 328 pages, ISBN 0-262-65059-2, \$27.95 (paper). <http://mitpress.mit.edu/>

This book shows that the current “globalization” buzzword refers to a process that in fact already characterized the nineteenth century until the beginning of the First World War. From then and until the end of the Second World War, the process of globalization was severely reversed—in exemplification of one of the authors’ sub-theses that this process can and does have its own ups and downs and is not a one way ever-onward and—upward road, as latter day parlance would have it. During the half century past, the globalization process was re-initiated laboriously but haltingly until the last two and especially the last decade of the twentieth century, when globalism more than globalization recovered the reach it had already nearly a century earlier. Although this book focuses on the nineteenth century period, the authors nonetheless express important concerns for present and future praxis and policy. Not the least of them is the warning that “globalization” should not be regarded as an automatic and irreversible process; but that it must also be cultivated and protected, in particular from protectionism itself.

This wide-sweeping and far-reaching book represents a major piece, or set of pieces, in a still on-going assembly of a yet larger jigsaw puzzle, the outlines



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of which one of the authors has kindly provided me in the course of e-mail correspondence between us. As reviewer, I will here of course concentrate on the book. Nonetheless, I will try also to situate this book among the authors' growing concerns. These include debates of long standing among economists and historians to which the authors bring their own innovative sophisticated analysis of a rich database that in they have had to assemble themselves.

Their related works both tap into and further expand this database, which they thereby generously also make available to others as well, including those who may wish to use it also to contest their conclusions. I include myself among these, if only because in some of their work our authors take specific issue with my concerns and conclusions, which they dispute on the basis of their data and their analysis in this book and elsewhere. I therefore also permit myself to engage in what in a simple book review would normally be a no-no: to use the review of another author's book to push the reviewer's own agenda. I will do so below on pretext at least of writing a review *essay*, which not only engages a problematique that is wider than that of the book itself, but also one within which the authors themselves have already challenged my position by quotation and me by name.

The central question that the authors address is whether the Atlantic economy experienced convergence of income among its constituent parts. Their short answer is *yes*, in which some however receive more equal attention than others. Moreover, the rest of the world remains beyond their scope in this book, although not in their later work. The authors rely less on the usual per capita GNP or GDP and prefer to use the real PPP [purchasing power parity] wage rate of the majority of workers as an index of income, because it takes better account of the otherwise all too much and often disregarded important domestic distribution of income. So the second main question posed is to what extent and how openness and especially trade impact domestic distributions of income. This factor price wage rate of labor and its relation to the factor prices of land and capital are the empirical pieces and the analytical red thread that guides the authors' innovative and coherent assembly of this part of their larger puzzle still under construction.

Another part of the jigsaw puzzle the authors are assembling turns on their insistent and repeated question whether factor movements and trade substituted or complemented each other. The [neo]classical Heckscher-Ohlin Theorem had it that trade can be and is generated by equalizing factor prices and benefits from trade between two regions: A labor rich region exports labor intensive goods and imports capital and/or land intensive products from regions that are relatively rich in capital and land, thereby also tending to equalize factor prices between both regions. An additional question is whether such equalization also occurs *within* these regions, as per below. The authors' time series and other analyses

suggests that for most factors, products and times the trade of products instead complements the movement of the labor and capital factors that produce these products. That is, trade and capital flows, as well as trade and migration mostly rose and fell in tandem and re-enforced rather than replacing each other: increased capital flows and migration among regions also generated more trade among them.

Nonetheless, not only is trade found to be largely derivative from factor flows, but its contribution to wage/income convergence is much smaller than that of factor flows themselves. On the other hand, trade does have important consequences for the *distribution* of income. However, these effects are not the everywhere the same. They can result in both less and more equality of domestic economies, depending on differences in their pre-existing political economic structure. Usually, the effects are to accentuate both their already more equal and more unequal domestic distributions of income. Notably for instance, in the two Atlantic economies with the already previously most *un*-equal income distributions, that is Brazil and the United States, three decades of late twentieth century 'openness' *multiplied* this inequality. In a subsequent paper, the authors pose the question whether the Heckscher-Ohlin supposition that trade also affects the distribution of income is confirmed by the experience of England before the nineteenth century. They suggest that not, first because the nature of the goods traded could not have sufficient such effects, and second because trade did not, or was not sufficient to, equalize commodity factor prices among the trading regions.

This last observation becomes the index and key to a still later work that asks "When Did Globalization Begin?" They say that contrary to Frank and also to Bentley the answer is only since 1820–28, because only then did commodity factor price equalization or even convergence begin on a global scale. In an e-mail exchange, I objected and one of the authors O'Rourke agreed that equal factor prices across regions cannot serve as an adequate index of trade globalization; since even in the today's globalized economy world—and even national—factor prices and of course especially the wage price of labor—are still unequal. But if we agree that the presence or lack of price equalization *cannot* be used as an, let alone the, index of globalization, then what remains of our authors' argument that the absence even of convergence proves that there was no world economy?

Perhaps this is a glass-half-full/half-empty difference of appreciation. For if factor prices really *were equal*, there would be no incentive or reason to trade at all! In yet another and so far last paper in this series, the authors wonder why international trade grew rapidly from 1500 to 1800, even though they find no factor price convergence, which according to them only begins in the 1820s. In this regard, it may be observed that in fact tradable commodities like grains,

sugar, coffee, tea, silk etc. and goods, especially textiles, were already competitive substitutes from one end of the world to another during this earlier period (Frank 1998, Barendse 2002). That also tended to generate factor price convergence among them. Importantly furthermore, the worldwide trade of silver responded to different prices in different parts of the world. Thereby the trade of silver generated even more price convergence, not only for silver itself, but also for all the commodities and goods that were exchanged for and through silver. That is, and contrary to our authors' claims to the contrary, the already then globalized division of labor [that is, of production], trade and investment led to some convergence but *not* equality of factor prices, which had then become equal and would have stopped rather than increased international—really global—trade.

In this book however, the authors are not yet so interested in *when* factor prices converged and with what effect, than they are with *why* these prices—and in particular why real wage rates and income—converged in the Atlantic economies. Limiting the question to the circum-Atlantic is of course their privilege. However as I will argue at the end of this review essay, it is *not* adequate or satisfactory to answer questions of why what happened *in* the Atlantic Basin by drawing on evidence and its analysis, which is also limited only *to* the Atlantic. That is because in any one region factor prices are also formed through its participation in an already pre-existing and still continuing globalized world economy. Of course, and perhaps in part for that reason as the authors aver in their above cited works, part of our dispute is precisely whether a world economy did or did not exist before the nineteenth century.

For that period, the authors proceed with a sophisticated factor analysis of what did and did not have much influence on factor price equalization and on wage/income convergence among various countries for which there are statistics within the Atlantic region. They consider and reject education, demonstrate the importance of cost reducing innovations in transportation, and discuss tariff and other policies. They conclude that far and away the most important factor was mass migration, which in their estimation accounted for 70 percent of the convergence: Migrants reduced the labor/land and capital ratio and exerted upward pressure on wages in the labor exporting regions and increased the labor/land & capital ratio and exerted downward pressure on wages in the labor importing regions. Capital flows, although large and increasing especially in the last decade of the nineteenth and first decade of the twentieth century, contributed much less than migration of labor.

Accordingly, the authors allot three of their twelve chapters to migration and migration policies. Apart from the also important intra-European migration, especially into Eastern Europe—and also eastward within Russia—the authors re-examine the familiar overseas migration of 60 million Europeans and very

much less Asians. They also re-examine the familiar penury-push and riches-pull explanations for the sources, destinations, and timing of the migrant flows. More than elsewhere however, this book analyzes the underlying and resulting—that is changing—combinations of the availabilities and absolute and relative factor prices of labor, land, and capital.

Of course, the flows of these factors were related; since new capital investment, especially in infrastructure, was required to make labor and land productive in the regions of recent [European] settlement. [Although land and other natural resources of course remained in place, they may also be regarded functionally as flows inasmuch as they were incorporated into the economy through expansion of the frontier of—European!—settlement and resource use]. To render all of these profitable, they had to be bound together by international as well as internal trade and finance (e.g. railroads and canals).

The book also has several chapters on other aspects of political economic policy, both as an effect of/response to and as a cause of changing economic circumstances and events. Thus, there is a chapter on the movement to free[er!] trade at mid-century and the return to renewed protectionism during the last quarter of the century. The latter was a response to the “Great Depression” following 1873 and especially during the 1880s, although as it would again during the Depression of the 1930s, protectionism also re-enforced the very tendency that gave rise to it. In the earlier period however, such restrictions were imposed primarily on trade but not on factor mobility, while both trade and factor movements, again both of capital and of migration, were restricted during the second period. This difference can be attributed to or at least is correlated with more peace in the former and more war in the latter period, though it may be disputable which was more cause and which was more effect.

Another chapter examines the causes and consequences of capital flows, and the following one pursues the aforementioned issue of their substitution for or complementarity with commodity trade and migration. As per the book's title, the authors limit their empirical work and its analysis to only the circum-Atlantic regions; and they find that among these convergence did exist. However, some of these regions and convergence among them were more equal than others. Europe as a whole and the regions of recent European settlement are the beneficiaries both of more attention by the authors and of more convergence among them. Perhaps that correlation also has causative significance, although it is less clear in which direction the causes run.

The most important finding of the book and argument of the authors is that convergence among economies is a function and result of their degree of openness, also of trade but primarily to factor flows in response to underlying inter-regional differences in factor availability and relative prices. Among these

in turn, most important was the globalization of labor markets through migration and the expansion of the frontier. Indeed, the two should be regarded as largely functionally equivalent: Pushing the North America and Australasian as well as Argentinean and South African frontiers outward further globalized the labor market. The related migration obviously also served to extend the frontiers within these regions. Less often noted however, is that opening these regions and expanding their domestic frontiers through overseas out-migration from Europe also served functionally to extend the frontier of Europe itself.

Contrary to the Hecksher-Ohlin study, theorem, and predictions however and as already observed in general but also in a chapter especially devoted to thereto, the authors find that not commodity and manufacturing trade but rather factor mobility is the major contributor to wage rate and income convergence. The authors note on several occasions that received theory is rather ambiguous on a number of important policy related questions. But so is their work. To their credit, they want to speak to today's "debates" [p.3]. But how? They clearly demonstrate and stress that openness is correlated with, indeed causes [desirable?!] convergence, where the latter was observed: In much of the North Atlantic in the nineteenth century; and with the cessation of openness during the twentieth century war and inter-war period, so was convergence replaced by divergence. Ah, but not altogether, since parts of Latin America—also part of the Atlantic region—and certainly East and South Asia and significantly so the Soviet Union, experienced important measures of convergence. So how is it then that as the authors can state (p. 284) that "we believe that catching up of poor countries with rich may have as much to do with economic linkages as with any other force identified by growth theory.... Where there has been openness, there has been convergence: where there has been autarky, there has been either divergence or cessation of convergence." Ergo, the authors suggest that even still today it is important to resist temptations or forces to revert to controls and restrictions on movements of capital and migration that have sometimes been invoked during some periods in the past.

If that is the authors' conclusion and policy recommendation for the present and future, it is open to serious reservation on at least three counts, including some that they even raise themselves: [1] One is on their argument as it stands so far, [2] another is on how widely in the Atlantic economy convergence was *not* operative, and in the remainder of the world still less so, and [3] to what extent the authors' good cause and effect factor analysis is or is not adequate to account for observed, let alone unobserved, effects or consequences. We may inquire into the first two reservations here and then more extensively into the third one below.

[1] We must have very serious reservations about the authors' argument and policy conclusions already even on the analytic battlefield the authors selected

themselves and engaging them only with the analytic arms they use. Their insistence on openness for the future must be suspect insofar as it is based on their own factor analysis of factor movements and their consequences in the past. For the authors found that it was factor mobility of labor, primarily through inter-continental migration, that accounted for 70 percent of observed convergence. That also means that insofar as factor mobility was the crucial factor at all, the mobility of all other factors combined accounted for no more than 30 percent of observed convergence. Indeed, that percentage may also have been lower inasmuch as it is possible that some other factor mobility was *di*-vergent but compensated by labor mobility. Moreover, the authors find that merchandize trade did *not* generate convergence. That leaves capital mobility as the other most important factor. But regarding that, the authors find that capital moved as a complement of and not as a substitute for the movement of labor and the development of land and other resources. Without capital to make labor and land productive in the regions of recent settlement, their development and convergence would have been much less than it was or even nil. Moreover, it was precisely to these resource rich and labor-attracting, potentially productive regions that capital went elsewhere. So in the conclusion to their Chapter 12 on "International Capital Flows," the authors themselves observe that "late-nineteenth century world capital flows were a force for divergence, not convergence" [p. 245].

How much more so then must serious analysis of the evidence demonstrate, or even raw evidence or pure theory each taken separately suggest, that the enormous flows of speculative financial capital in the late-twentieth century had to be and have been highly *de*-stabilizing and *di*-vergent. Also still today, capital flows to the already or potentially productive regions, and not especially those with the lowest labor costs. So what does this *real world* historical experience even within the confines of the North Atlantic Region *really* teach us about factor mobility and especially capital mobility? Once openness to the global mobility of labor is closed off or even curtailed as it is today [except for the brain drain, which of course is *di*-vergent], openness to trade and to capital mobility no longer offer much of any source or generation of convergence! As the authors themselves note also still (on the same above cited page 284), "Thus, one must be cautious in applying lessons of history to the present, where mass migrations are so much more modest."

Why then would anyone wish to insist on openness [for everything except labor mobility!], unless it is for ideological reasons that mask *real world* interests, which are served by openness to capital mobility, and especially for speculative financial capital mobility, that far from accounting for convergence generates ever greater *di*-vergence.

[2] Contrary to the authors' rather wide-sweeping claims, convergence did

not operate everywhere and at all times of openness, and was even negative within Europe between its regions the North and the South of Europe, as the authors also observe. Moreover, as I observed above—and already in my 1966 article on “The Development of Underdevelopment”—relative autarky has also been associated with—and permitted?—national catch-up and thereby convergence in parts of the “Third” and “Second” worlds. However, the authors devote much less, indeed almost no, attention to what has come to be and be known as the “North” and the “South” in what also was and still is the Atlantic economy—and among them there was *no* convergence, but rather *de*-convergence and ever greater dispersion. Convergence certainly did not include the *Atlantic* economies of West and Southwest Africa or the Caribbean, nor even of west Atlantic South America—with one notable exception: Argentina and Uruguay during the period of the authors’ study, where at the end of which wages and income *exceeded* even the highest ones in Europe.

The sad decline—anything *but* convergence—of Argentina to the terrible crisis it now suffers as I write has of course been the object of unending studies. Whatever the reasons for this debacle, failure to follow our authors’ openness’ policies can *not* be said to be one of them. Even the short periods of partial economic isolation of Argentina were not due to endogenous policies but to loss of its export markets to agricultural protectionism elsewhere, by the Ottawa Commonwealth Agreement in the 1930s, the US Marshall Plan commodities exports to Europe, and then the US, Canadian, and West European Common Agricultural Policy throughout the past several decades. Ironically under these circumstances beyond Argentinean control, world and Argentinean economic policy since the 1976 military coup was to turn Argentinean “The Master Wheel” back to the pre-1930s wheat and meat export economy and to *de*-industrialize the intervening import substituting manufacturing sector, thus for the first time generating massive unemployment and declining income. Even so, Argentina in 1930 had accounted for 3 percent of all world exports; by 1990 already accounted for no more than 0.3 percent of them. The coup *de* grace to once proud Argentina was complete financial liberalization and the dollarization of its economy, which *de jure* incorporated and *de facto* marginalized Argentina and its by now miserably poor population.

In a word, for the also *Atlantic* regions in Latin America and Africa, openness was then in the nineteenth century and has been since in the twentieth century the road *not* to con-vergence, but to *di*-vergence. *That* must be taken as a second very significant limitation to the alleged benefits of openness and its recommendation by the authors even for the Atlantic economy, not to mention in the world economy. The same must be said also for Harold Innis’ and Mel Watkins’ related “staple” theory of growth. It holds that industrialization and convergence can be

achieved through production, early specialization and openness to the export of commodities derived from natural resources, including cattle and sheep ranching and grain farming. That was the experience in the Canada that served as their model, as well as in other land and resource abundant but labor scarce regions of recent European settlement. But it has equally assuredly *not* been the case in the labor abundant regions elsewhere in Latin America, the Caribbean and Africa, not to mention of Asia, which except in a few marginal references remain marginal and beyond the purview of this book as well. There is nothing wrong in not including this populous large part of the world in this book *per se*, all the more so as the authors increasingly do so in their above-mentioned related later work.

[3] Not so acceptable however, is the authors’ failure even to consider, much less to account for, the effects that this wider world political economy has on the Atlantic region and convergence among the northern [and non-convergence of the southern] parts thereof. For each and all of these regions is [only] part and parcel of this world economy as a whole. Nor do our authors seem to find much reason to study the complex [sub] system of trade, capital flow, and migration *relations* among the Atlantic regions and how these relations contribute to different degrees of convergence.

Instead this book focuses on and is largely limited to only inter-regional relative factor prices. However valuable their innovative study in this book unquestionably is, what this reviewer nonetheless finds missing is the examination of how *world* trade, capital movements and payments, and migration impact on the Atlantic Economy that is under study here.

All of these economic relations are and *must* be examined also as the structure and operation of the complex system of world trade and payments itself. For as the saying goes, the whole is more than the sum of its parts; and it and helps shape the parts and their relations among each other. Therefore, an adequate—or even any—analysis of *how* the causes and consequences of inter-regional [and inter-sector] flows of capital, trade and migrations and their consequences for convergence or not must also take due account of how any, e.g. Atlantic, regions were also importantly shaped by and dependent on what Ragnar Nurske called *The Network of World Trade* (League of Nations 1943). Moreover as he, Saul Condliffe and Frank (1978, 2001) analyzed and Kenwood & Lougheed apparently unsuccessfully sought to “popularize,” this network was and is characterized by a *world-wide multilateral* system of balances and imbalances of trade and payments. And arguably it is the *position within* this system, more than relative factor prices and productivity of each economic region and sector that determines their absolute and relative benefits and any convergence or not among them. Of course, if all positions were equivalent, occupying one or another would not afford any particular dis/advantage to whoever manages or is obliged to locate there.

But some positions are much more and others less beneficial than others, and even among apparently equal ones, some can in George Orwell's terminology be more equal than others. The importance of locational position in the world economy is by no means derived from or limited to only geographical location, as we will note below. But it is perhaps the easiest to visualize, e.g. in the locations over two millennia of Constantinople/Istanbul near one and Malacca/Singapore near the other end of Eurasia. The former boasted a population already of 750,000 while Paris and London were edging from 50,000 to 100,000. Both were located at natural turn-around places in Afro-Eurasian East-West and North-South trade. And what is the benefit they derived from their locations? *Monopoly Rent!* That is why I use the term *location, location, location* in the Nineteenth Century World Economy [Frank 2001] to dramatize this all too neglected problematique, also by our present authors.

Far from only [let alone perfect] competition making the system tick—that would equalize factor prices and converge incomes—it is competition to establish and hold on to *monopoly* positions from which to extract *rent* that is the real name of the game. That was an all too neglected observation already of Karl Marx, Joseph Schumpeter, Joseph Chamberlain and Joan Robinson—the latter under their titles of *imperfect* and *monopoly* competition—among economists and Fernand Braudel among economic historians. All of them alas claimed to be identifying and analyzing a structure and operation that is characteristic only or especially of “capitalism,” when the same has equally characterized political economy and the world throughout the ages. The patent illustration is the ever-present race to get patents and then by whatever ruse hold on to them and the monopoly rent that they afford, or to capture, construct, or be granted any other privileged position, not only geographical but also technological, productive, commercial, legal or just plain force/powerful in the local, national, regional and global political economy. Why else fund kings and conquerors throughout the ages, or lobby legislatures and contribute to political parties and candidates in “democracies”? Ask *Enron!*

This is not the place to elaborate thereon, other than briefly to note some of its possible consequences for our authors' analysis, conclusions, and policy recommendations. Hilgerdt and Saul analyzed and Frank (1978, 2001) further elaborated on this complex system of multilateral trade and payments imbalances in the late nineteenth and early twentieth centuries.

These may be simplified and schematically illustrated in two alternate or complementary ways. One is a set of triangles, beginning with that—or rather those—of the triangular Atlantic trade already before the nineteenth century. The second is the in/famous opium unbalanced trade and payments triangle among India, China, and Britain. Another is the complementary US, China and

Britain triangle of trade and payments imbalances. More and more triangles were added and interwoven as the nineteenth century progressed until these triangles merged into a more complex multilateral system of trade, its underlying division of labor, that is also of the expenditure of labor power here and there—and their consequences for the convergence or not of factor prices and incomes, which is the focal point of our authors' inquiry.

All these triangles had in common that their apex was in Britain, which thereby occupied the most privileged position in the world. Visually most obvious again is the geographic location and nexus that joined all the triangles in Britain. But this nexus of triangles also operationalizes and represents its position in the global productive and commercial system of multilateral trade and payments that Britain derived its maximum benefit *in monopoly rent*, arguably more than from its alleged workshop of the world productive prowess. For that was not sufficient even to avoid or remedy a structural Britain with merchandize trade *deficit* in every year of the century, which grew from 10 million to 160 million pound sterling from 1816 to 1913. How then, was Britain able to increase its consumption and income—and be the world's largest investor besides? Neither by its own efforts nor by taking advantage of factor price differences alone.

And how would convergence come about around the North Atlantic (and with Argentina and Australasia as well), while the rest of the world *de-converged*? Further to the factor prices so well analyzed in this book, this process can also be schematically illustrated in another way. Picture a world economic circle around the perimeter of which we locate the various world regions (however roughly or finely one wishes to cut them up) in locational correspondence to how each region is advantaged or disadvantaged by its triangular and then ever more multilateral relations with all the others. Then Britain was the top dog, which benefited first from its relations with Continental Europe, and both from their relations with the Regions of Recent settlement (and among these the United States with the British Dominions), and *all* of these from their economic and in some cases also political/military relations with the rest of the later so-called Third World, which instead of converging, *de-converged* and suffered “development of underdevelopment.”

Conversely, the location on the perimeter of the world economic circle permitted each of these regions also to benefit from its relations with those behind and below it, *and* to use part of the benefits it derived from others to export commodities and payments to the other regions to whose benefit it in turn contributed and who benefited from their location and relations with the regions behind and below it. As in the schematic illustration by triangles, in this circular world system of trade and payments im/balances, it was Britain who was top dog. Bye and bye it had to cede its place of privilege on the charmed circle to the United

States. At the bottom of the pile, stack or deck were and largely still remain the now underdeveloped Third World that made up the pedestal on top of and from which all the others literally made their fortune.

Within the now mis-called Third World however, there was one region—outside the Atlantic Economy!—that carried the brunt of these relations that were beneficial to others and disastrously *dis*-beneficial to itself: *India*. In effect, it was India and its direct relation to Britain that was the pedestal on which rested the structure and operation of the entire global system of multilateral Imbalances of trade and payments *and* of direct and portfolio investment and repayment. Each of B[ritain], E[urope], U[SA], and D[ominions] was able to settle all or part of its unfavorable balances with some by drawing on its favorable balance with others. That is, each of these regions was able “to settle its accounts” with the others by drawing on the productive inputs into the system as a whole of labor, land and other resource and capital in regions other than its own. Only the T[hird World] and within it particularly I[ndia]—except for the latter partly also with China—had no one else to benefit from and instead had to allow all other B, E, U, D regions to benefit from it [conversely, each of these regions was—and still is—able multilaterally to dissipate its own entropy to the others and lastly to T].

That is, not only were—and still are!—some able to profit and consume at home from the production of others abroad. The beneficiaries were—and ever more are—able to pass much of the other costs of their “American way of living” lifestyle at home off onto the backs of those who already produced the products for that life-style in the first place. No wonder that US Presidents Bush, father and son, have explicitly rejected sacrificing even a tiny bit of the American way of life just to keep from destroying the global environment elsewhere. Analogously, when President George W. Bush says that we can and will not let terrorists change our style of life, because if we did they would have achieved what they wanted to, the President means it—and backs his words up with military power and blackmail to preserve and extend the work that after the end of the Cold War his father began and called “The New World Order.” The question comes, what else is new?

I firmly believe that a responsible reviewer (responsible both to the author and to the readers) should review the book that *was* written and *not* a book that the reviewer may have liked to be, but was *not* written, and hence also *not* up for review. So why do I insist on even summarizing all this about the rest of the world, in a review of a book that is not about that? I do so for the simple reason that the economic processes of convergence and some factor price equalization within the Atlantic economy that the authors analyze so well, could *not* have taken place as it did and as they examine it in the absence of the relations

between the Atlantic Economy and its regional members and sectors with this remainder of the world.

The North Atlantic—but not most South Atlantic—regions benefited from their relations with other and especially Asian ones, but not only in some general way. The circum-Atlantic factor prices were directly related to those elsewhere in the world economy, as the same authors themselves show in their subsequent work thereon. So were therefore also the very factor movements and in particular the migration of labor within the Atlantic economy to which the authors attribute 70 percent of the convergence that they find there—but not elsewhere! But to make that labor and the new land it occupied productive and capable of generating commodities for export also required a complementary transfer of working and investment capital to provide the required infrastructure. But Britain was the principal exporter of capital all the while that its own exports were insufficient to pay even for its home consumption and investment, as also the United States today. Moreover, Britain then—and again also the US now—was unable to raise enough capital from its own savings at home to finance its investments. Its own productivity and savings were probably wanting even for its investment at home, and certainly altogether insufficient to cover its investment on the other side of the Atlantic and the world. What Britain then and the US now have been able to do however is in the name of “free” enterprise and trade of goods and services—to set up, run and manipulate a world embracing—more accurately choking!—financial system to their own monopoly advantage.

So where and how then did Britain raise this investable capital? True, some was derived from invisibles like interest and profits from previous investments and shipping and insurance fees. But that was all but sufficient for Britain to cover its structural merchandize import surplus. Moreover, to generate invisible earnings from its investments, Britain, Continental Europe and then also the United States had to place some foreign investment capital abroad in the first place. And the real source of most of that capital for British was its colony in *India*. Not only was India the linchpin or centerpiece of the arch of Britain’s—and through it the world’s and the Atlantic Economy’s—entire economic prowess in general. India was also the principal source in particular of the investment capital that Britain used to help construct and make tick the Atlantic Economy and the convergence among its northern regions.

All these regions to some extent and Britain very substantially therefore owed their growing prosperity and the convergence among them probably more to their position in the international division of labor and their ability to manipulate the world financial system in their favor than from their own labor or combination and use of productive factors in response to relative factor prices.

The same is again, or rather still, true today. The 1990s boom time in the United States, contrary to all the Clintonesque self-congratulatory backslapping, was in no way derived from any exceptional American productiveness or productivity, which the latter rose in electronics only, soon to bust there as in the economy as a whole. American consumption—despite the huge and ever growing trade deficit—and what little investment was largely derived from its *privileged position* in the world, which in turn rests on two main pillars: the dollar as the world reserve currency and the Pentagon as the keeper of the new world order. Each pillar also supports the other, and both have served American prosperity at the devastating cost of the vast majority of the population elsewhere in the world. During the 1990s, that was most spectacularly so in the former Soviet Union and Eastern Europe since 1990 and in parts of East Asia since the financial crisis of 1997, both of which were first generated and then deliberately deepened by US policy.

In conclusion, we must observe again that our authors' very laudable but sole (or main) object of inquiry has been factor price equalization and income convergence among otherwise separate productive, sectoral and geographic units. We already observed earlier on that [1] even their own evidence does not support their argument for openness even on their own turf and that [2] the evidence they do not examine beyond their own turf disconfirms their argument altogether. [3] Thirdly and most importantly however, their factor analysis of what factors and factor prices intervene in the process of con- or di-vergence are not the only factors of major significance for the economic and social outcomes that the authors are keen to observe and explain. The structure, organization, functioning, and transformation of the global world economy itself and the location within it of any particular unit also accounts for as much or very probably more, as per the titles of Adam Smith and David Landes, of "the wealth and poverty of nations," their inhabitants and of con- or di-vergence of income among them. By confining their analysis almost entirely to the former in neglect of the latter, our authors therefore also able to convey at best only half or even less of the truth. I leave it to the reader to judge whether a half-truth or less is better or worse than none.

REFERENCES

- Barendse, Rene. 2002. *Arabian Seas*. New York: M.E.Sharpe Forthcoming.
- Condliffe, J.B. 1956. *The Commerce of Nations*. New York: Norton.
- Frank, Andre Gunder. 1966. "The Development of Underdevelopment." *Monthly Review*.
- Frank, Andre Gunder. 1978. *Dependent Accumulation and Underdevelopment*. New York: Monthly Review Press and London: Macmillan Press.
- Frank, Andre Gunder. 1998. *ReORIENT*. Berkeley: University of California Press.
- Frank, Andre Gunder. 2001. "Location, Location, Location to Dissipate Entropy In The Nineteenth Century World Economy." Paper presented at International Studies Association, Chicago Annual Meetings, Feb. 20–24, 2001.
- Hilgerdt, Folke, for League of Nations. 1942. *The Network of World Trade*. Geneva: League of Nations.
- A.G. Kenwood and A.L. Lougheed. 1999. *The Growth of the International Economy 1820–2000*. New York: Routledge.
- O'Rourke, Kevin H. & Jeffrey G. Williamson. 1999. "The Heckscher-Ohlin Model Between 1400 and 2000: When It Explained Factor Price Convergence, When It Did Not, and Why." Cambridge: National Bureau for Economic Research NBER Paper #7411: Forthcoming in R. Findlay, L. Jonung and M. Lundahl (eds.), *Bertil Ohlin: A Centennial Celebration 1899–1999* (MIT Press).
- O'Rourke, Kevin H. & Jeffrey G. Williamson. 2000. "When did Globalization Begin?" Cambridge MA: National Bureau of Economic Research, Working Paper 7632, www.nber.org/papers/w7632. Forthcoming, *European Review of Economic History*.
- O'Rourke, Kevin H. & Jeffrey G. Williamson. 2001. "After Columbus: Explaining the Global Trade Boom 1500–1800." Cambridge MA: National Bureau for Economic Research NBER Paper #8186.