Economics as Ideological Fantasy: Dispensability of Man by Way of Changing the Nature of Ideas

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> As the archaeology of our thought easily shows, man is an invention of recent date. And one perhaps nearing its end. If those arrangements were to disappear as they appeared, if some event of which we can at the moment do no more than sense the possibility . . . were to cause them to crumble, as the ground of classical thought did . . . then one can certainly wager that man would be erased, like a face drawn in sand at the edge of the sea. (Foucault, 1973, p. 387)
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> The simple notion of the everyday world as problematic is that social relations external to it are present in its organization. (Smith, 1987, p. 94)

Abstract: *From the question of usury to the reorganization of relationships to the land and our neighbors, individuals have sought to privatize the temporal, material, and spatial as property for gain. Today, capitalism and its proponents face their ultimate challenge: the immediate and efficient privatization of knowledge, setting as their ultimate goal the dispensability of "man." Knowledge in a global context is perceived and promoted as central to nation-state competitiveness. Its production and consumption are precisely manipulated and regulated. As such, knowledge workers have become increasingly central to economic and political reorganization, evidenced by the university's increasing integration into the private sector, both from a fiscal and a social perspective. This phenomenon, often referred to as the "corporatization of higher education," aggressively and effectively rearticulates knowledge as intellectual property, institutionalizing and facilitating its eventual enclosure. To this end, knowledge increasingly exhibits properties of a private good while maintaining the ideological fantasy as that of a public good operating in the "free market." In reformulating economic theory in general and its*

constituents in particular, capital captures any social surplus while simultaneously shifting the cost of negative externalities to the public domain. These externalities include the eradication of a global intellectual commons. This paper addresses capital's overarching need to regulate the activities of knowledge workers and the mechanisms through which this is accomplished, which include the reformulation of economic theory vis-à-vis the personification of its constitutive elements.

The Notion of "Private" Property

The private right to property coalesces power, prestige, and privilege in the hands of fewer and fewer individuals. Private property, in its specific incarnations, has become an expression of control and regulation, and opposition to its expansion is viewed as economically illiterate. Throughout history, individuals have consistently sought to privatize the temporal, material, and spatial as property for gain. The temporal realm is best exemplified in the case of usury. Today its display has broadened to include a wide range of prediction technologies[1] and cosmetic enhancements.[2] The material realm encompasses our relationship to the earth, its soil, its resources, and its potentialities. The spatial realm refers to our physical proximity to our neighbor, quantified in terms of population density and its necessary corollary, displacement. Simply put, each successive stage of privatization has had as its effect the reorientation and simultaneous naturalization of our relationship to time, to the land, and to one another.

The question of usury, which, Rifkin (1998) argues, delineates the commencement of privatization in the temporal realm, dates from fifteenth-century Europe and is grounded in debates between the Catholic Church and an emerging merchant and banking class. The church's argument contained two central themes. The first was premised on the lack of ownership rights to "time" asserted by the rising bourgeois class. The second, which has resurfaced during historical periods of economic "crisis," concerned the notion of "moral economics"; that is, empowering the buyer to set a "just price" that reflects "fair exchange value." Rifkin (1998) suggests that the church's loss represents the beginning of a slippery slope (i.e., the continual encroachment and exponential privatization of property vis-à-vis monetary mechanisms). Perhaps this event more aptly foreshadows the enclosure of the "commons of the mind," coincidentally also classically viewed as intangible and until quite recently, protected within the public domain.

The transformation of the material world can be traced to Tudor England in the sixteenth century with the enactment of the great "enclosure acts," which began the commodification of the global commons.[3] As a re-

[1] Such as medical diagnostic and insurance/assurance technologies.

[2] Such as pharmaceuticals, pharmacogenetics, and surgeries. As opposed to the charging of interest for time, this category foresees time, masks its appearance, recaptures it, or makes it stand still.

[3] Referring to an indigenous treatment of land, this term implies that the land belongs to no one being but is to be shared and experienced harmoniously.

sult, the balance between each individual's servility to the land and interdependent alliance and reliance on others fundamentally changed. As Rifkin (1998) states,

> Land was no longer something people belonged to, but rather a commodity people possessed.....Virtually everyone and everything became negotiable and could be purchased at an appropriate price. (pp. 39-41)

Once again, though the argument during this period for strong property rights stemmed from economic arguments (i.e., overuse and underinvestment), our current expansion of property rights is reflective of these circumstances: (1) Historically uncommodifiable things are being transposed into private property and (2) commonsense logic regarding unregulated production is seen as inefficient.

These changes in our relation to the material world have also affected our relationship to each other in the spatial world. As an example, the coming of the industrial age and the concurrent rise of capitalism ushered further "progress" in each individual's relationship to the land; namely, his or her removal from it as evidenced by the physical centralization of people in urban centers. As Noble (1977, 2000) suggests, through Fordism[4] the worker's technical knowledge was, and continues to be, appropriated, a phenomenon that spawned the growth and development of modern management.

Whereas the aforementioned examples more clearly delineate the effects of privatization in one realm, thereby casting residual effects in the corresponding others, current affairs are increasingly interconnected. As a case in point, "urban planning," with innumerable discourses of lifestyle choices, exemplifies the continual change occurring within familial[5] relationships as well as relationships to work, leisure, and to the land.[6] In the Third World, the "Green Revolution," "scientific forestry," and the proliferation of genetically modified food technologies provide an additional account of this transformation. Shiva (1993b) addresses these issues by exploring a notion she labels as the creation of negative pluralities: "diverse communities … Positive pluralities give way to negative dualities… nothing is sacred, but everything has a price" (pp. 4-5). Moreover, she argues that these differences, instead of leading to a richness of diversity, will become an "ideology of separatism." This ideology was foreshadowed by Marx (1970) when he spoke of the right of private property that "leads every man to see in other men not the realization, but rather the limitation of his own liberty" (p. 25).

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[4] Fordism commonly refers to industrialism after World War I. It is generally characterized by systems of mass production, automation, and an expanding domestic market, which requires increasing consumer consumption.

[5] I do not mean to imply that the nuclear family, as defined by Canadian immigration law, is the correct or only definition; for instance, see Ng (1997) for a critique of the construct.

[6] Examples include homes as multipurpose spaces, health clubs in the office environment, and homes that address individual or family lifestyle choices.

The opaqueness of these rearticulations shows a clear tendency within our society toward the eventual "separation" of "man" from his ideas.

Once Upon a Time...The Roots of an Economic Fantasy

The history of private property, its expansion and rearticulation, is increasingly relevant in a postindustrial economy in which the media of science and technology are rapidly affecting the change and pace of human interaction and, in the process, redefining economic theory. Presently, capitalism and its proponents face an almost insurmountable challenge: the immediate and efficient privatization of knowledge. Acknowledging that the ability to produce knowledge is intrinsic to a human's corporeal being, capitalism (i.e., the system) and capital (i.e., its Trojan essence) have skillfully maintained the involvement and commitment of intellectual labor throughout the knowledge production process through discursive technologies such as the practice of scientific management. However, once produced and physically severed from the body, knowledge poses a further challenge to capital: its "leakiness" makes it difficult to trap and stake as property (Newson & Polster, 1998, p. 181).

Theoretically, knowledge is defined as a public good.[7] As such, it exhibits nonrivalry and nonexclusion; furthermore, it should be provided free of charge, whether exclusion is possible or not. Nonrivalry implies that one individual's consumption of a unit of the good does not obstruct another individual's consumption of that same unit. Nonexclusion implies that individuals not paying for an item cannot be excluded from consuming it. Privatization of the sites and mechanisms involved in knowledge production, as well as the rearticulation of knowledge as intellectual property, is vital to knowledge's reconceptualization as a private good. This reconceptualization not only allows capital to capture the social surplus generated through its production but also shifts the cost of any negative externalities[8] to the public sector. Examples of these processes and the mechanisms constructed are examined in the following sections.

Knowledge as "Intellectual Property"

The rearticulation of knowledge as intellectual property and the manipulation and regulation of its production and consumption are illustrated by the proliferation of the intellectual property rights business. Globally, this development is driven and facilitated by the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of the World Trade Organization (WTO) and the Uruguay Round of the General Agreement on Tariffs and

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[7] Competitive markets will not produce public goods (e.g., streetlights), and therefore governments provide them, financing the cost through taxation.

[8] Since competitive markets accommodate only private costs and private benefits, competitive equilibria will not be efficient in the presence of externalities, which may be positive or negative.

Trade (GATT); the World Intellectual Property Organization (WIPO);[9] and legislative patent reform in Europe and the United States. Within these mechanisms, knowledge is captured, centralized, and controlled.

The WTO entered into an agreement with WIPO to provide for cooperation concerning the implementation of the TRIPS agreement, such as notification of laws and regulations and legal-technical assistance and technical cooperation to assist developing countries. In July 1998 a joint initiative to help these countries meet their TRIPS obligations by the year 2000 was launched. These activities are designed to provide, among other things, advice and expertise in the revision of national legislation, extensive computerization assistance, and financial support to participate in WIPO activities and meetings. Most disturbing, however, are the initiatives that propose education and training programs at national and regional levels in these countries. Designed specifically to teach and reinforce the notion of the intellectual property, these programs demonstrate "how to create their own economic assets through better use of the intellectual property system" (WIPO, 2000).

On a microlevel, the exponential increase in the assignment of intellectual property rights is corroborated by the significant rise in two fields of particular interest: biotechnology and medicines. From 1980 to 1999, the number of patent categories in biotechnology rose from 297 to 718; in medicines, it rose from 839 to 1,966. Furthermore, the number of single international patents rose from 2,600 in 1979 to 74,000 in 1999 (WIPO, 2000). This figure, though startling, is deceptive given that the majority of patents are held in a specific country and therefore are not captured in this international statistic. Examination on a macrolevel exposes other factors, which illuminate the growth of the intellectual property "business" within WIPO and with its members and partners. From its meager beginnings in 1883, the organization now maintains a worldwide staff of 760 people and a biannual budget of 410 million Swiss francs (WIPO, 2000). However, because about 85 percent of the organization's budget comes from the earnings of its three major registration systems,[10] it is clear that WIPO has a vested interest in the proliferation of property rights.

Patent Protection

The notion of intellectual property is legally grounded in patent legislation. To qualify, an invention must be of practical use, demonstrate novelty, and show an inventive step; in addition, the subject matter must be accept-

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[9] WIPO is a specialized agency of the United Nations (UN), which boasts 175 nations as member states as well as several nongovernmental organizations (NGOs). WIPO is dedicated to "the use and protection of works of the human spirit" by "providing a stable environment for marketing of intellectual property products" (World Intellectual Property Organization, 2000). WIPO administers 21 treaties on intellectual property, including 15 on industrial property and 6 on copyright.

[10] Digital Agenda, WIPOnet, and the Information Management for the Patent Cooperation Treaty (IMPACT).

able as "patentable" under law. The basic argument for patent protection relies on the age-old premise that if individuals or corporations (who currently have many "individual rights and freedoms") are to risk financial resources to develop and bring new and useful products to the market, it is essential that they be protected. Patents are necessary because they provide incentives, recognition, and material reward and "encourage innovation, which assures that the quality of human life is continuously enhanced" (WIPO, 2000). In fact, WIPO's basic assumption is that each and every country "needs a well-developed and healthy intellectual property system for economic and social well-being" (WIPO, 2000). Issues such as governance and conflict of interest appear self-evident; however, these themes are not addressed or referenced in WIPO's literature. Possible concerns include but are not limited to the following: By or against whose standards should the quality of human life be assessed? Why is the focus solely on the quality of "human" life as opposed to that of the ecosystem or nonhuman organisms? Is innovation a necessary condition to ensuring that this process is continually enhanced? A further irony with harmful implications lies in the creation of demand for "innovative" products not only through consumerism but also through the destruction of alternatives.

The discursive practice of patenting illustrates multiple streams of reductionist thought at work, all of which support an asymmetric economic order between the countries of the north and those of the south.[11] Shiva (1993b) articulates the first stream of such thought by recognizing that "[p]eople everywhere innovate and create. In fact, the poorest have to be most innovative, since they have to create survival while it is daily threatened." Patent laws reward individual innovative efforts, whereas collective efforts, representative of communal or indigenous knowledge, are treated as "prior art" and are altogether dismissed. In other words, any noncommercial investment of time and social concern is viewed as a noninvestment. This is readily demonstrated with examples of trends in the biotechnology industry and its "raping" of indigenous knowledge. As Shiva (1993b) puts it, instruments such as GATT, the Biodiversity Convention, and the US Trade Act are

> being used to universalize the US patent regime worldwide. . . [displacing] other ways of knowing, other objectives for knowledge creation and other modes of knowledge sharing. . .a purposeful movement toward the privatization of the intellectual commons so that the mind becomes a corporate monopoly.

[11] As opposed to an asymmetric economic argument, there is much critique regarding an asymmetric information flow. Conversations address the negative costs and consequences such as: reverse brain drain (the movement of intellectual/human capital from the Third to the First World); academic imperialism (the creation of links between First and Third World countries whereby the returning educated elite bring Western/Eurocentric knowledge, ways of doing business and links to First World individuals/institutions that impede communication/cooperation within/among lesser-developed nations); arguments that suggest a general trend to disguise the costs and overinflate the benefits of "aid" and "development" (Mazrui, 1978; Selvaratnam, 1985).

The second stream of reductionist thinking involves rearticulating human beings as the physical site of intellectual property. Rifkin (1998) asserts that "genes are the 'green gold' of the biotech century . . . [and that] the shrinking gene pool is going to become a source of increasing monetary value" (p. 36). Whereas those who pillaged ancient ruins were prosecuted within national boundaries, "gene-hunters" operate in a global landscape where local communities are legally impotent to manage their activities (Rifkin, 1998, p. 36). Transnational corporations persistently "progress" toward finding the cause of diseases and then making both the cause and the cure private property, skillfully creating an economic environment that lacks "substitutes" not only in the goods but in the sites of knowledge production. Shiva's concern about the encroachment on indigenous knowledge is extended here to include the seizure of the Third World biological commons. In fact, the unproblematic tone with which this faction asserts its property rights is illustrated by William A Haseltine (2000, pp. 1-2), chairman and chief executive officer of Human Genome Sciences:

> Apparently, *some people mistake patents as ownership rights* and see genes only in their broadest possible context as instruments of heredity. A patent is a social contract between society and an inventor, originally developed by the Venetians to promote trade and commerce and avoid accumulation of trade secrets . . . The most common public misunderstanding seems to be that patents convey ownership, *rather than temporary commercial benefits to inventors. Many laymen also seem to regard genes as an almost spiritual collective essence of humanity and therefore not appropriately subject to commerce.* Rather, . . . 'genes,' as we in genomics understand them, are . . . individual genes removed from the natural context of the human body and rendered useful by crafting them in specific ways for medical use. *These genes are artifacts made by the hand of man, and as such, they are subject to patents.* (italics added)

This statement lies in direct contrast to practices in disciplines such as archaeology but bears strong resemblance to the argument used by the merchant class over the question of usury.

There are extraordinary implications of privatizing the human body, not to mention the practice of parceling it out in the form of intellectual property to commercial institutions. One example of this involved a precedent-setting case in California between an Alaskan businessman and the University of California at Los Angeles (UCLA). Without his knowledge or consent, his body parts were patented and licensed to the Sandoz Pharmaceutical Corporation (Rifkin, 1998, pp. 60-61). The university then created a cell line from the spleen tissue and obtained a patent on their "invention" in 1984, valued at US$3 billion. After the man sued the university for the property rights to his tissue, the California Supreme Court ruled against the individual, holding that he had no such right. Apparently, his naturalistic property claims were an impediment to innovation. However, the Court, while upholding UCLA's property claim, also ruled that the university had a fiduciary responsibility to inform him of the commercial potential of his tis-

sue and was liable for monetary damages. This example is of particular interest, because it clearly defines the circuitous nature of "rational" thinking regarding notions of private property, from the concept of usury to yet another paradoxical situation whereby corporate entities (endowed with individual rights) have ownership privileges to the human body. However, an individual's corps is not considered self-patentable. Rifkin (1998) cites many other examples that clearly illustrate not only the scope of implications but also the unethical nature and stream of thinking on intellectual property. What he suggests is quite alarming but simplistic: industries identified a major problem for international trade, crafted a solution, reduced it to a concrete proposal, and sold it to governments through implements such as the WTO and GATT. This example provides a convenient starting point for discussion of the university as a site of intellectual property transfer, beginning with an exploration of the institution in the larger economy and followed by an examination of academic work from within.

The Neoliberal Agenda

Dearlove (1997) points out that from a "Marxist political economy perspective, . . . in order to understand what is happening to the organization of academic work inside universities it is important to situate universities outside of themselves, in the larger context of the capitalist economy" (p. 61). Although the individual circumstances surrounding the evolution of private property and the discourse of knowledge as intellectual property in the aforementioned discussion appear benign, taken collectively, these processes are fundamentally aligned with the neoliberal agenda, as exemplified by Reaganism and Thatcherism, and its project: the global naturalization of capitalism. Generally speaking, this agenda advances the notion of democracy vis-à-vis the major discursive features of capitalist social organization: private property; the "free market"; meritocracy; and the safeguarding of "individual freedoms" (Teeple, 2000). It heralds the dismantling of the welfare state, the logic of privatization and free trade, and with these, the commercialization and wedding of higher education to the machinery of capital. Given this strong assertion, it would be prudent to question whether there has been a qualitative or quantitative shift in the relationship between higher education and capital in the last two decades. First, a brief overview of the twentieth century would be helpful in elucidating any macroscopic transitions and/or transformations.

Historically, while the German model of the university gained legitimacy through its research function, the "Western model" through its notion of "liberal education" gained its legitimacy through service to the nation (Brubacher, 1977). Barrow's (1990) examination of governance structures in US higher education institutions reveals a healthy representation of corporate interests on boards, in roles as trustees, and in positions of influence from the beginning of the twentieth century. As well, Noble (1977), in a detailed examination of engineering education in twentieth-century America, demonstrates links between the needs of capital, the demands of a growing nation-state, and the construction of an educational apparatus de-

signed and tooled for the efficient production of human and intellectual capital. The systematic shaping of engineering education in this case created a specific relationship whereby corporations could participate in and dictate the progress of modern technology and ensure the stability and growth of corporate capitalism. Examples include cooperative programs in the public school and postsecondary system, designed to develop not only a responsiveness to the demands of industry but also an alignment of the right types of individuals into the correct avenues of engineering. At the same time, the responsibilities for personnel training and basic research shifted from corporate sites into the university, pushing toward the complete assumption of industrial responsibilities by systems of higher education. These two examples, framed within a post-World War I climate in which the US government not only seized German patents but also intensified reform of patent legislation, benefitting those with political connections or in control of or access to capital, provide clear illustrations that the link between the university and capital, aided by government intervention and regulation, is a centuries-old phenomenon. Interestingly enough, with respect to the Canadian landscape, scientific cooperation between industry and the academy declined significantly in Canada after 1965. A shift from corporation funding to government funding of research occurred after World War II, although industry still provided a significant portion to campus-based research budgets.[12]

Capitalism in Crisis

Although the university retains much of its medieval form, theoretically residing in the public domain, it is being increasingly integrated into the private sector, from both a social and a fiscal perspective, underpinned by two decades of neoliberal politics. In fact, "the link between the University and the nation-state no longer holds in an era of globalization. The University thus shifts from being an ideological apparatus of the nation-state to being a relatively independent bureaucratic system," susceptible to the designs and influence of capital (Readings, 1996, p. 14). While corporate involvement is by no means a new phenomenon, "academic capitalism" or the corporatization of higher education, as it is fashionably referred to, has changed in spirit and essence. Although the university's role continues to be that of the intellectual arm of a "new ruling class," its ideological power, or manner by which certain "established" peoples exert a controlling influence on the intellectual labor process, is inextricably linked to the private sector and the demands of capital (Brubacher, 1977; Smith, 1987).

The crisis tendencies of capitalism, such as the global overaccumulation of commodities, have contributed to increased proprietary control and institutional regulation of apparatuses of knowledge production. Now

[12] See Tudiver (1999, p. x) for a discussion on the Science Council of Canada's "call to intellectual arms" and the promotion of the service university during the mid-1980s, which implored universities to transfer their knowledge and findings to industry.

more than ever, knowledge development and skilled workers are seen as a competitive advantage, providing the necessary technological and human capital to compete in increasingly international economies. The university is exponentially transformed into a source of productive capital for industry and an institution that not only tolerates but also vehemently advocates ideological support for capitalist relations. Given that knowledge workers have become increasingly pivotal to economic and political reorganization, economic and political measures are being brought to bear on the way their activities are to be regulated and the way information is controlled. Leftist critics have proposed a number of rationales for this: (1) the increase in their numbers relative to other categories of workers; (2) the increasing mobility of international labor pools of knowledge workers (reverse flow of technology and human capital from the Third and Fourth Worlds); (3) the Fordist relationship with universities and industry, whereby the university needs to be regulated like an industry; and (4) their perceived importance in achieving industrial and national competitiveness in the context of globalization (Newson & Polster, 1998, p. 181).

The Transition Game: Facilitating Technology Transfer

Fiscal integration of higher education into the private sector can be clearly demonstrated by several factors, one of which is intellectual property. Although

> the traditional university produces knowledge through research, and distributes it freely in the public domain through teaching, publication, and community service, . . .intellectual property changes the incentive system. . . .Profit derived from intellectual property is the cornerstone of the corporate university. (Tudiver, 1999, pp. 155-59)

In fact, research of particular professors or campus-based capital initiatives may be financed in return for industry's preferred rights to exploit these discoveries. Universities, through spin-off companies and foundations, also find it lucrative to help researchers commercialize inventions in return for capital or investments, strengthening academic research and offsetting falling government funding (Bok, 1982).

As a case in point, the University of Toronto participates in this practice through several mechanisms; the two of importance here are a technology transfer office and a policy on inventions. Its inventions policy, created by the Office of the Vice-President, Research and approved by the Governing Council of the University of Toronto on May 3, 1990, has three basic objectives: to "encourage the creation of Inventions, facilitate the commercialization of these Inventions, and to ensure that the proceeds from commercialization of these Inventions are distributed in a manner consistent with the first two objectives and the advancement of research at the University" (University of Toronto, 1990). Essentially, inventors have the option of pursuing commercialization independently, with a 25 percent kickback of net revenues to the university, or they can assign their rights to the Innovations Foundation,

thereby taking a smaller percentage of the take. The Foundation is a university entity designed to commercialize intellectual property; in fact, the number of active spin-off companies at the University of Toronto rose from 74 in 1996-97 to 89 in 1998-99, even with declining invention disclosures (105 to 91) (University of Toronto, 2002). "By 1997-98 Canadian university researchers had created 312 spin-off firms to develop and market their inventions, with equity in 42 of the firms for a total of $17 million" (Statistics Canada 1998, as cited in Tudiver, 1999, p. 158).

In addition to in-house practices, the Canadian federal and provincial governments[13] now act as matchmakers to marry business and university interests in seamless research enterprise.[14] One particularly powerful example of this trend has been the creation of matching grants whereby funds secured from the private sector by a postsecondary institution will be "matched" by government dollars. This behavior is a direct result of neoliberal politics: the forceful and purposeful integration of the knowledge production function into the private sector and the whims of the "free market." This is evidenced by Industry Canada, Centres of Excellence, Natural Sciences and Engineering Research Council (NSERC) University/Industry Programs, Medical Research Council of Canada (MRC) University/Industry Programs, and Social Sciences and Humanities Research Council (SSHRC) University/Industry Programs.[15] As a case in point, the Industrial Research Assistance Program is a service, which facilitates industry in sourcing postsecondary environments for specific academic expertise. Continued re-

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[13] The National Research Council (NRC) is Canada's premier science and technology research organization and a leader in scientific and technical research, the diffusion of technology, and the dissemination of scientific and technical information. The Canadian Technology Network provides assistance on technology and related business issues. The Industrial Research Assistance Program (IRAP) is a nationwide network of more than 260 Industrial Technical Advisors, scientists and engineers chosen for their expertise and business experience. The National Expertise Index (NEI) contains listings of more than 13,500 researchers and their areas of expertise from public research centers. The National Technology Index (NTI) is a listing of more than 1,200 licensable technologies from the public sector. Opportunity Match is a companion service to NTI that alerts you when new technologies that match your profile are entered in the index. The National Graduate Register, maintained by Industry Canada, is a data bank that companies can use to link up with top students in science and engineering. The Industrial Research Chairs program sets up a distinguished researcher and research team in an area of importance to industry; NSERC shares the salary and the costs of key researchers. The Collaborative Research and Development (CRD) Grants Program partners business with a university and shares the costs.

[14] Two white papers released by the federal government in February 2002 address Canada's innovation performance: "Achieving Excellence: Investing in People, Knowledge, and Opportunity" and "Knowledge Matters: Skills and Learning for Canadians." See Canadian Association of University Teachers (2002) for critique.

[15] Government funding leveraged by industrial collaboration: Network of Centres of Excellence (April 1997-March 1998), $4.7 million and Ontario Centres of Excellence (April 1998-March 1999), $8.3 million. Government funding leveraged in 1998-1999 by industrial collaboration for NSERC University/Industry programs was $4 million; for MRC University/Industry Programs, it was $1.3 million.

shaping of government funding mechanisms in higher education is aligned with in-house discourses that speak of partnership building and technology transfer. Some argue that these initiatives do little more than subsidize private companies for contributions they were already prepared to make (Cameron, 1991, as cited in Tudiver, 1999). In addition to grants, NSERC provides foolproof tools such as search engines, indices, and registers to facilitate potential partnerships in the exploitation and commercializability of intellectual property (NSERC, 2000). NSERC also ensures that Canadian industries can compete in an increasingly global economy by jointly funding collaborative research and development projects with scientists and engineers in universities across Canada:

> Our share-cost programs are flexible and responsive, and they make business sense. . . . They . . . stretch your research dollar; link you with skilled and knowledgeable people; deliver creative ideas and practical solutions; promote long-term partnerships; and provide access to specialized facilities and equipment. (NSERC, 2000)

Another example of NSERC's mechanisms is the Technology Commercialization Toolbox, a resource guide and primer for individual inventors and companies who wish to turn their ideas into marketable products (NSERC, 2000). The guide's *Top Ten Tips for Inventors* is laden with mixed messages:[16]

> This may substantially increase the risks of failure due to a lack of the appropriate management skills and experience on the part of the technically trained developers and the difficulty in attracting capable executives due to their relegation to subordinate roles.[17] (NSERC, 2000)

How does this play out at the University of Toronto? Through its Inventions Policy (University of Toronto, 1990) and practices emerging from the Technology Transfer Office, support is readily given to faculty who choose to commercialize independently. However, the initial trend whereby approximately 90 percent of the faculty embarked on this process independently is now changing. The costs and risks of the patenting process, the inventor's suitability to business, and the opportunity cost of time spent away from research are all reasons for the shift back to assigning ownership to the university's Innovations Foundation. It is interesting to note the

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[16] The following are paraphrased highlights of selected tips: "creating a new firm to commercialize the technology is a major undertaking, and may result in an organization that is not up to the task; . . . the ability to exploit the technology within the critical time frame; . . . recognize that inventors are often not suited to commercialize" (NSERC, 2000). On the one hand, the guide serves as a flowchart to successful commercialization; on the other hand, it warns inventors (and in the process, investors, who need no warning), who are often not suited to commercialize, of the pitfalls, especially if they wish to play a central role in the management of the technology commercialization process.

[17] See also University of Toronto technology transfer newsletters and media for similar discussions (University of Toronto, 2002).

parallel to patent legislation and reform in the United States at the turn of the twentieth century as discussed by Noble (1977). Lack of business acumen, access to sufficient venture capital, and patent games drove the "small man" out of the invention game.

However, the tide is certainly beginning to turn where academic staff associations are concerned. For example, the Canadian Association of University Teachers (CAUT), although at first supporting closer ties with industry, was by 1999 openly criticizing the corporatization of higher education. Since then, the CAUT has become more aggressive in its commentary. Believing that intellectual property is a central issue of public policy, the organization has established commissions, convened expert panels, lobbied government, and published several reports on the viability and effectiveness of government and institutional strategies that increasingly wed research to the marketplace (CAUT, 2001-2002).

Higher Education Institutions as Corporate Entities

Operating universities like businesses changes their essence (Axelrod, 1982; Cameron, 1991). Accountability defines relevance, excellence molds discourse, and decision making is shaped by measures of financial viability. Profit becomes the guiding principle for deciding which services and products to offer, given that business is not interested in supporting its critics or the counter-hegemonic spaces they occupy, such as the social sciences. Teaching has become a marketable commodity. Research is laden with expectations of quantifiable and economically worthwhile results. As Rowat states, "the key to developing corporate-friendly practices lies in managing a university like a business, (which) is inherently hostile to the purposes of the university" (as cited in Tudiver, 1999, p. 169).

At this point, a brief overview of the economic objectives of a corporation is beneficial. Corporations are concerned with controlling costs, ideally increasing the ratio of variable to fixed overhead. This lends flexibility and responsiveness in cost control and decision making. As wages make up a significant portion of the overhead cost, any entity desires the cheapest labor with the flexibility to change labor needs dependent on funding, projects, and the needs of the marketplace. Labor becomes a commodity of capital, and training begins to focus on producing flexible, interchangeable workers. Direct intervention on the part of industry creates industry-specific labor pools to be deployed in support of its short-term needs. This process produces a commodification of workers (Smith & Smith, 1990). What is more, corporations have a responsibility and responsiveness to shareholders, besides being interested in and wedded to market expansion.

Higher Education at the Mercy of Capital

Universities in the public sector are being increasingly integrated into the private sector as they compete for income and equity from the sale of their teaching and research. As a result, much attention and speculation has focused on the parasitic nature of recent corporate association with

higher education (Buchbinder & Newson, 1990; Newson & Buchbinder, 1988). From a pre-Fordist artisan craft process, teaching has been transformed into a Fordist organized mass-production operation and now to a post-Fordist process laden with discourses that promote flexible, nontraditional lifelong learners (Dearlove, 1997, p. 68). Processes such as the proletarianization and deprofessionalization of academia combined with a parallel rise in centralization and managerialism are harbingers of capital's global and domestic influence on legislative policy (Barrett & Meaghan, 1990; Rhoades, 1998; Tudiver, 1999). The interconnectedness of these categories makes it nearly impossible to separate their influences, motivations, and points of departure. The following discussion develops a framework for uncovering this interconnectedness but also provides an opportunity to demonstrate the continual and purposeful restructuring of higher education's citizens.

Proletarianization of the Academy

Many would argue on several grounds that the term *proletarianization* is unadvisedly used. It is a misnomer, since it does not effectively capture processes at hand: It negates agency and opportunities for resistance, it frames the current trends as only top-down processes of implementation or control, and it is misapplied when referring to white-collar professionals. However, within the context of this paper, proletarianization shall be defined as a method of constructing and analyzing occurrences from a labor process perspective ultimately concerned with the control of workers by managers representing the interests of capital. In other words, it is the transfer of control over work from faculty to administration and external entities (Bloland, 1999, p. 111). There are two areas of focus: faculty stratification and the advent of distance education. Both have meaning not only for the gradual erosion of professional autonomy but also for the erosion of control over intellectual property.

Stratification refers to many intersecting processes, all of which result in the "schizophrenia of faculty" (Manicas, 2000). Managing the university as a corporation is evidenced by the rearticulation of teaching as a unit of resource and the creation of a flexible labor force as a contingent and necessary by-product. Reduction of labor costs has also been achieved through early retirement and the recruitment of younger, less costly faculty into nontenured stream positions. Part-time faculty represent an inexpensive labor pool that can be expanded and contracted in response to the market, and they are usually not in a position to make expensive or disruptive demands. As well, "employment of part-time instructors alters the fundamental character of university education. Teaching is supposed to be informed by research, on the premise that good researchers keep up with developments in their fields and bring them to the classroom" (Tudiver, 1999, p. 164). The result of the realignment and restructuring of faculty composition is the creation of a reserve army of temporary piece worker.[18]

[18]This mirrors Noble's (1977) discussion of a reserve citizen army.

Evidence of a divided instructional staff is found when examining the University of Toronto faculty and administrative staff composition (University Affairs, 1998).[19] Further examination of these statistics also illustrates not only gendered[20] and racialized constructs at work but also the use of graduate students and postdoctoral fellows. A comparison of administrative staffing to that of faculty reveals that while 92 percent of administrative staff are full-time employees of the university, there exist far greater numbers of part-time and nontenured stream professorial staff, evidencing greater labor-force flexibility. Graduate students, research associates, and postdoctoral fellows[21] are quite often an overlooked but necessary pool of both intellectual and physical labor. As well, Ph.D. candidates produced in droves have become a flexible workforce in a post-Fordist economy (Manicas, 2000). It is interesting to note that the overwhelming majority of persons in this category are involved in the physical and life sciences, disciplines most closely tied to industry. While the data do not reflect all variables, it is also important to recognize that divisions within these categories are further widened by playing off one part of the academy against the other via mechanisms such as internal and external recognition, remuneration, and mobility.

Distance education also reflects the proletarianization of the academy. It has generated cause for concern among academics, because it represents more than just the dissemination of knowledge. Although there are powerful economic reasons for developing online and distance education by using communication technologies to offer new products to an expanded customer base, ultimately, faculty control over the curriculum is eroded. Not only are faculty physically removed from course delivery and the students; they can now be located and recruited globally from an unlimited number of well-trained and inexpensive pool. "Teacherless courses become products that management can deliver without worrying about labour relations" (Tudiver, 1999, p. 163). As a case in point, Noble (2000), in a series of Internet-based articles titled *Digital Diploma Mills*, addresses the issue of online education. Education, according to Noble, has become the market, not the product. Technology is employed, ultimately, to gain control over performance, course content, and intellectual property rights. This transformation is predominantly initiated and implemented in a top-down fashion, often without the involvement of faculty or students. In fact, Noble believes that society is witnessing the conversion of intellectual activity into intellectual capital and therefore intellectual property by virtue of two phases: commodification of the research and of the education function.

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[19] Categories are formalized in the following ways: full-time versus part-time, tenured versus untenured, as well the hierarchical layering from lecturer to full professor.

[20] Of the 1,712 full-time tenured/tenured stream faculty, 46 percent are males with full professorships as compared to 8 percent of women.

[21] Their numbers amount to 10,303 as compared to 2,937 faculty and 2,993 administrative staff.

Deprofessionalization of the Academy

Bok (1982) states that the "introduction of a different set of motives, oriented toward private gain, threatens to reduce the credibility of the scientists involved and to diminish their capacity either to elicit complete trust from their colleagues or to secure the unmixed admiration of the public" (p. 151). Among the processes that lead to continued deprofessionalization are censorship and the erosion of collegiality and professional autonomy.

Censorship comes in different forms, as previously discussed concerning university-industry collaborations. It takes shape in decisions about the type of research that is both internally and externally funded. This in turn is indelibly linked to publication, recognition, and wages, all of which are intertwined with the hiring and tenure processes. Newson (1992) suggests that although fund-raising, as described in this example, may be necessary, it impedes the independence of the university. In fact, "links between the university and the corporate sector introduce and support relationships among academics and corporate clients that supersede relationships among academic colleagues as members together of a collegial structure" (p. 237). These types of relationships, coupled with research in disciplines close to the market,[22] which can produce considerable commercial value, suggest that the impact of external market and government pressures that provide incentives to faculty and administrators to change the mix of research from predominantly discipline-inspired research to market-driven incentive systems is substantial and of great concern (Bloland, 1999, p. 109). In fact, "priorities and criteria of the corporate agenda are being embedded in the very judgements that are made about which research projects and intellectual quests will be taken up by academics; in other words, about the content of social knowledge itself" (Newson, 1992, p. 237).

The disparities in authority, influence, and power created through the intersection of these processes, combined with the intimate collaboration between industry and the research community, have adversely affected both communication and morale within the academic setting and severely undermined collegial relationships. Dearlove (1997), in his examination of notions of collegiality, highlights several key factors that are affected and altered by these processes. Of most importance are the notions of autonomy and self-regulation. He asserts that

> universities should be autonomous institutions with sufficient free funds to enjoy independence from financial pressures. . . . [P]articipatory democracy, not representative government, is the ideal. . . . [E]very academic is of equal worth . . . [and] the university is the faculty. (p. 58)

The erosion of professional autonomy is essential to the neoliberal agenda, contributing to external influence and control upon a body of classically self-censuring workers (Meaghan, 1998). It is important to consider

[22] Examples include technology fields, agriculture, engineering, and the biological sciences. See also Slaughter and Leslie (1997).

the concept of the academy as a professional group as well as the autonomy of the university and its faculty before analyzing their intersection and erosion. A profession is defined by several features, which include, but are not limited to, a knowledge base that requires a lengthy period of education, a claim to authority in an area or discipline, and a body or means of self-management and self-regulation. In considering the autonomy of the university, there exists no instance of total autonomy, evidenced by its history of financial dependence on the church or legislative dependence on government. However, as a group of workers, faculty have enjoyed varying levels of autonomy within the institution, underpinned by its stake in governance through the function of its Senate. Brubacher (1977) believes that a quintessential aspect of faculty, as a republic of scholars, is that in matters of expertise, the experts should be left alone. However, there are limits to faculty's autonomy. Professionals are subject to faults such as "lethargy, prejudiced conservatism, and intolerance of innovation" (p. 75). There is also a question of creating a balance between service to the public domain versus the quest for innovation and "enlightenment." In highlighting this dilemma, Brubacher (1977) asserts that "the ultimate legitimation of autonomy must be loyalty to the truth" (p. 75). This certainly begs the question of whose truth and in whose service? Traditionally, competition and self-regulation within the academy differ in principle and in practice from the demands of business and the "free market." Faculty members gain recognition and reputation through a process of peer review, whether internally in the tenure review process or externally by means of submission for publication. As Bloland (1999) notes, "the best method of conducting this competition is through professor- and discipline-inspired research, where the standards are not so muddied by questions of marketability. Nearness to the market invites external groups to insert nonprofessional standards to determine worth" (p. 117).

These discussions continue to highlight that professions themselves are inherently internally stratified, in large part due to the university's construction via a process of top-down institution building. Rhoades (1998) thinks it ironic that faculty still believe they are independent professionals; he not only asserts that they are "managed professionals" but feels that collective bargaining agreements themselves "constitute and define much that contributes to stratification among faculty" (p. 19). Essentially, collective bargaining has its limitations (Barrett & Meaghan, 1990). As a particular mode of resistance, collective bargaining, while not seemingly an oxymoron in nature, becomes precisely that in practice. In the process of consolidating certain types of power to faculty, collective bargaining simultaneously undermines and disenfranchises certain constituencies. Collective bargaining may become a form of collectively self-defeating behavior. From a microperspective, collective bargaining not only upsets collegial relationships but is also adversarial by definition. The mere discussion over whether to unionize at all affects collegiality, since unionization effectively restructures citizens of the university. Colleagues become employer and employee, and the collegial mode whereby faculty and administration were equal partners dissolves. Reason is subordinated to coercion and the privilege of status in-

fringed upon by the authority of the "contract." Brubacher (1977, p. 230) believes that

> although faculty undertook collective bargaining as a means of self-protection from the dangers of budgetary cutbacks and preserving their roles in the decision making process, these same collective agreements also legitimated the existence of the administration as a separate entity and provided the vehicle for operationalizing its agenda, as one of two contractual partners.

Bargaining also becomes problematic when considered from a global perspective. Recent disputes and reform of bargaining rights and labor mobility through mechanisms such as GATT and WTO involvement are shifting control from local communities to extra-local ruling apparatuses (Smith, 1990).

Managerialism and Centralization

The development of collective bargaining within the university is accompanied by an expansion and differentiation of university administration, while accommodating and facilitating the erosion of autonomy. Managerial expansion in postsecondary institutions, and the corresponding control over financial and physical resources, is occurring at an increasingly faster rate than the corresponding increase in numbers or control among other constituencies. This is evidenced by an increase of in-house management-oriented publications, faculty seminars aimed at increasing efficiency and productivity, and an increase in large, well-furnished, and well-serviced managerial spaces in contrast to small spaces allocated to faculty offices. Clearly, there has been a philosophical rupture from human capital theory to human resource management, that is, a shift away from students' needs for career preparation toward the management of acquisition of skills required by industry. According to Newson (1992), not only do administrators have values and orientations toward the university that are significantly different from members of the academy, but in fact, the prevailing administrative approach is more often than not outdated and therefore not even good business practice.

One such business practice is grounded in current discourses of accountability. Along with the transformation of the meaning of the word *relevance,* which has "become a pseudonym for developing knowledge that will have a practical application in the service of economic growth and technological innovation," accountability entails a paradigmatic shift to activities that are measurable or that can be measurably constructed (Newson, 1992, p. 238). Cassin and Morgan (1992), as cited in Newson and Polster (1998, p. 176), demonstrate that standardized evaluative measures and systems of measures have contributed to the centralization of management. As is the case with other discourses and textual practices, there exists a sharp dichotomy between measurement as technology and measurement as a basis for decision making. The textual practices of documentation, performance indicators, and scientific management technologies will now be examined and their intersections discussed.

Newson and Buchbinder (1988) believe that the viewpoint and collective interests of academic workers in universities are being increasingly marginalized in the emerging decision-making process. In fact,

> the political strategies previously adopted by academics to influence decision-making are not effective in relation to this kind of decision-making via documents. . . . Although these bodies continue to be assigned a final approval role in the 'decision-making by documents' process, this approval is relatively inconsequential in the actual shaping of the text of the documents. (Newson, 1992, p. 234)

Restructuring governance as well as departmental structures fundamentally alters collegial participation in decision-making processes and, through the practice of documentation, silences constituencies of the institution.

Performance indicators are another discursive tactic,[23] which allows for the categorization and differentiation of institutions as well as individuals. "We conceive of performance indicators as technologies for managing and controlling the academic activities that flow within and through institutions of higher education" (Newson & Polster, 1998, p. 174). International collaboration, both among systems of higher education administration and through WTO legislation, structures and actively cultivates a milieu whereby faculty can be controlled globally. Performance indicators

> make it possible to replace substantive judgements with formulaic and algorithmic representations. . .[T]hey intrinsically reorder the social relations of academic work, . . . they also reconstruct the relationship between those who perform academic activities, on the one hand, and, on the other, those who determine how to evaluate them, the criteria of evaluation, and the interpretation of the consequences of the evaluation. . . . [P]erformance indicators make it possible to separate the work of identifying and conceptualizing issues or problems from the work of interpreting and resolving them. . .shifting from collegial forms of control within autonomous institutions to managerial forms that give priority to objectives that are not necessarily academic. (Newson & Polster, 1998, p. 178)

There are those who argue that higher education faculty will not be any more successful than workers in other industries who have tried to resist the intrusion of scientific management practices (Skolnick, 2000). In fact, the justification for resistance often appears irrational, illogical, or unfounded. After all, are not performance indicators simply just a "legitimate demand for accountability" from a public whose interests the faculty supposedly serves? Resistance to the use of performance indicators is often forsaken in the interest of job security, maintaining the value of their own expertise, and appearing less political (Newson & Polster, 1998, pp. 179, 186-87).

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[23]See also Bensimmon (1995) on discussion of Total Quality Management (TQM).

The Rearticulation of Knowledge as a Private Good

By definition, competitive markets[24] either fail to produce efficient quantities of public goods or do not produce them at all since individuals will not volunteer to pay for them, and firms in the private sector producing them will earn zero profits. Competitive markets also operate to maximize social surplus by accommodating all transactions that are Pareto optimal,[25] meaning that it is impossible to rearrange consumption or to reallocate inputs such that one person would be better off and no person would be worse off. However, "for the well-being of economists in general and cost-benefit analysts in particular, perhaps it is just as well that the conditions necessary for perfect competition often do not hold, and that sometimes competitive behavior does not result in a socially optimal allocation of resources. In such situations markets are said to fail" (Townley, 1998, p. 64). Without engaging an economically strict definition of the social optimum, one can see that the global resource allocation of food and water, for example, is less than socially optimal or desirable.

However, for the purposes of this argument, I will detail other circumstances in which markets are said to fail and how capital is implicated in the process. For instance, perfectly competitive markets assume perfect information; that is, technology used to produce the good or service is known perfectly and universally available. The continual enclosure of the "intellectual commons," the prospecting of the world's biological commons, and the patenting of the human genome are all instances that run contrary to the notion of perfect information. Perfectly competitive markets also operate such that so many firms produce the good or service that no single firm has any control over its market price; furthermore, so many households consume the good or service that no one household can manipulate the price it pays through its consumption decisions. However, if households and firms are one in the same, that is, capital controls the production and consumption of technology, then once again, markets are said to fail. Most important to the notion of perfectly competitive markets is the existence of negative externalities, which require government intervention to reach a socially optimal output since competitive equilibria will not be efficient. While the proliferation of intellectual property rights, as well as their assignment to corporate interests, is one example of capital's capture of any social surplus, the more important concern is delineating any negative externalities and levying an

[24] The following conditions are necessary for perfect competition: (1) The good or service is homogeneous (i.e., the output of one producer is in no way different, even perceptually, from that of any other producer). As well, information (e.g., technology) is known perfectly and available to all. (2) The good or service is a private good. (3) Firms are price takers (i.e., no single firm has any control over the market price). (4) Households are assumed to be utility maximizers as well as price takers (i.e., no one household can manipulate the price it pays through its consumption decisions). (5) Firms are free to enter and exit the industry at will.

[25] Considering only hypothetical compensation, a double criterion is satisfied if it would be possible for gainers from the act to compensate losers and not possible for those who would lose to compensate others for forgoing the act.

appropriate tax to the firm. Here cost-benefit analysis faces a theoretical dilemma, namely, the valuing of a human life or possible environmental hazard. Both of these concepts are relevant here, as new technologies, development economics, and WTO initiatives are all grounded in knowledge produced or co-opted through systems of higher education. Other externalities include but are not limited to citizenship production, equity and accessibility, and the destruction of an "intellectual commons." Society cannot even begin to set a price on the value of questions not asked, research not pursued, or technologies not sufficiently problematized, because they are not aligned with the interests of capital.

At this point, I will examine the economic definition that classifies and treats knowledge as a public good, demonstrating how it behaves and functions as a private good in the marketplace. As a public good, knowledge must exhibit nonrivalry in consumption. A "monocultured" approach to technology coupled with an ever-tightening leash on intellectual property in the hands of fewer agents challenges the assumption of nonrivalry. Public goods must also exhibit nonexclusion, but patent legislation reform, driven by an imperialistically inclined capital machine, is indicative of movement toward exclusionary practice. As already mentioned, patents were originally intended to promote trade and commerce and avoid overaccumulation of technology; not only do critics suggest that capitalism is experiencing a crisis of overaccumulation, but the evolution of academic capitalism within institutions of higher education lies in direct opposition to the spirit and essence of patent law.

Magnusson (1998) suggests a "general movement away from modernist, bureaucratized forms of social organization . . . [toward a] Post-Fordist emphasis on flexible production, niche marketing, and the dissembling of bureaucratic structures, [which] has ushered in a new era in the social science related fields" (p 122). I argue that capital has skillfully re-created a neo-Fordist relationship with systems of higher education, capturing any social surplus and shifting the cost of negative externalities to the individual. In theorizing late capitalism, I wish to mesh the concepts of Fordism and post-Fordism together into neo-Fordism. Neo-Fordism operates within a climate of postindustrial economics, characterized by rapid advancements in science and technology, global oligopolies operating with individual rights, flattening institutional hierarchies, the discourse of teamwork, and flexible production using fewer, more interchangeable workers. Neo-Fordism maintains the Fordist culture in which the worker and the consumer were one in the same; that is, capital, through the corporatization of higher education, not only produces graduates but also consumes them. Neo-Fordism professes the discourse of conflict of interest as commonsense reality. The shareholders of higher education, who own spin- off companies, maintain positions on national councils, and hold equity in capital interests external to the academy are valorized as necessary and contingent participants in the free market of technology. The irony and crime is that the public domain, that is, the individual tax payer, is currently subsidizing research and development that capital interests must participate in, for sourcing new markets and expanding old ones is a necessary evil of capital-

ism. Capital skillfully shifts the risk onto the public purse while reaping the rewards of equity and private property rights.

Magnusson (1998) also suggests not only that capitalism is ideological fantasy but that higher education is implicated and functional in constructing and maintaining this fantasy. Using Zizek's framework, she asserts that ideology is in fact not a totalizing discourse since there is room for questioning, and in fact, most individuals do not take ideological truths seriously. Nevertheless individuals behave "as if" the ideological proposition were true, participating in an ideological fantasy. As a case in point, economic theory is structured to achieve equilibrium yet is reproductive of crisis and inequality. Examples abound wherever one chooses to examine—a crisis involving the failure of currencies, or a widening income or information gap between the First and Fourth Worlds. We are also part and party to the personification of central concepts in the ideology referred to as economic theory. As a discourse, free trade allows us to talk about the components of capitalism "as if" they are human beings, endowed with rights and privileges. An example of this is the notion of capital. We speak about its movement, its demands, and its interests. In fact, the WTO has imbued transnational corporations with the rights that were once held only in the private realm.

The current environment in higher education has facilitated the enclosure and rearticulation of knowledge as a private good while maintaining the ideological fantasy as that of a public good operating in the free market. Progressivist discourses in the social sciences in general and economics in particular are "ideologically aligned with corporate interests and the corporate establishment but [are] cast as a liberal democratic discourse" (Magnusson, 1998, p. 114). Both the producers of knowledge and the sites of production are complicit in maintaining and promoting this fantasy. Globalization and its presumption that more is always better than less, is sold as inevitable, rather than socially constructed. Neoliberal policies, which exhort the empowerment of the free market and the dismantling of the welfare state, are seen as an economic and social panacea. Capitalism is productive of monocultures, which destroy diversity and alternatives, the base from which humankind seeks knowledge and innovation.

> Monocultures of the mind do not merely create uniformity, they create apartheid. . .hierarchy, domination and even dispensability. . . .Diversity as a mode of thought, a context of action . . . offers us a survival option. (Shiva, 1993a, 4)

Man's recognition of *his* complicity in *his* dispensability is vital. *His* ownership and stake in the redefinition of how capitalism itself is constructed is vital to reversing the chains, which have become fettered around *his* feet. The dispensability of *man* is achieved by the final alienation from *his* tools; namely, the tools of mental production.

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