



FCJ-119 Subjectivity in the Ecologies of Peer to Peer Production

Phoebe Moore
University of Salford

Introduction

Free (Libre)/Open Source Software (FLOSS) is an open, evolutionary arena in which hundreds and sometimes thousands of users voluntarily explore and design code, spot bugs in code, make contributions to the code, release software, create artwork, and develop licenses in a fashion that is becoming increasingly prevalent in the otherwise hugely monopolised software market. This 'computerisation movement' emerged as a challenge to the monopolisation of the software market by such mammoth firms as Microsoft and IBM, and is portrayed as being revolutionary (Elliot and Scacchi, 2004; DiBona, Ockman, and Stone, 1999; Kling and Lacono, 1988). Its 'ultimate goal' is 'to provide free software to do all of the jobs computer users want to do and thus make proprietary software obsolete' (Free Software Foundation, 2005).

However, if it is to succeed in bringing about a new social order (Kling and Lacono, 1988), this movement must be re-evaluated from a critical standpoint through a look into the practices of knowledge production based on radical licenses for property sharing and development such as the General Public Licence (GPL) and the emerging subjectivities of participants. Free Software may be viewed as a social movement while Open Source is perhaps a development methodology, but it is not always necessary to isolate analysis to one or the other, firstly due to the extensive overlap in software communities, and secondly because their rhizomatic roots emerge from a shared intellectual and moral response to the exploitation of markets by powerful firms (see Elliot and Scacchi, 2004). Here, I query whether the activities of collaborative software producers as well as hardware production communities such as those found in FabLabs, which release playbots and other blueprints for machine replications as well as agricultural and construction initiatives, can indeed be perceived as revolutionary due to their subversive work and production methods. The recursive communities (Kelty 2006; Powell 2008) that develop around these practices are linked, with shared practices, goals and self-perceptions. People's emerging subjectivities are the most important dimension of such radical production ecologies, because they reflect both the immaterial and material dimensions of the inherently political projects involved.

Social theorists including Hardt and Negri (2001), Boutang (2008), Lazzarato (1996), and Virno (2002) discuss new technologies' appropriation of work as an immaterial and conceptual (and sometimes slavish) activity. The extraction of surplus value from work in the creative and cultural industries, as well as from any employment relationship built on new technologies, is a new and unique category of potential exploitation. This is interestingly also less bounded to the Fordist piece rate work structures of management and the wage relation. The appropriation of the self, of the hegemony of the subject involved, is part of the neoliberal capitalist project. This can also be seen in education and employment policy, as I have demonstrated in my 2010 book (Moore, 2010). There I claim that governments and the elite transnational capitalist class struggles to adapt to, and subsume, potential revolutionary factions within the knowledge and information economy. These struggles provide tensions within the P2P community likewise, as I indicate in my work with Paul A. Taylor (2009). This work analyses participants' motivations for getting involved in usually unpaid FLOSS projects when simultaneously facing the precarious world of work. In spite of these tensions, I argue here that the creative and networked industries provide the components for creating post-capitalist relationships, or if that is somewhat optimistic, at least a challenge to capitalist relationships. Explicit methods of immaterial and material production and emerging P2P ecologies are built on tenets that defy capitalism and allow subjectivities that blossom outside of the dominant models that are fraught with competition and rivalries.

At the University of Maine Law School's Fourth Annual Technology and Law Conference, Portland, Maine, Professor Eben Moglen argued that:

Free software is an invocation for particular social purposes of the ability to develop resources in commons... it is the single way in which we have produced the most important works of Western intellectual achievement since the Renaissance. It is also the way in which we have managed for all time fisheries, surface water resources, and large numbers of other forms of resource beyond human production. Free software presents an attempt to construct a commons in cyberspace with respect to executable computer code. It works. (Moglen, 2003)

FLOSS projects have an intense focus on open source and the collaborative 'philosophies' of free software. Yet many hardware production projects, alternative currencies, and FLOSS-related ecological and environmental activities also share a concern for the planet's sustainable future. In the process, they rework the production of subjectivity. For example, geek publics, as emerging from community wireless projects, are another instance of a relevant oppositional subjectivity (as seen in the work of Powell [2008]).

This article, then, is about the subjectivities of people involved in peer to peer (P2P) production. P2P is a model or perhaps, better termed, an ecology of production that aims to defy and resist the hierarchies and the rules of ownership that drive productive models within capitalism. It may also offer possibilities for workers' formations of radicalised subjectivities. The argument that the P2P ecologies of production are groundbreaking and emancipating is found for example in the work of Bauwens (2009) and Benkler (2006), among others. Criticisms leveled at the phenomenon include those contained in case studies by people involved, such as Zawinski's (1999) account of work on Mozilla. Critics point to the clique-like activities of producers, suggesting that P2P producers 'cease to be a bazaar model and turn into a core team, which to a lot of people is a polite word for a clique' (Cox, 1998).

In response, I will investigate a range of projects that aim to provide a lived alternative to the existing dominant

modes of capitalist production. These provide an alternative model, better termed an 'ecology'; not a *model of* capitalism, but an *ecology* of potential post-capitalism. The increasingly successful ecologies of cooperative and collaborative production have become a threat to globalised information capitalism, as much through contributors' value systems as through material outputs. In this sense, the global capitalist passive revolution that I have identified in other work (Moore, 2007, 2010) is likely to be challenged.

I look at the media ecology or 'ecosophy' of P2P software and hardware production as something that begins with people's subjectivities, is perpetuated and reproduced by subjectivities-in-common, and becomes the core for a potential revolution. Networked communities of P2P production are, in the sense of free software, virtual. These groups are made up of geeks, artists, hackers, designers, carpenters and programmers, all of whom are committed to a radical ecology based on tenets that defy the proprietary and competitive relations that dominate the majority of productive relationships in the current, seemingly post-industrial, digital age. P2P production communities are composed of the following three dimensions: social relations, human subjectivity and the environment (see Guattari, 2008, for a breakdown of these categories). It is the new configuration of the relations between these that could effectively challenge existing hegemonic social relations of production. So this article first looks at how critical theorists may understand the relationship between P2P activity and the subjectivities formed within networks. More specifically it looks to the way the objectives of producers and artists affect the development of subjectivity within recursive communities. The article then looks at the activities within communities of the software and hardware producers themselves.

Considering Subjectivities

Conceptions of how subjectivities are formed are now dramatically altering in the light of developing technologies and the new ways in which people interact with technology. The dark side of this, reflected in government policy, is not the only dimension of this transformation. In fact, there is an emancipatory potential within relationships that can now be established with the new uses of technology, and with new patterns for governance outside old industrial capitalist hierarchies. On the other hand, attempts to harness the potential for revolution, evident within the P2P production movement which I discuss in following sections, are also increasingly evident in government policy that tries to dictate and define subjectivity through educative means. The struggles over the vectors of subjectivation involved, as discussed in Guattari (2008) and Colman (2008) are, as Goddard states in the present volume, part of a 'mental ecology in which sensibilities, intelligence and processes of desire take place'. This is thus also the 'site where politics take place' (Goddard in this issue).

If P2P production becomes an alternative and revolutionary space, it will be via the possibilities for the formations of revolutionary subjectivities that may emerge as people become increasingly involved in 'passionate work' in the digital and cultural economies (McRobbie, 2009: 123) where this kind of production occurs. This could ultimately involve challenging global capitalist hegemony, not only through a new distributed aesthetics but also new affective subjectivities. The subjectivity as well as social status of the capitalist him/herself is challenged with competing collaborative forms of subjectivity. As these new types of self identifications are developed within organic social movements, transformation becomes increasingly possible.

Here Matthew Fuller's (2005) provocative adaptation of the concept of media ecology is useful. Fuller refers to media *ecologies* that allow for more dynamism between the relevant components, relationships and methods by which ecologies are co-created, often in response to a perceived absence of something in society, or as an attempted response to perceived social violence. For Fuller, for example, pirate radio emerged in the context of people's desire for fringe cultural expression and for multiplicities emerging from 'multiple networks of production, multiple locations ... multiple media forms ... sustained by scenes and rhymatic drives that refuse to give in' (2005: 52). Rather than the traditional static relationships of mainstream media such as broadcaster/audience, producer/consumer, manager/managed, these new media ecologies allowed people the space for self expression and thus creation of alternative subjectivities, as well as potentials for the transformation of the world around them with the use of technologies.

To elaborate the potentials in new subjectivities in this context, one can turn to Deleuze and Guattari's (1987) adaptation of Foucault's treatise on subjectivation, or the process of becoming subject, as a biopolitical power struggle. To challenge the 'major crisis of our era', Guattari emphasises that we need to work together to cultivate:

- A nascent subjectivity
- A constantly mutating socius
- An environment in the process of being reinvented. (2008, 45)

Here, I intend to look at a lived example of the commons to identify how the multitude may express itself in a potentially subjectively revolutionary ecology, wherein production of the self can be owned separate to the results of interpellation, where capitalism is no longer the horizon of subsumption and where multiplicity can become both singular and shared in a way that disrupts the contemporary hegemony of capitalist norms, such as the proprietary ownership of ideas within digital production.

However, this mode of aesthetico-political subjectivity differs from the more celebrated forms of 'creative freedom'. Most critical theorists have viewed aesthetics as a domain reserved for artists and 'creatives', and this paralysis continues in the work of Richard Florida and Charles Leadbeater, 'insiders' who busily decide on best working practices and design the future of work (Amoore 2006, 26), and who have celebrated promises in which 'creative freedom, design stardom, and self-expression drives designers to work in temporary or freelance jobs and to forgo financial security thus feeding capitalism an endless supply of young, fresh talent' (Turner-Rahman 2005). As Withford points out however 'inside this bourgeois dream lie the seeds of a bourgeois nightmare' (1999, 5-6). McRobbie (2002) and Amoore (2006) note that this exhilarating promise in practice facilitates the capitalist project and makes it difficult for workers to unionise and thus to protect themselves.

On all nodes of the spectrum from the far right to the radical left, changes to the workplace, the removal of job security and casualised professional work alongside widespread casualisation, and the rise of flexibilised precariat maintenance and/or types of service work, are issues that have been associated with the rise of technological developments during what has been called the age of information, 'new times', the global knowledge-based economy, high-technology societies, technetronic societies, and so on. Capital has been able to reinvent and 'socialise' itself in these contexts, as seen in the restructuring of education around a perceived ideal type of employable and socialised worker. The result is that we are seeing a conscious fusion of capital with society that can have a range of affects on people surviving within its grip.

In this situation, labour has supposedly become dematerialised, through the elimination of skill as tangibly measured and explicitly identified with the producer herself. This is a contemporary continuation of the capitalist project of alienation. In addition, work is removed from fixed capital through the transference of the practices involving owned property into unprecedented arenas of commodified knowledge by way of information technologies. Labour power is thus removed from the factory and immaterialised through deterritorialisation, which is the 'disconnection of the conscious organism from its identity code, the effect of non-acknowledgement of the imaginary' (Berardi, 2009: 150). With identity and thus representation removed, cognitive work appears to exist in direct competition with the computer. Post-Fordist capitalism realises Stalin's formula: 'man is the most precious capital' (cited in Gorz, 1999: 6). The individual is now expected not only to work, but also to valorise his/her own work, and to become a competitive entity with capital itself through the incorporation of his/her own subjectivity into the practice of work.

The infatuation with a new creative world of work or 'playbour' hints toward a seeming turn from labour in the traditional model wherein surplus value is owned by capitalists. Theorists of cognitive capitalism suggest that knowledge workers are expected to contribute endlessly to value creation by way of personally directed lifelong learning and mass intellectuality. Virno and the advocates of *operaismo* note that work is not just alienated from the producer in the capitalist relationship of production, but in fact, life is completely subsumed by work (2002). The Italian 'workerists' disagreed with Gramsci's thesis on the war of position (which loosely, is the idea that positioning one's strategic advantage is as important as the attack) and instead advocated direct action: the *multitude* that results is a movement that will enact radical transformation and change through a radical configuration of subjectivities. While this movement has differences with Gramscian theories of power, the commitment to ideas and emancipatory possibilities located within the superstructure are shared. [1]

A growing population of over-qualified, highly skilled individuals now work in the 'internal margins', or the internal ghettos, that line the sidestreets resulting from a growing lack of stable employment within the market for knowledge workers. As a result of the emerging impermanence of work, and as knowledge becomes increasingly commodified, several contradictions have emerged. For example, 'reflective statements' and cognitive scaffolding (Pedagogy for Employability 2006) are prioritised over recursive community building, or commons based production. Assumptions extend into the realm of people's abilities and skills, despite the difficulties that knowledge work poses for traditional distinctions between the objective or technical skill needed for task related work and the subjective, social capabilities that are now increasingly measured by employers in a 'war for talent' (Brown and Hesketh, 2004: 65-88).

Peer Production and the Commons

The peer to peer production movement originated in the Free Software and Hackerspace communities. These communities represent a social movement to an extent, although 'movement is an awkward word; not all participants would define their participation that way' (Keltz 2008, 113). Some people participate because this is a 'pragmatic methodology' that shares 'practices first and ideologies second' (113). Nonetheless, FLOSS and the open hardware community is composed of some radical people who are committed to explicitly go beyond the strictures of capitalist production processes in a way that can overcome the measures of value that have controlled the employability (and thus subjectivity) discourse until now. While government led employability and skills campaigns have created a specific ideologue of the seemingly employable worker, the peer production protocol is composed by an ecology of interactivity that offers an alternative set of practices to capitalism. This is an ecology in which people are seen

to be free to individually and/or collaboratively and cooperatively identify subjectivity, or subjectivities, that are not confined to the straightjacket of competition, profit and proprietary-driven action, or the associated values these activities require.

Yet where are P2P collaborative spaces in today's real world? These include Media labs based on the model of Access Space or the Brazilian Pontos de Cultura programme, which have applied the P2P approach on a national scale; coworking spaces and social media cafes (like London's Tuttle Club); Fab Labs for manufacturing, found in locations as diverse as Iceland and Afghanistan; Vinay Gupta's Hexayurt project; Studio spaces like TenantSpin, the micro-TV station in Liverpool based in a flat in a towerblock; Hackerspaces; Community Media (Hine 2009); and Intentional Communities which include 'ecovillages, cohousing communities, residential land trusts, communes, student co-ops, urban housing cooperatives, intentional living, alternative communities, cooperative living, and other projects where people strive together with a common vision' (Intentional Communities 2010). These radical spaces are based on the following principles as set forward by the P2P Foundation:

Our mission is to extend the Open Source model to the provision of any goods and services—Open Source Economics. This means opening access to the information and technology which enables a different economic system to be realized, one based on the integration of natural ecology, social ecology, and industrial ecology. This economic system is based on open access—based on widely accessible information and associated access to productive capital—distributed into the hands of an increased number of people. We believe that a highly distributed, increasingly participatory model of production is the core of a democratic society, where stability is established naturally by the balance of human activity with sustainable extraction of natural resources. This is the opposite of the current mainstream of centralized economies, which have a structurally built-in tendency towards overproduction. (P2P Foundation 2009)

These post- or alternate-capitalist suggestions for communities that are dedicated to the 'commons' are claimed to be far more resilient to capitalist subsumption than previous communities. While market-based capitalism is based on the private ownership of the means of production and hierarchically organised corporations, this new ecology is based on shared ownership and shared upgrading/product development rights, and therefore activities that by their very nature do not permit proprietary behaviour. This movement recognises that workers are becoming increasingly empowered, a group who 'unlike factory workers basically own or control their own means of production: i.e. their brains, computers, and access to the socialised network that is the internet' (Bauwens 2009, 2). They are thus able to create scenarios or ecologies of co-creation which are decidedly 'not just about firms improving their social marketing, open innovation, community-building and learning efforts to generate new proprietary and valuable knowledge with/from their customers' (Lawer 2009). These self-organising communities impose a threat to the hegemony of the traditional firm, and because of their radical organization by way of non-market production 'there is a limit to how far such firms can "own" channels of knowledge production and are able to manage engagement when they apply a market-based logic and its associated capabilities' (ibid., citing Benkler, 2006).

People who are interested in co-creation and peer production are labouring and producing in a way that should not be treated as a curiosity or as a fad. Passionate and intelligent people living in a multitude of locations are volunteering online, for example, to co-author Wikipedia, thereby constituting a collective challenge to classical regimes of knowledge production and verification (Benkler 2006, 5-6). What we are seeing is a 'new mode of production

emerging in the middle of the most advanced economies in the world' (ibid.). This ecology of production poses a real threat to the current dominant mode and people involved are increasingly able to circumnavigate the supposed reflexive requirements for preparing themselves to become and remain employable. The autonomous worker of a networked information economy, as well as the producers of open manufacture based communities, have unprecedented power to cooperate across open spaces that were previously unavailable in the factory. Without a wage relation between the traditional definitions of employee and employed, the possibilities begin to emerge for overcoming the fundamental strictures of the capitalist employment relationship. The cultures that have emerged from this process have been discussed as being more truly democratic for nearly a decade. Both consensus and democratic means are used to lead towards becoming more fully individual or self-governing. This means using consensus or democratic means for vital infrastructure; the best and most widely adopted outcomes are from the adaptive systems created that enable an individual freedom of adaptation, without the knowledge of or permission by core developers, as these adaptations do not endanger, but merely enrich, the core design. Peer production holds the possibility for a 'genuinely new form of production' that is based on 'permission-less self-aggregation around the creation of common value' (Bauwens 2009).

Bauwens (2009) separates the terms peer production, peer governance and peer property to give a 'beginner's guide' to the political economy of P2P production:

- 1) peer production: wherever a group of peers decided to engage in the production of a common resource
- 2) peer governance: the means they choose to govern themselves while they engage in such pursuit
- 3) peer property: the institutional and legal framework they choose to guard against the private appropriation of this common work; this usually takes the form of non-exclusionary forms of universal common property, as defined through the General Public License, some forms of the Creative Commons licenses, or similar derivatives.

These practices differ significantly, indeed almost diametrically, from the traditional versions of firm-based capitalist exchanges and production. Participants are involved in constructing and reconstructing intentionally radical economic and social situations. The management and governance of related projects needs to be critically examined to assess to what extent community-based ecologies found within the FLOSS community can challenge the traditional understanding of property rights, ownership, motivation, complexity and the 'human firm' (Tomer, 1999) along with challenges to rational actor and corporate models. The community-based movement is linked to the re-creation of subjectivities that exist outside of capitalism, can produce its own economic 'truth' regime of value, and has begun to display significant possibilities for challenging the dominance of competitive capitalism. Yet the cultural and macro-structural properties of community-based ecologies of work must be contrasted to those of the firm to discern their relevance and implications for broader ethico-political changes within and across societies. For instance, in the present volume, Parikka refers to the emerging media ecological methodologies that can identify and outline 'subjectivities that do not follow the normal definitions of subjectivities based in consciousness, morals, or for example human sociality, but .. a more radical material relationality and sociability' (Parikka in this issue). In particular, the emerging open hardware community demonstrates the complexities and the potential revolutionary dimensions of 'radical material relationality and sociability'.

P2P production has been able to bring together the otherwise differently developed Free Software Foundation (FSF) and the open source movement, and now the open source hardware creating community. The latter are, for example, committed to OHANDA, which is a database of design repositories allowing collaboration, strictly operating under the GPL and copyleft licensing in hardware production projects (Powell 2011). Collaborative practices give each group of producers a subversive framework for knowledge sharing and a radical space to express subversive identities that reject competitiveness and obsessive individualism. This ecology potentially overthrows, or at least

dramatically challenges, the current dominant model of flexibilised subjectivities which are positioned around capitalist norms. Weber shows that 'authority within a firm and the price mechanism across firms are standard means to efficiently coordinate specialised knowledge in a complex division of labour—but neither is operative in open source' (Weber 2004). Yet without guaranteed wages, what are the incentives for participation and contribution? These key differences noted in participant subjectivities could indeed be the key for overthrowing the capitalist wage relationship. People within the P2P ecologies for production see themselves as autonomous producers, without the pressure of a boss and thus the capitalist employment relationship is removed. Where is the 'boss of it all' in open ecology communities? Indeed, it exists within subjectivities. While workers' knowledge within capitalist companies automatically becomes the intellectual property of employers, the FSF and FLOSS and open hardware ecologies allow a level of personal 'possession' of the product and through this formation of revolutionary subjectivities and thus the self. The recursive commons is born.

Several P2P hardware projects have emerged in recent years. These include the work of Smari McCarthy, Director of Taj Fab Lab in Jalalabad, Afghanistan and native of Iceland, and Xavier Leonard, who run the following projects and Fab Labs:

- Peer escrow identity management system
- Crowdsourced democracy system
- Mutualist monetary system
- Economic information system (CyberSyn inspired)
- Natural resource mapping system
- Arbitrary arbitration protocol
- Peer-to-peer education system
- Distributed Healthcare system
- Executive authority management

Fab Labs and related projects include:

- Vestmannaeyjar Iceland Fab Lab
- FabFi wireless project
- Afghanistan Fab Lab
- Open Manufacturing
- FOME
- Icelandic Society for Digital Freedoms

Other projects include the Manchester FabLabs project initiated by Dr. Eddie Kirkby and others, overseen by the Manufacturing Institute in Manchester. Based within the Chips Building in Manchester's New Islington area, this is the 35th Fab Lab in the world. Haydn Insley acts as Charity Project Manager. As reported by Parley (2010), Julie Madigan who is the Chief Executive of the Manufacturing Institute claims 'this is an opportunity to broaden our innovation base and increase crucial invention skills. It is a proven grass roots approach that will directly benefit the economy and different parts of the community'.

Another example is Paul Hartzog and Sam Rose's involvement in the establishment of another project entitled '21st Century Wealth-generating Ecologies and an Infrastructure for Open Everything' (Hartzog and Rose 2009). Then

there is Dr. Marcin Jakubowski's work as Director for Permaculture and Open Manufacturing, which is the basis for his Factor E Farm Project using peer production methodologies. Factor E Farm is an experiment of putting theory into practice. Dr. Jakubowski and several others have been applying P2P methodologies and codes of practice to their work since the Farm's inception. The aim is to create a 'global village construction set' and these activists are 'refining existing technologies and techniques into simple, easily replicated, open source designs with closed, zero-waste resource cycles' (ibid.). P2P workers in these communities claim to control their own manufacturing and production and see this as a crucial step toward a post-capitalist world. 'By our analysis, most of the technologies needed for a sustainable and pleasant standard of living could be reduced to the cost of scrap metal + labor. There is immense potential for social transformation once this technology is fully developed for building interconnected self-sufficient villages, since people will be freed from material constraints and able to seek self-actualization' (ibid).

Open Source Ecology is another P2P hardware project that calls itself 'a movement dedicated to the collaborative development of the world's first replicable, open source, modern off-grid "global village". By using permaculture and digital fabrication together to provide for basic needs and open source methodology to allow cheap replication of the entire village, we hope to empower anyone who desires to move beyond the struggle for survival and evolve to freedom' (Open Source Ecology 2009).

The Open Ecology peer production collaboration cycle and methodology is the following:

- Feedback throughout
- Fabrication, potentially in distributed locations
- Resource donations
- Quality markup technical drawings
- 3D computer models
- Economic analysis
- Further design
- Worknet workspace as initial development, ending in dedicated wiki webspace
- Technology administrator: for each product (ibid.)

These projects are far more than research and development activities for digital neoliberal capitalism, despite the well documented and at times successful mainstream attempts at subsumption. Within the hardware community, from the nascent stages of design and creation there is a strong commitment to collaboration and the commons. As such, these communities pose a significant challenge to post-Fordist capitalism. They go beyond the limits of preceding free software movements, due to their materiality and their capacity to generate full post-capitalist ecologies. These have a sustainability and fuller embodiment of all dimensions of sociality, beyond the limitations of free software.

Many of the people working in the commons, in both software and hardware production, are dedicated to taking the means of production away from the elite digerati as well as the corporate moguls who are the most recent reactionary examples of Gramsci's organic intellectuals (Gramsci 1971) [2]. This is despite the fact that the idea of the ecology has been integrated at some points into management discourse and cybernetics [3]. However, a real battle has begun between management interpretations of ecologies and those who intend to challenge a managerialist policy that, as stated, is becoming increasingly invasive and biopolitical. A revolution of subjectivity is needed, along the lines we have begun to see in the terms described in this article. This needs to create environments in which people can

labour and live in an interdependent and self-sustaining way, outside of capitalist modes and means of production. Can P2P production values change users' incentives, directing these towards participation in form of production that transcend competition, ownership, and profit seeking?

Towards a Conclusion

The emerging P2P ecology allows us to open a critical perspective on the technological determinism and privileging of technical innovation that now pervades contemporary neoliberal digital capitalism. Indeed, this ecological change within social and technological relations coincides with these contemporary modalities of production, seen in dominant and pervasive enterprise initiatives in every labour sector in the neoliberal era. Can the emergence of P2P participants' battle with capital transform the traditional hierarchies that characterised sites of production typical of the industrial age? The contemporary post-capitalist ecology I have described here does seem to allow workers to arrest their own self-management. They return to a situation wherein people can formulate revolutionary subjectivities and own their labour and means of production, rather than continue to be subordinated to hierarchies and deterministic views of technology and progress. The self-organising communities of peer production threaten the status quo by taking ownership of the means and modes of production. This also involves rethinking ecologies of production, beginning with the structuring of capital output into a commons from which to adopt and adapt, whether personally or communally, through the use of the General Public Licensing model which renders intellectual property obsolete.

Through 'commoning' and through the production of open software and hardware and related alternative protocols, it has become possible to challenge capitalism. Capitalist elites do counter this, cutting through the aesthetic veneer that advances the autonomous affective self (Colman, 2010: 3). Yet the peer production movement, as media ecology, still poses an active, potentially revolutionary challenge to the contemporary post-industrial project of capitalist subsumption.

Endnotes

[1] Neo-Gramscians (Bieler, Cox, Gill, Moore, Morton, Worth, etc.) have given Gramsci's theories an international dimension, and their work provides analyses of how ideas are made concrete and hegemonic, and how they continue to prevent revolution.

[2] Bearing in mind that 'organic' in this sense is not the organic we often think regarding pesticide free, genetically authentic gardens or all-natural foods and so on. Gramsci means that the elite are as capable of planting what might appear to be radical ideas as revolutionaries or subversives are, and have been able to cultivate their own species of intellectuals through forming corporate links and building alliances in ways that fuel capitalism.

[3] Lovink (2004) argues that the Internet and new media have both frightened and excited capitalists: frightened because it is in many ways still unexplored territory and provides a space that is less familiar with copyright and intellectual property restrictions; but also excited about the profit making implications.

Acknowledgements

I would like to thank Alison Powell, Michel Bauwens, Jussi Parikka, Michael Goddard, Smari McCarthy, Matthew Fuller, Athina Karatzogianni and George Dafermos for their generous comments, guidance, and support throughout the writing of this article.

Biographical Note

Phoebe has two interrelated research interests: international labour struggle; and post-capitalist models for socio-political economies that can resolve labour struggle, some of which are found in digital communities. Her recent research monograph entitled *The International Political Economy of Work and Employability* (Palgrave, Aug 2010) examines the effects of global shifts to a knowledge-based economy on people, using comparative studies of policy and the related 'employable' subjectivity and personality ideal types. Previous publications include 'UK Education, Employability, and Everyday Life' (*Journal of Critical Education Policy Studies* (2009) 7(1)); and a co-authored piece with Paul A. Taylor entitled 'Exploitation of the Self in Community-Based Software Production: Workers' Freedoms or Firm Foundations?' *Capital and Class* (2009), 97: 99–120.

References

Amoore, Louise. 'Invisible Subject(s): Work and Workers in the Global Political Economy' in Matt Davies and Magnus Ryner *Poverty and the Production of World Politics: Unprotected Workers in the Global Political Economy*. Palgrave Macmillan 2006: 14 – 37.

Bauwens, Michel. 'The Emergence of Open Design and Open Manufacturing', *We-Magazine 2* (2009), <http://www.we-magazine.net/we-volume-02/the-emergence-of-open-design-and-open-manufacturing/>

Benkler, Yochai. *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. New Haven CT and London: Yale University Press, 2006.

Berardi, Franco 'Bifo'. *Precarious Rhapsody: Semiocapitalism and the pathologies of the post-alpha generation*. London: Minor Compositions, 2009.

Boutang, Yann Moulrier. *Le capitalisme cognitive*. Amsterdam and Paris: Editions, 2008.

Brown, Phillip and Antony Hesketh. *The Mismanagement of Talent: Employability and Jobs in the Knowledge Economy*. Oxford: Oxford University Press, 2004.

Bruff, Ian. 'The Totalisation of Human Social Practice: Open Marxists and Capitalist Social Relations, Foucauldians and Power Relations', *The British Journal of Politics and International Relations* 11. 2009: 332 – 351.

Colman, Felicity J. 'Affective self: feminist thinking and feminist actions', in *Contemporary French and Francophone Studies*: Site 14: 5 . 2010.

Colman, Felicity J. 'Affective Vectors: icons, Guattari, and art', in Simon O'Sullivan and Stephen Zepke (eds). *Producing the New: Deleuze, Guattari and Contemporary Art*, London: Continuum Press, 2008: 68-79.

Colman, Felicity and Christian McCrea 'Gestures towards the Digital Maypole' *The Fibreculture Journal Issue 6* 2005, http://journal.fibreculture.org/issue6/issue6_colman.html

Cox, Alan. 'Cathedrals, Bazaars and the Town Council' *Slashdot* post 13 October 1998, <http://slashdot.org/features/98/10/13/1423253.shtml>

Dahlander, Linus. 'Relationships between open source software companies and communities: Observations from Nordic firms' *Research Policy* 34 2005: 481–493.

De Angelis, Massimo. 'The Production of Commons and the "Explosion" of the Middle Class' 2009, <http://www.taller-commons.com/downloads/angelis.pdf>

De Angelis, Massimo. *The Beginning of History. Value Struggles and Global Capital*. London: Pluto Press, 2007.

Deleuze, Gilles and Felix Guattari. *A Thousand Plateaus* trans. Brian Massumi. Minneapolis: University of Minnesota Press, 1987.

DiBona, Chris, Sam Ockman, and Mark Stone. *Open Sources: Voices from the Open Source Revolution*. Pennsylvania: O'Reilly and Associates Inc., 1999.

Dyer-Witheford, Nick. *Cyber-Marx: Cycles and circuits of struggle in high-technology capitalism*. Illinois: University of Illinois Press, 1999.

Elliot, Margaret S. and Walt Scacchi. 'Free Software Development: Cooperation and Conflict in a Virtual Organisational Culture' in Stefan Koch (ed.), *Free Open Source Software Development*. Hershey, Pennsylvania: Idea Group Publishing, 2004: 152 – 173.

Free Software Foundation, 'Overview of the GNU System' 27th September 2005 <http://www.gnu.org/gnu/gnu-history.html>

Fuller, Matthew. *Media Ecologies: Materialist Energies in Art Technoculture*. Massachusetts: MIT Press, 2005.

Gorz, Andre. *Reclaiming Work: Beyond the Wage-based Society*, Cambridge: Polity Press, 1999.

Gramsci, Antonio. *Selections from the Prison Notebooks*. London: Lawrence & Wishart, 1971.

Guattari, Felix. *The Three Ecologies*. London: Continuum, 2008.

Hardt, Michel and Antonio Negri. *Empire*. Massachusetts: Harvard University Press, 2001 reprint edition.

Hartzog, Paul and Sam Rose. '21st Century Wealth-generating Ecologies and an Infrastructure for Open Eve-

rything,' paper presented at Media Ecologies and Postindustrial Production conference at University of Salford, Manchester, 3rd November 2009.

Hine, Dougal. 'The Future of Unemployment: The Situation' Agit8 09/02/09. <http://agit8.org.uk/?p=307>

Intentional Communities 2010, [http://www.ic.org/Intentional Communities 2010](http://www.ic.org/Intentional%20Communities%202010).

Kelty, Christopher M. *Two Bits: The Cultural Significance of Free Software*. North Carolina: Duke University Press, 2008.

Kelty, Christopher M. 'Geeks, social imaginaries, and recursive publics', *Cultural Anthropology* 20. 2006: 185-214.

Kling, Rob and Suzanne Iacono. 'The Mobilisation of Support for Computerization: The Role of the Computerization Movements' *Social Problems* 35.3 1988: 226-242.

Lawer, Chris. 'Market and Non-market Co-creation' in *The Empty Whitecoat*, 9th April 2009, http://chrislawer.blogs.com/chris_lawer/2009/04/market-and-nonmarket-cocreation.html

Lazzarato, Maurizio. 'Immaterial Labour' in Paolo Virno and Michael Hardt (eds). *Radical Thought in Italy: A Potential Politics*. Minneapolis: University of Minnesota, 1996, 133 - 150.

Lovink, Geert. *Uncanny Networks: Dialogues with the Virtual Intelligentsia*. Cambridge, Massachusetts: The MIT Press, 2004.

McRobbie, Angela. *The Aftermath of Feminism: Gender, Culture, and Social Change*. London: Sage, 2009.

McRobbie, Angela. 'From Holloway to Hollywood? Happiness at Work in the New Cultural Economy', in Paul Du Gay and Michael Pryke (eds). *Cultural Economy*, London: Sage, 2002, 97 - 114.

Moglen, Eben. 'Freeing the Mind: Free Software and the Death of Proprietary Culture.' Keynote address at the University of Maine Law School's Fourth Annual Technology and Law Conference, Portland, Maine (June 29, 2003), <http://old.law.columbia.edu/publications/maine-speech.html>

Moore, Phoebe. *An International Political Economy of Work and Employability*. Basingstoke: Palgrave Macmillan, 2010.

Moore, Phoebe. *Globalisation and Labour Struggle in Asia: A Neo-Gramscian Critique of South Korea's Political Economy*. London: I.B. Tauris, 2007.

Moore, Phoebe and Paul A. Taylor 'Exploitation of the Self in Community-based Software Production - Workers' Freedoms or Firm Foundations?' *Capital and Class* 97 2009: 99 - 120.

Open Source Ecology. http://openfarmtech.org/index.php?title=Main_Page

P2P Foundation, 'Open Source Ecology'. http://p2pfoundation.net/Open_Source_Ecology

Parley, Martin. 'FABricating freedom - UK's first Fab Lab', *ParleyMaterialsWorld Magazine*, 01 Jun 2009 <http://www.iom3.org/news/fabricating-freedom-uks-first-fab-lab-opens-manchester>

Pedagogy for Employability Group. Higher Education Academy/Enhancing Student Employability Coordination Team (ESECT) (2006).

Powell, Alison. 'Wifi Publics: Producing community and technology,' *Information, Communication and Society* 11:8 (2008), 1068 – 1088.

Powell, Alison. 'Challenge and Recuperation: Codifying Open-source Knowledge Flows in Software and Hardware' (presented at Media, Communications and Cultural Studies Association [MeCCSA] conference 12-14 January 2011, hosted by University of Salford at the Lowry Theatre. Now under review for *Communications Review* in March 2011).

Tomer, John F. *The Human Firm: A Socio-Economic Analysis of Its Behaviour & Potential in a New Economic Age* London: Routledge, 1999.

Turner-Rahman, Greg. 'Sharing Styles: New Media, Creative Communities and the Evidence of an Open Source Design Movement', *The Fibreculture Journal, Distributed Aesthetics Issue*, 7. 2005.

Virno, Paolo. *A Grammar of the Multitude*. Semiotext(e), 2002.

Weber, Steven. *The Success of Open Source*. Massachusetts: Harvard University Press, 2004.

Zawinski, Jamie. 'Resignation and Postmortem' 1999, <http://www.jwz.org/gruntle/nomo.html>



The LOCKSS System has the permission to collect, preserve and serve this open access Archival Unit



The Fibreculture Journal is published under a Creative Commons, By Attribution-Non Commercial-No Derivative licence.



OPEN HUMANITIES PRESS

The Fibreculture Journal is an Open Humanities Press Journal.