

### 3 Laboring lives: genomic stuff

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Nowadays, the capacities of the fragmented body have been turned into instruments for production, redefining labor and agency. Not only do all kinds of agents and instruments labor *on* life, through the political economy of life itself, life itself *does* all kinds of labor. One example, I suggest, is genomic labor, involving the production of biosocial value which is material and informatic at the same time, both natural and social. This chapter extends the notion of relations of production beyond “natural” resources in the classical sense to the extraction, reproduction, and exchange of bodily material and information, to *biosocial* relations of production. While it may be argued, in a late-Foucauldian fashion, that the users of the genomics services discussed in the previous chapter perform labor *on themselves*, seeking to know themselves and to care for their bodies, their labor also needs to be situated in the biomedical mode of production involved. Addressing the realities of life itself in late-modern times in terms of labor processes and relations of production helps to characterize the different arrangements involved in the production and circulation of biosocial value.

Classic theories of political economy developed by Adam Smith, David Ricardo, Karl Marx, and many others assumed a laborer developing and applying his or her skills *in situ*, typically in an agricultural field or an industrial factory. For them, labor activities took place in the home or a nearby field or factory, in a local community embedded in a larger political economy. There have been exceptions, of course, throughout human history, with partial or temporary separations of the site of labor activities and the site of home. Nevertheless, in agrarian and industrial discourse the sites of labor and home have tended to be more or less permanently collapsed, a single life world or habitat.

In recent years, however, the spatial relations of labor activities have been radically changed as a result of complex and interrelated developments, including the growth of the World Wide Web, the network society (Hardt and Negri 2000), and virtual migration (Aneesh 2006); “paradoxically,” Aneesh (2006: 2) notes, “the new space of transnational labour has reversed its relationship with the worker’s body. Rather than move the body across

enormous distances, new mechanisms allow it to stay put while moving vast quantities of data at the speed of light.” Call centers of the kind studied by Aneesh underline the ability to perform work at a place other than the site of the acting body. What travels here is not the worker, but her voice and presence, in its digitalized form of bytes and megabytes.

Not only have the sites of labor and production increasingly been separated, the capacities of the body have been fragmented and turned into instruments for production, redefining both human labor and human bodies. Thus, the famous HeLa cell line taken from Henrietta Lacks who died from cancer in 1951 are reproduced on a global scale for a variety of purposes independent of the original host (see Landecker 2007). “Pluripotent” stem cells, endowed with the capacity to generate a variety of body tissue, represent another example. The “same” body, then, in a sense, performs labor at two or more sites simultaneously. Not surprisingly, these complex tournaments of bio-social value pose intriguing questions about biopolitics, place, and agency. A broadened notion of *biosocial value* is essential, I suggest, for understanding the coproduction of the hybrid complex of genomic material and information. Thus, the users of personal genomics services often contribute both a biological sample (a swap or a spit) and a variety of information on background and lifestyle. How do people become implicated in new labor processes as they subscribe to personal genomics services?

The companies involved in personal genomics have tended to emphasize consumers’ access to medical knowledge and their relative independence of the medical establishment; hence, the claim on the deCODEme website: “[W]e wanted not only to empower the public, but also to give students, academics, physicians and other professions with an interest in genetics a chance to get a more in-depth view of their code and genome” (deCODEme 2009). Indeed, users draw their own conclusions and engage in dialogues with genomic experts, sometimes becoming experts themselves in the process. In a sense, then, this is science from below (Harding 2008). One example is SNPedia. Drawing upon summaries of peer-reviewed articles presumed to be relevant for given genomic data, it allows users of different testing services to pool personal data, to learn more about their own genotypes, and to explore the effects of variations in DNA. The consumption of personal genome data, as Prainsack (2011) points out, is also sold as an experience. Indeed, for me submitting samples, browsing the websites, downloading the results, and discussing them with family and colleagues was both an experience and an opportunity to look at potentially relevant medical information that my family doctor was unlikely to have access to. Interestingly, when I presented my results to my family doctor she appeared not to know of the deCODEme service. This is not, however, the end of the story. As we will see, one should not be too easily seduced

by the rhetoric of democracy and of care of the self. It is important to draw attention to the laboring consumer.

Broadening the feminist perspective of Dickenson (2007) and some others, I suggest that the labor carried out by *both* men and women when subscribing to personal genomics services largely goes unrecognized. Also, this labor is both material and “immaterial,” contributing personal information regarding lifestyle, diet, and so on as well as DNA material. Moreover, in contrast to the neoliberal “body shopping” represented by nannies and cleaners who physically move to the site where they are needed (Freeman 2011), the providers of genomic material and information are virtual migrants, in Aneesh’s (2006) sense, at someone’s service, contributing to transnational biobanks and databases that can be operated from anywhere anytime through the aid of the Internet and computing machinery.

Prior to the development of biotechnology and assisted reproduction, there was no place for human body parts in the Marxian scheme of the labor process although Marx did have something to say about *whole* bodies, estranged workers and slaves in particular. Thus, Marx refers to “nature” as “inorganic body; that is to say nature, *excluding the human body itself*” (1959: 126–127; emphasis added). Given Marx’s framework, the dual identity of the human body as a laboring phenomenon *and* as an object of laboring activities is a contradiction in terms. While the extension of human mastery to the body itself complicates the Marxian scheme, it also invites intriguing questions about labor, production, and ethics. As Dickenson (2007: 29) emphasizes, “modern biotechnology muddies the clear distinction between things external to our bodily selves and those intrinsic to us . . . . The notion of ‘external’ is problematized and problematic in modern bioethics and biolaw, and with that come difficulties that Marx did not have to confront about what is alienable and what is inalienable from the subject.”

Engels, however, suggested that one might think of the body itself as the product of labor. Drawing upon an evolutionary perspective, he argued that “in a sense, we have to say that labour created man himself” (Engels 2007: 25). “[T]he hand,” he went on, “is not only the organ of labor, it is also the product of labor” (Engels 2007: 26). The modern world of biomedicine has made Engels’s man-makes-himself perspective more pertinent than he could have imagined. Thanks to their labor activities, humans are now able to reproduce their own bodies, as part of the “inorganic body” of “nature.” Not only do modern bioindustries produce a variety of “biologicals,” agents extracted from or generated by biological material, these biologicals perform their own labor. Stem cells, for instance, are increasingly cultivated outside the human body, producing organs as “spare parts” for humans. Clearly, with modern biotechnology the “natural” capacities of the body have been turned into instruments for production, redefining both human labor and human bodies.

### 3.1 Producing bodies

Marxian theory is very much an agrarian discourse extended to industrial, capitalist production. Underlining human dependence on the environment (usually the land) through the production process, Marx (1959: 275) suggested that nature and humans formed a single “body”: “The life of the species, both in man and in animals, consists physically in the fact that man (like the animal) lives on inorganic nature; and the more universal man (or the animal) is, the more universal is the sphere of inorganic nature on which he lives.” In Marx’s view, during the period of agriculture the land was “still recognized as a phenomenon of nature independent of man – not yet as capital, i.e., as an aspect of labor itself. Nature appears rather as an aspect of the land” (Marx 1959: 292). With the introduction of capitalism, nature was redefined as the expanding space for alienated labor, as an “aspect of labor itself.” As Schmidt (1973: 82) puts it in *The Concept of Nature in Marx*, in agricultural production nature is “absolutely independent of men, men are abstractly identical with nature. They lapse, so to speak, into natural existence. However, where men succeed in universally mastering nature technically, economically and scientifically by transforming it into a world of machines, nature congeals into an abstract in-itself external to men.”

Marx and several other commentators on the British “Factory system” discussed the key changes introduced by the mechanization of Victorian industries by means of prosthetic metaphors, in terms of relations between parts and wholes, organs and machines. In large-scale industrial production, Marx emphasized in *Capital*, each person was “bound hand and foot for life to a single specialized operation,” a labor process that converted the worker into “a living appendage of the machine” (1976: 614). While responses varied – some being paranoid and others enthusiastic – different commentators addressed fundamental questions about identities, priorities, and hierarchies: “As prostheses are grafted upon yet other prostheses, which entity takes the role of attachment and which of host? In these hybrid couplings, what is actually a part of what?” (Ketabgian 1996: 13). What happens, then, when human mastery is turned inwards, extended to the bodies of the laborers themselves? Do they, perhaps, “lapse” once again into natural existence?

When discussing the production and reproduction of body parts, it is essential, of course, to pay attention to differences in the material in question. The “candidacy,” in Appadurai’s (1986) sense, of genes, cells, tissue, organs, and embryos for extraction, reproduction, commodification, and exchange is highly variable – depending on material properties, technologies of extraction, storage facilities, reproductive opportunities, and the cultural framing of human bodies – although candidacy has been extended to practically anything living. As a result, body parts bring “donors” and “targets” – persons and

laboratories, people and markets, agencies and consumers – into different kinds of relations that ethnographers and theoreticians are busily exploring these days. Brief examples will have to suffice in this context. The general point to make is that extending the notion of relations of production to body parts – to the extraction, reproduction, and exchange of bodily material – may help to characterize the different arrangements involved in the production of biocapital, with their practices of ownership, relations of hierarchy, subjectivities, and sense of personhood and identity.

Human blood, to take one example, is routinely assembled and banked, for a variety of practical purposes, usually on a voluntary basis, within the framework of the gift. The Maussian gift, as Dickenson (2007: 21) puts it, “is still in a sense alive – far more so than even [Mauss] . . . might have realised, in the case of biological tissue” (see also Schneider 2003). Some human biological gifts are considered waste; human tissue samples are habitually extracted at hospitals for diagnostic testing and for material documentation of surgery. “Donors” are usually understood to have freely relinquished their samples, with or without informed consent, on the assumption that such tissue is of no practical use. New theoretical frameworks and advancing technology, however, may turn such “trivia” into gold mines.

Most extracted human biological material is neither waste nor a gift. Human reproductive material, in particular, is usually highly controversial, involving contested concepts, schemes, and relations. Thompson (2005: 248) suggests that a move beyond production characterizes reproduction centered on the human embryo, a mode of reproduction that “has its own characteristic systems of exchange and value, notions of the life course, epistemic norms, hegemonic political forms, security, and hierarchies and definitions of commodities and personhood.” The practice of “surrogate” motherhood has received a fair amount of attention in both the media and academic works, partly because of the complications it invites for legal definitions of parentage and motherhood. To underline the human labor and biosocial relations involved, Dickenson (2007: 54) applies the notion of “biological lumpenproletariat” (originally coined by Dorothy Nelkin in another context) to women who rent out their wombs.

While in a sense sperm and ova, the key resources for assisted reproduction, represent identical components, each of them contributing essential genetic material, in practice they seem to represent radically different regimes of bodily commodification. For instance, a study of egg agencies and sperm banks in the United States shows how “the dynamic interplay between biological, economic, cultural, and structural factors differentiates the market in egg from that in sperm in each stage of the donation process” (Almeling 2007: 336). In particular, different contracts are applied to egg and sperm donations with different kinds of rewards and etiquettes and different concerns for

privacy. Overall, there is a mounting demand for human ova in biomedicine. This is due to both the growth in assisted reproduction in many contexts and the escalating demand for ova in the rapidly advancing stem cell industry. Thus, Hwang Woo Suk is reported to have used no fewer than 2,200 eggs from 129 women for his infamous stem cells project (see Gottweis and Triendl 2006). The shortage of ova is exacerbated by the fact that harvesting requires invasive surgery. Women's contributions not only invite a series of complications, including the risk of ovarian hyperstimulation syndrome, they are labor-intensive, productive work, not "merely" reproductive labor. As Dickenson (2007: 68) argues, battling with the patriarchal position of Marx who tended to treat women's domestic work as purely natural, not social, following an ancient, philosophical tradition, "it takes a great deal of intentionality and control to undergo the threefold processes of ova donation; of course it is labour, and hard labour at that. Women have a genuine Lockean property in the labour of ova extraction."

The market for human body parts is increasingly a global one. Both so-called reproductive tourism and international trafficking in organs point to a North-South division of labor, the people in the Global South generally offering cheap sources for the rest – as biological lumpenproletariat. Gibbon and Novas (2007: 13) argue that a "pressing issue for sociological and anthropological analysis is whose bodies are open to genetic and molecular remedies," pointing out that in some contexts (in India, for example) there is "great disparity over the social position of those whose bodies' embryos, cells and tissue are extracted, in contrast to the persons into whom they are inserted." Clearly, the North-South division underlines particular kinds of biosocial relations of production.

The human body, it needs to be emphasized, is not only being refashioned through the fragmenting, reshuffling, and hierarchies that characterize biosocial relations of production. Taking a broader perspective, it is also the object of a rapidly expanding production system – a global body shop, if you like – involving the manufacture and marketing of drugs and food products, including genetically modified food. Here, perhaps, Marx's later works on the "structures of capital" might be more relevant than his early works on alienation and estrangement. Increasingly, the activities of multinational corporations affect the *environment* from which human bodies receive their energy and nourishment no less than their internal constitution. What Marx would refer to as "man's metabolism with nature" is saturated by biopower of one form or another. This is one aspect of the New Economy of Late Capitalism (Fisher and Downey 2006).

The preceding discussion indicates that the trafficking in body parts is highly gendered, women's business. The tide, however, is turning. Dickenson (2007: 32) reasons that with the "new enclosures" of the human body as a

result of advances in biotechnology “some aspects of objectification which were previously limited to women’s historical experience are now being extended to biologically male bodies as well.” Perhaps this is why there is renewed interest in early-Marxian notions of alienation and estrangement. The prospects of objectification concern everyone.

### 3.2 The organic and the inorganic

In the process of requesting and using personal genomics services, consumers facilitate, either directly or indirectly, the construction of gigantic DNA assemblies, coproducing knowledge of genomic differences. The spokespersons for 23andMe, unlike those of most of the other projects, were quite open about the issue of alternative uses of their data – for example, research. Wojcicki suggested that signing up for 23andMe was “a great way for individuals to be involved in the research world . . . You’ll have a profile, and something almost like a ribbon marking participation in these different research papers. It will be like, How many *Nature* articles have you been part of?” (Goetz 2007). This is highlighted in a comment on one of the websites: “If the company succeeds in attracting the hundreds of thousands of customers Avey and Wojcicki talk about drawing, it will be sitting on one of the largest genetic databases on Earth. And there’s no opting out of any research studies 23andMe wants to conduct at that point, either, since the consent forms to which customers must agree specifically commit their genome-scan results to future research” (Hamilton 2007). Arguably, the people contributing cheek swabs to personal genomics services are engaging in co-working, a collective labor process that ultimately results in large-scale biobanking. Spitting saliva and providing cheek swabs, after all, is biosocial work, potentially contributing to the global networks and hierarchies involved in the manufacture of biosocial value.

deCODEme was part and parcel of its mother company deCODE genetics, whose purpose is to advance biomedical research and pharmaceutical development. Although the company seems to have no plans to directly draw upon its personal genomics data in its biomedical research, a closer integration might take place later on. There are also strong financial and technical links between 23andMe and the giant Google which may be indicative of new, hybrid forms of biobanking and bioinformatics. Whatever their current ambitions, personal genomics projects are likely to connect with larger biomedical projects in the future. Given the possibility of hacking genomic data (Aldhous and Reilly 2009), the clients of personal genomics companies may eventually be contributing to projects beyond the awareness and control of the services they have contracted.

Perhaps the social network of Facebook helps to illuminate the issue of labor and co-working in the context of personal genomics. Here, users’ expressions



of “likes” with respect to particular retailers or services are routinely translated into advertisements, as a result of which Facebook collects profits from retailers’ payments. How could users’ work be acknowledged? A lawsuit filed in California in 2011 (ANGEL FRALEY, et al. Plaintiffs, v. FACEBOOK, INC., Defendant) provides some clues. The plaintiffs argued that Facebook users were not sufficiently informed of how their “likes” translated into profits. In response, Facebook proposed a settlement which would involve informing users about sponsored stories and a payment of \$10 million to research and advocacy groups that work on digital privacy rights. A federal judge in California, however, rejected Facebook’s settlement offer, requesting clarification on what would count as adequate and fair in such calculations and suggesting that lawyers might have “bargained away something of value” (United States District Court for the Northern District of California San Francisco 2012). Presumably the judge was referring to the co-working of users.

Hardt and Negri (2000: 30) emphasize the vital dimensions of biopolitics, focusing on the production and reproduction of life itself; for them, it would be misleading “to treat the new labouring practices in biopolitical society *only* in their intellectual and incorporeal aspects. The productivity of bodies and the value of affect . . . are absolutely central in this context.” Perhaps it is necessary to react to the informatic, textual trend associated with the mapping of genomes and the “code of life.” Indeed, life itself – in the form of stem cells, tissue, and organs – is a central component in the production of biovalue. Often, however, it is difficult to maintain a rigid distinction between the corporeal and the incorporeal.

This is particularly relevant for current gene discourse. As Keller (2000) famously argued, the concept of gene is highly unstable, and varies from one discipline to another. For Rheinberger (2000b: 221), similarly, the gene belongs to a class of fuzzy “objects” that cannot be assigned a precise meaning; in his view, the usefulness of boundary objects does not rest with a clear definition from the outset: “[I]ndeed it can be rather counterproductive, to try to sharpen the conceptual boundaries of vaguely bounded research objects while in operation.” Keeping in mind the fact that the genome is sometimes regarded as informatic assembly and sometimes as a material thing, it seems to make sense, in order to avoid unnecessary ambiguity, to simply speak of “genomic stuff” (Palsson and Prainsack 2011); in other words, leaving aside the issue of materiality versus meaning. The notion of “biovalue,” then, seems too restrictive when dealing with genomic stuff. It is easy, perhaps, to dismiss the notion of “stuff” in this context as it is often used in a pejorative sense to designate relatively worthless material or immaterial things, much like the notion of “junk.” However, “stuff” is sometimes used with a very different meaning, conveying a heightened sense of vital importance. Thus, the



Middle-English term “stuffe,” from which it is drawn, referred to both a person’s essential moveable household property and the weapons and food necessary for battle (Harris 2011: 162).

To capture the complex implications of personal genomics services it seems pertinent to draw upon the notions of biosocial value and ensembles of biosocial relations. Users of these services are often contributing both tissue and information on phenotypic characteristics, health, drug use, and lifestyle – information that in the future will probably be updated interactively to increase the efficiency of the machinery of schemes such as deCODEme and 23andMe.

Prainsack (2011) suggests that if we are witnessing a “participatory turn” in genomics we need to ask what it involves. She makes a distinction between “early adopters” and “regular consumers” of personal genomics services, to highlight their different motivation and work. While early adopters may play a significant role in shaping the project, regular consumers are likely to be rather mute or passive. Contributors to genomic services and biobanks are not only doing work in the sense that they provide genomic stuff of critical importance; also they are engaged in the coproduction of biosocial networks. This is an issue highlighted in several recent works (see, for example, Thacker 2005, Levina 2010). Drawing upon her work on 23andMe, Levina (2010: 2) suggests that “life in the network society requires of its denizens a constant contribution to the growth of the network . . . Members are encouraged to think of themselves as dividuals, or nodes, in the network.” If network subjectivity, she continues, “is conceived in terms of dividual bodies and identities, then each body – reduced to its information – can be abstracted from its social and cultural context. It becomes, in a sense, a free-floating signifier” (Levina 2010: 7). Such a perspective seems to resonate nicely with the notion of humans as ensembles of biosocial relations.

### 3.3 Conclusions

No doubt, personal genomics of the kind discussed here involve an element of empowerment. Some qualifications, however, are needed. Prainsack *et al.* (2008) argue that while relaxing the genetic protectionism rampant in recent decades may be a good thing, giving people an opportunity to become active governors of their genomes, the arguments about individual freedom, informed choices, and the unregulated genomic marketplace should be taken with a grain of salt. For one thing, they disguise the fact “that personal genomics is pushing the individualization of responsibilities one step further” (Prainsack *et al.* 2008: 34). Anthropology and related fields can play an important role on this front by exploring what such individualization means and what people expect from genomics, providing “thick” descriptions (see, for instance, Santos *et al.* 2009).

Another qualification relating to the agency of the users of genomics services is also essential; this concerns the labor they perform *for* personal genomics services rather than their opportunity to comment, interpret, and engage in a dialogue on methods and results. Historically, the discourse on labor, property rights, and “resource” governance has described the characteristics of the regimes in question in terms of rather simple binary dimensions: stationary versus mobile, aquatic versus terrestrial, biological versus physical, material versus intellectual. Along with some other body issues, including surrogate motherhood, organ transfer, and biobanking (Dickenson 2007, Gottweis and Peterson 2008), genomic stuff seems to invite new dimensions and considerations. For one thing, with the new genetics, the development of biomedicine, and the expanding production of biocapital (Palsson 2007, Lock and Nguyen 2010), the very notion of the “biological world” has been destabilized as nature is increasingly subject to artificial, human refashioning.

Personal genomics, as we have seen, represents a series of developments in genomics, biomedicine, informatics, and neoliberal economies. Rooted in the personalized medicine characteristic for population biobanks founded during the past decade or so, aiming to produce medicine geared to individual genomes, it is now firmly embedded in network society. In some respects, the focus on labor in this context may be narrow and restrictive, economizing complex and diverse developments. Consumers, after all, seem to get some rewards, in terms of belonging and sociality, indulging in play and recreation. Also, one may argue, there is a crucial difference between reproductive and genomic laborers in that the former, unlike the latter, take serious health risks with considerable emotional and physical involvement.

Consumers of such services, however, I have argued, are not simply passive recipients of goods; they are actively co-working, contributing labor from different virtual sites at a variety of scales and hierarchies with different forms of alienation and exploitation. These biosocial relations need to be mapped in detail in comparative contexts, partly for their own sake to better understand the scene and partly with respect to policy and governance. Following Toffler who launched the notion of prosumption, Ritzer and Jurgenson (2010: 17) suggest that social theorists of production and consumption (for example, Marx and Baudrillard) have too strongly distinguished between these two spheres, suffering from either a productivist or a consumptionist bias. While “prosumer society,” they argue, is nothing new, “a series of recent social changes, especially those associated with the internet and Web 2.0 (briefly, the user-generated web, e.g. Facebook, YouTube, Twitter), have given it . . . greater centrality” (Ritzer and Jurgenson 2010: 14).

There is a vast terrain to explore in personal genomics and related fields, it seems, through the analytical lens of labor. The contribution of the “consumer” is negated twice, rhetorically and financially, in the fact that the consumer

*pays for* contributing and *has no share* in the profits derived from patents claims and other potentially collective products of personal genomics. Recognizing the roles and complexities of co-working and the immaterial labor involved, in the communal spirit of solidarity that increasingly characterizes bioethical discussions (Prainsack and Buyx 2012), it seems likely that new forms of management and public engagement will be explored for personal genomics. Perhaps in the near future governmental and non-governmental agencies along with private companies and users' organizations will experiment with some forms of DNA co-operatives, moving not only from *me* medicine to *we* medicine, to paraphrase Dickenson (2013), but also, to draw upon the fashion of naming in the industry, from LaboringMe to LaboringUs.

For Marx, a series of concepts served to underline the worker's loss of control and self under the labor conditions of capitalism: estrangement, embodiment, and externalization (*Entfremdung*, *Verkörperung*, and *Entäusserung*, in German). Given the relations of production involved, the terms of trade associated with private ownership of the means of production, the worker's labor appears as something external to him- or herself, as belonging to someone else: "[T]he external character of labour for the worker appears in the fact that it is not his own, but someone's else's, that it does not belong to him, that in it he belongs, not to himself, but to another" (Marx 1959: 274). The external character of labor and the loss of self imply that the end products of laboring activities, the goods embodying a part of the worker, are separated from the person: "The *alienation* of the worker in his product means not only that his labour becomes an object, an *external* existence, but that it exists *outside him*, independently, as something alien to him, and that it becomes a power on its own confronting him" (Marx 1959: 272; emphasis in the original). Rather than affirming themselves in their work, Marx suggested, workers *deny* themselves, undermining their integrity, agency, and personhood. Human labor, in other words, is being reduced to an "inorganic" condition, much like the labor of the "natural beings" of the agrarian project, including slaves and cattle, usually regarded as appendages of the earth.

To fully understand the implications of the Marxian concept of estrangement and its relevance for the analysis of the current fragmenting and realignment of bodies, it is pertinent to attend to the idea of species-being. For Marx, each species has its own species-being manifested through its engagement with the environment, reflexivity being the key character of *homo sapiens*: "The whole character of a species – its species-character – is contained in the character of its life activity; and free, conscious activity is man's species-character. Life itself appears only as a *means to life*" (Marx 1959: 276; emphasis in the original). One of the key paragraphs in the *Economic and Philosophical Manuscripts of 1844*, which is worth quoting

at some length, elaborates on the idea of “character” by underlining Marx’s pragmatist take on human consciousness and its firm grounding in the “life-activity” of the real world:

It is just in his work upon the objective world . . . that man really proves himself to be a *species-being*. This production is his active species-life. Through this production, nature appears as *his* work and his reality. The object of labour is, therefore, the *objectification of man’s species-life*; for he duplicates himself not only, as in consciousness, intellectually, but also actively, in reality, and therefore he sees himself in a world that he has created. (Marx 1959: 277; emphasis in the original)

Emphasizing the species boundary and the uniqueness of *Homo sapiens*, Marx’s anthropocentrism is rather problematic; modern readers are unlikely to restrict agency to humans the way Marx did. For Marx, however, the contrast with non-human animals was useful in hammering home the central point about estrangement and the associated reshuffling of nature and society under particular conditions of production. “In tearing away from man the object of his production,” therefore, Marx (1959: 277) went on, “estranged labour tears from him his species-life, his real objectivity as a member of the species, and transforms his advantage over animals into the disadvantage that his inorganic body, nature, is taken away from him.” It is precisely here, as several authors have pointed out, that early Marx becomes particularly pertinent for analyses of the condition of the biosocial. The estrangements represented by the biotech mode of production – the fragmenting, trafficking, and hybridity of body parts and the biosocial relations in which they are embedded – mirror, up to a point, the objectification and alienation of “species-life” addressed by Marx. As Thacker (2005: 40) puts it, “Marx’s species being is transformed into a ‘molecular species being,’ a species being in which labor power is cellular, enzymatic, and genetic.”

The alienation of persons from their body parts takes many forms, depending on a host of factors. The *bio-graphies* of fragmented bodies, in the literal sense, their life-courses, unfold through the agency of a series of actors and actants, in the Latourian sense, who both constitute and are constituted by particular biosocial relations of production. Thacker (2005: 308) suggests that fields such as tissue engineering offer “the prime context in which to investigate the extent to which our own bodies – as biologically constituted – are deployed as actants . . . The tissues are my own, yet they exist outside of and separate from my body.” As Lock (2007: 225) has shown through her ethnographic work on organ donation, “organs very often represent much more than mere biological body parts; the life with which they are animated is experienced by recipients as personified, an agency that manifests itself in some surprising ways and profoundly influences subjectivity.”

It may be tempting to read Marx as an essentialist, assuming preformed character for each species and every organism along the lines of current gene-centrism. While the notion of species-being clearly introduces some kind of biology into political economy, it is a relational notion emphasizing the coproduction of the organism and its “inorganic body,” the environment. Marxian theory on this score, therefore, can easily be reconciled with theories underlining mutual interactions in the constitution of life.