

# 1 Introduction

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“Incidentally,” Paul Rabinow (1996: 99) remarked in his *Essays on the Anthropology of Reason*, “there is no entry for ‘life’ in *Keywords*.” He was referring to the first edition of Raymond Williams’s heavily cited reference work, first published in 1976. “Life,” in other words, wasn’t of significance in late twentieth-century discourse. How could that possibly be the case? The “omission,” if that is the right term, in a work that has proved to be a valuable guide to modern thought, at least Euro-American discourse, is remarkable. Could it be that “life” had not yet emerged as an epistemic object? In a sense, the fascination with *some* concept of life is cross-cultural and panhuman, dating back to early myths at the dawn of humanity. And, after all, the European Enlightenment sparked immense interest in “life,” “nature,” and related themes. A whole army of Enlightenment naturalists explored and theorized the history of the planet, the evolution of organisms, and different forms of life (see, for instance, Rudwick 2014). Life was intensively scrutinized through the modernist gaze of “disciplines,” each with its own intellectual terrain, its schools, chairs, and disciples.

If the Enlightenment marked the birth of biophilia (literally, “the love of life”), the *absence* of “life” from Williams’s *Keywords* signified its death, a mysterious disappearance. Originally used, it seems, by Eric Fromm in the early 1960s (Kahn 2011: 11–26), the term “biophilia” has been developed by several scholars for related purposes. During the last century, especially the second half, a new surge of interest in “life” developed. Schrödinger’s book *What Is Life?*, originally published in 1944 (Schrödinger 2006), launched a wave of inquiries into “life itself” in the natural sciences, the humanities, and the social sciences (see, for instance, Jonas 2001 and Dupré 2012). This has generated new kinds of concerns and new epistemic spaces (Canguilhem 2008, Rheinberger 2010). Popular culture, too, is saturated with references to life. John Lennon wrote that when he went to school he was once asked what he wanted to be when he grew up. “Happy,” he wrote down. His teachers told him he didn’t understand the assignment, but Lennon told them they didn’t understand life. It seems safe to say that life has recaptured the imagination of the public, environmentalists, and academics across the disciplinary terrain.

Anthropology (following Kohn 2007, Kirksey and Helmreich 2010, and some others) can usefully be expanded and redefined as the study of more than one species, as the “anthropology of life”: “to encourage the practice of a kind of anthropology that situates all-too-human worlds within a larger series of processes and relationships that exceed the human” (Kohn 2007: 6). In this perspective, the study of humans is inseparable from the study of other organisms. Many ethnographies already support such an argument, giving voice to those who reject categorical distinctions between humans and other beings that characterize modernist discourse. I take the reference to “anthropologies of life,” in the *plural*, to mean several things, including multi-species ethnography, comparisons of ethnobiologies (the endless variety of folk accounts of species differences and relations), anthropological inquiries into “life itself” (sometimes redefining and refashioning *bios* as we know it), and the ways in which anthropologists “dissolve” the human into “life,” biological and social. While “social life” and “life itself” were separated by Enlightenment thinkers, they now seem to be recombined under the banner of the “biosocial turn” in several fields (Meloni 2014), including anthropology.

This introduction outlines broad trends of anthropologies of life, the theoretical and empirical terrain covered by the book, some of the literature it draws upon, the key concepts developed, and the themes connecting different chapters. All of the chapters address some aspect of life – problematizing “life itself,” documenting and reflecting on human entanglements and the changing human condition, while engaging with the complexities of genomes, bodies, and biospheres. To facilitate understanding of such a broad terrain, I suggest a general theoretical perspective that centers on biosocial relations. In the plural, however, anthropologies of life are not restricted to multiple ethnobiologies, the endless variety of folk accounts of species differences and relations. Also, and more importantly, the term may be taken as inquiries into life itself, the processes and metaphors through which people distinguish (or refuse to distinguish) between life and non-life, sometimes redefining and refashioning *bios* as we know it.

### 1.1 What, then, is life?

On the microcosmic scale, with the new genetics and associated advances in bioinformatics and engineering, life has become increasingly unstable. Interestingly, as Keller (2003) points out, as biology has become Big Science, escalating the study of life itself on an unprecedented scale, it also has *dissolved* the essence of life, partly through “synthetic biology,” the “making” of life from chemical building blocks. With the upgrading of the life sciences to Big Science, then, life has become both a focus of attention and a foggy terrain. Schrödinger’s question “what is life?,” as a result, has become more

tricky and pressing. Or is it beside the point? For many scholars, as Dupré and O'Malley suggest, the border case of viruses highlights the fuzziness of life (see Dupré 2012: 208). While viruses are capable of entering cells and moving DNA from one organism to another, they can neither metabolize in the usual sense nor can they reproduce themselves autonomously. No doubt, the exact definition of life will remain elusive and contested, frustrating taxonomic enthusiasts, even more so than in the past. At the planetary scale, the rhetoric of the "Anthropocene" has rendered humans as a geological force, capable of leaving a massive and lasting imprint on the biosphere of the planet. Perhaps in the future we will speak of "synthetic geology."

The gene talk of the second half of the last century – in the wake of the discovery of the double helix and the mapping of the human genome – reinforced the idea of life as a biological given, as a platform on which social life was established and played out. The successes of the new genetics and the idea of the "secret" or "blueprint" of life both delayed genuine biosocial syntheses and silenced critique of the notion of the biological given. Ingold (2011: 3) suggests that generations of theorists "have been at pains to expunge life from their accounts, or to treat it as merely consequential, the derivative and fragmentary output of patterns, codes, structures or systems, variously defined as genetic or cultural, natural or social." His own work for the past quarter of a century, he suggests, has been driven by an ambition to reverse this emphasis, to "restore anthropology to life," through several avenues, including the phenomenological notion of dwelling and the idea that life is lived along lines.

It is one thing, perhaps, to bring *anthropology* to life, moving beyond codes and scripts, and quite another to bring *life* to anthropology, to think comparatively about life and its diverse manifestations and conceptions (Pitrou 2014). Drawing upon the "biopolitical" works of Foucault, many scholars have usefully directed critical attention to the life sciences, in particular the radical refashioning of living matter and its broad impact on social life. As Fassin (2009: 46) has pointed out, however, in Foucault's biopolitics "'life' remains largely elusive." For "the lived" – "life which is lived through a body (not only through cells) and as a society (not only as species)" – Fassin (2009: 48) proposes the label "life as such," to avoid a narrow focus on "biological" phenomena. Lemke (2014: 8, 11) seeks to qualify Fassin's analysis of Foucault's understanding of life, arguing that in some of his last works on the "government of things" Foucault goes beyond the dualistic and anthropocentric limitations of his social-constructivist works on biopolitics. For the post-human Foucault, "the milieu articulates the link between the natural and the artificial without systematically distinguishing between them"; "the biological can only play out in a certain 'milieu.'" This would resonate, Lemke (2014: 11) suggests, with current forms of vitalism and new materialist

scholarship; “life is not a given but depends on conditions of existence within and beyond life processes.”

The chapters in this book seek to address different conflated zones of life at particular times and scales, from the genome to the human body and the global environment. Life itself is currently one of the most active zones of politics and economic production, as biological material is increasingly the subject of engineering, banking, reproduction, and exchange. The description and broad implications of these developments represent some of the most challenging issues on the academic agenda at the beginning of the twenty-first century. This is highlighted by numerous recent studies in the social sciences, humanities, and life sciences. Often associated with the “culturing” of life and the biosocial turn, these events suggest new kinds of concepts, theoretical perspectives, and politics, calling for new forms of engagements – and new anthropologies of life.

Speaking of “biosocial relations,” I am arguing, helps to capture the hybrid nature of life itself; in particular, it facilitates sensitivity to differences and similarities in hierarchies involving the fashioning of life, the reproduction of bio-objects, exchange between humans and across the species divide, and the co-constitution of humans, other animals, and, more generally, the environment. The discussion moves along broader spheres of life – biomes, ecosystems, and the Earth itself – to illuminate different contexts of life, associated notions of agency, and their place in various forms of environmentalism and biopolitics.

There are good grounds for rethinking the human condition and the Kantian question: “What are human beings?” For one thing, the post-human condition is rapidly advancing, with the growth of artificial intelligence, human prosthetics, and cognitive science. With the new genetics, moreover, what used to be called “life itself” is increasingly modified by humans through artificial means, undermining the separation of the “natural” and the “artificial.” As Rabinow (2008: 14) argues, this calls for systematic theoretical reflection and ethnographic documentation: “[T]he *logos* of *bios* is currently in the process of rapid transformation. Therefore, a central question before us today is: given a changing biology, what *logos* is appropriate for *anthropos*?” Often associated with the notion of “biosociality,” this turn of events was first documented in the context of feminist studies of reproductive technologies (Martin 1987, Carsten 2004, Franklin 2013). While the new genetics and reproductive technologies firmly placed biosociality on the theoretical agenda, in an important sense biosociality is characteristic for human life (Dupré 2012, Ingold and Palsson 2013). This seems to demand new kinds of concepts for anthropology and related fields.

Speculations about the unity and integrity of the discipline of anthropology have been recycled repeatedly. As early as 1936, Franz Boas remarked that for

a few decades physical and social anthropology had been drifting “more and more apart” (Boas 1940: 172). It may seem that, especially with the new genetics, the ruptures within the discipline have become terminal – continental plates, in geological terms – with profound translation problems between subdisciplines, and there are recent cases of departmental fission along these lines in North America, defying the classical four-fields approach. Thus, Segal and Yanagisako (2005) suggest that it is time to question what they call the standard oath of loyalty to the unity of the discipline. Moreover, European biological and social anthropologists continue to operate on different terrains in the disciplinary landscape (Ingold 2001), often speaking past each other. Yet the overall trend does not seem to be toward a complete split along the nature/society divide. Indeed, there are growing demands for reintegrating the natural and the social and for strengthening transdisciplinary forums and collaborations, some of which have genomics-and-society as an important theme.

The trajectories of the two major subdisciplines of social and physical anthropology thus invoke Zeno’s paradox of Achilles and the tortoise. Challenging Achilles, a skillful athlete, to a race, the tortoise reasons that it is bound to win as long as Achilles gives it a small head start. Achilles concedes the race, convinced by the argument of the witty tortoise that it would be endless: Once Achilles covered half the distance between them, he would have to cover half the remaining distance, and so on forever. Whereas Achilles and the tortoise imagine that the distance between them will be successively reduced without ever being eliminated, biological and social anthropology seem to refuse to separate despite continually drifting apart for over a century and despite the apparent acceleration of the drift in the wake of genomics. The paradox may be resolved not by logical or mathematical tricks along the lines of the ancient Greek but by the fact that nature and society have been redefined.

One important focus of recent debates on anthropological theory relates to the notion of the biological and the ways in which it – rather arbitrarily, I argue – splits the discipline of anthropology. One of the avenues with important implications for anthropologies of life might be called the “biosocial turn.” Given such a turn, anthropology has become an integral part of an expanding network of disciplines that embraces and advances dialogues between social and biological perspectives that have tended to be separated.

## 1.2 The biosocial turn

One of the early precursors to the concept of the biosocial is Mauss’s reference to the “biologico-sociological” in his classic essay “Techniques of the Body” originally published in 1934 (Mauss 1973). For Mauss, the “habitus” represented by acts like walking, swimming, and dancing was both a biological and

a sociological phenomenon; movement was normative both because it was bodily inscribed and because it was informed by the traditions of the community involved. Since the 1960s, at least, following the launch of the *Journal of Biosocial Science* in 1969, which replaced the *Eugenics Review* published by the Galton Foundation, the concept of the “biosocial” has often been used loosely with reference to “the common ground between biology and sociology,” to quote the journal’s home page (Journal of Biosocial Science 2007). In a review of the first issue of the journal, published in *Man*, Roberts (1970: 133) suggested the main problem for the journal would be to establish meaningful common ground, emphasizing that it was “not sufficient merely to put papers on human biology within the same cover as others dealing with the social sciences.” A similar concept of the biosocial has been highlighted by The Biosocial Society (2007), an international academic body which “aims to foster closer collaboration between those biological and social sciences engaged in exploring human biological and social diversity.”

In the 1970s, the dualism of the social and the biological was sometimes rendered as “biosocial anthropology.” For Fox (1975: 2), biosocial anthropology was neo-Darwinian, a branch of evolutionary biology: “[I]t accepts as its premise the role of mutation and natural selection as the main point of departure for the analysis of anything concerning the life processes of any species. It views social behavior, then, as the outcome of an evolutionary process and analyzes it as such; cultural life being an outcome of the same process and only understandable in these terms.” Knowledge of what people make of themselves is subsumed under biological knowledge of the human being. “Biosocial analysis, it should be emphasized,” Fox (1975: 2) continues, “is an analysis of the interplay between biological ‘givens’ – whatever their nature – and cultural responses. Many responses are possible, but always to the same givens. What this mode of analysis opens up is a new possibility for getting at the givens and hence a better chance to understand the variation in the responses.” Interestingly, this notion of biosociality seems to have largely been forgotten; it hardly leaves a trace in the rapidly growing literature on biosociality in anthropology. Perhaps it testifies to the dual split of the biological and the social wings or subdisciplines.

In these cases, the biosocial (and the “biologico-sociological”) refers to two separate relational systems, one biological and the other social, suggesting a dualistic division of academic labor. Inherited from Durkheimian theory, this dualism was underlined in Mauss’s work. For him, the notion of the “cogwheel” (Mauss 1973), a reference to some kind of mediating psychological mechanism, ensured the coordination of the two spheres of the biological and the social. While Mauss and several others drew attention to the body, it remained silent or absent-present in social thought; and either it was marginalized or it was subjected to the reductionist gaze of the

biological and medical sciences. This is what Ingold (2001: 256) refers to as the “complementary approach,” an approach that aims to “put together the partial accounts of human life obtainable to each of the two planes, of nature and society, to produce a complete ‘biosocial’ picture.” The alternative “obviation approach,” he suggests, would reject the complementarity assumption “not . . . by simply collapsing one side of the dichotomy into the other as in the more extreme forms of socio-biology and social constructivism, but by doing away with the dichotomy itself” (Ingold 2001: 256–257). Franklin (2003: 66) cautions, however, that while it is no longer possible to see the “natural” and the “social” as ontologically different, “the natural facts–social facts distinction may need to be reinvented, rather than discarded, in order to understand the kinds of connections and relations being produced in the context of the new genetics.”

A very different notion of “biosociality” from that of Mauss and Fox arrived on the scene in an important essay by Rabinow (1996). In his vision, the conceptual division of nature and culture was about to collapse with the new genetics and the mapping of the human genome, eventually completed soon after the turn of the century. Developing a similar argument, Rheinberger (2000a: 19) suggested that the molecular biology advanced between 1940 and 1970 not only represented a paradigm shift founded on the notion of information, but also gene technology facilitated “the prospects of an intracellular representation of extracellular projects – the potential of ‘rewriting’ life.” Indeed, the root meaning of the word biotechnology is living technology, biological artefacts serving human ends. The traditional dichotomy between “nature” and “culture,” then, no longer makes much sense. Arguably, the reality of “biosociality,” the conflation of the biological and the social through modern biotechnology, dissolves the earlier concept of the biosocial – the notion of the complementary spheres of biology and society usually seen to underlie the dualistic structure of the discipline of anthropology and, in fact, most academes.

The product of a long process of evolution spanning at least 200,000 years, humans now reinvent themselves in a new sense and on a fundamentally new scale, deliberately altering their bodily constitution and development partly by exchanging genes, tissues, and organs with both conspecifics and other organisms. Foucault’s works on biopolitics (see, for instance, Foucault 1994) have obviously contributed critical insights with respect to the current refashioning of the human body, illuminating the political and governmental dimensions of these developments (Rose 2005, Gottweis and Peterson 2008). Recently, a series of scholars have revisited the early writings of Marx, sometimes in combination with Foucauldian perspectives, in their attempt to make sense of the political economy of modern biotechnology, including the fragmenting of body parts and the labor process involved.

Underlining the conflation of the social and the biological, Thacker (2005: 17) has recently argued that with biotechnology human bodily material has been turned into machines: “Using the cut-and-splice techniques of genetic engineering, scientists can insert the human gene into the bacterial plasmid . . . As the bacteria replicates, so will the inserted human DNA, making for a kind of biological copy machine.” Knorr-Cetina treats laboratory mice used in the production systems of experimental science as “biological machines.” To her, the notion of the machine can be used as “a master analogy for the ontology of objects” in the experimental system of the laboratory: “The autonomous production units into which organisms are decomposed . . . are *molecular machines*. Other materials in the lab may not function on a molecular level, but they are still used and usable as *biological machines*” (Knorr-Cetina 1999: 149; emphasis in the original).

Like many other anthropologists, Lévi-Strauss was concerned by the neo-Darwinian reduction of social practices and institutions to evolutionary processes of selection, fitness, and the like. Given the enormous theoretical significance he attributed to the nature/culture divide, the key binary opposition in his structuralism, one might not, perhaps, expect Lévi-Strauss to be prepared to go beyond it. Nevertheless, he seems to have sensed the destabilization of the nature/culture divide itself in the wake of the new genetics. When pressed about the implications of genetic discoveries and the extent to which they might eliminate the distinction between nature and culture, he responded that the distinction maintains its value in that it “provides a barrier against those offensives, such as sociobiology, made by simplistic and limited minds, that would have cultural phenomena reduced to models copied from zoology” (Lévi-Strauss and Eribon 1988: 106). However, he adds an important qualification:

If one day the boundary between nature and culture vanishes, it won't be along what we refer to today as the interface between human and animal phenomena, i.e., there where certain human characteristics, such as aggression, seem to resemble what is observed in the behavior of other species. *If this change takes place, it will occur elsewhere, involving the most elementary and fundamental mechanisms of life and the most complex human phenomena.* If the boundary is to disappear it will be behind the scenes where partisans of culture and nature are presently debating. (Lévi-Strauss and Eribon 1988: 106; emphasis added)

For a long time, anthropologists have pointed out, drawing upon their ethnographies from non-Western contexts, that the nature/culture opposition is not a universal one. Although the Hageners of Papua New Guinea, Strathern (1980) argued, *did* make a distinction between the wild and the domestic, that distinction did not seem to carry the main connotations usually applied to nature/culture discourse, including the idea of natural law and human mastery. More recently, some anthropologists have argued that while dualism may be



evident in some non-Western contexts, it may take radically different forms. Thus, Viveiros de Castro (1998) suggests the term “multinaturalism” to capture the essence of Amerindian conceptions, in contrast to the *multiculturalism* of Western cosmologies. Amerindian concepts, he suggests, reverse the key axis of modernist thought by setting human culture, not nature, as the universal or the *a priori*, assuming that *nature* is differentially constructed by cultural subjects. Perhaps, the Amerindian perspective of multinaturalism testifies to the resonance of many “indigenous” views with the recent notion of biosociality.

The nature/society divide in social and biological theory has been heavily theorized and criticized for decades. For some scholars, as a result, “biosocial” thinking is simply old wine in new bottles. It would be a mistake, however, to dismiss current thinking along these lines as mere repetition. A broad biosocial momentum seems to be taking place across academe, in both the social and the life sciences. The deep-rooted antagonism of the social and the life sciences, each of which has sought to debunk or colonize the other, has somewhat surprisingly and rather quietly given way to an open collaborative zone that renders the nature/society divide utterly trivial and out of place. As Meloni (2014: 3) puts it, “the two extreme wings of the nature/nurture dichotomy are equally destabilized by the new biosocial terrain.” Drawing upon recent developments in neuroscience, genomics, epigenetics, and social studies of race and inequality, he concludes that “the contemporary presence of genuine conceptual transformations in so many disciplines is unprecedented and has never been favoured by scientific evidence to the extent it is today” (Meloni 2014: 11). For Meloni, the “extreme sociality of biology” is not the product of some cultural logic but “*a realist sociality*, so to speak, something that is intrinsically part of the functioning of the facts of life” (2014: 13; emphasis in the original).

One sign of the current biosocial momentum is the growing dissatisfaction with the interactionist rhetoric of gene–environment, body–society, and nature–nurture. The language of interactions, it is argued, misconstrues life itself, artificially separating in advance the domains that supposedly interact in the process of life. In Ingold’s words:

That life unfolds as a tapestry of mutually conditioning relations may be summed up in a single word, *social*. All life, in this sense, is social. Yet all life, too, is *biological*, in the sense that it entails processes of organic growth and decomposition, metabolism and respiration . . . It follows that every trajectory of becoming issues forth within a field that is intrinsically social and biological, or in short, *biosocial* . . . This is why we speak of humans . . . not as species beings but as biosocial becomings . . . *The domains of the social and the biological are one and the same.* (Ingold 2013: 9; emphasis in the original)

A similar idea that moves beyond the interactionist perspective is that of “body worlds” in some recent archaeological works. The common-sense view of the

body as a natural, physical object eventually dressed up in “culture,” Harris and Robb (2013b) argue, is not only a historical product, emerging with the “body as machine” in the sixteenth century, it is also seriously flawed and incomplete in that a universal “natural” body doesn’t pre-exist the “social” body: “[H]umans can never not be social. The very structures and processes of the physical body itself always develop within social relations” (Harris and Robb 2013b: 213). The fact that body worlds differ with time and place doesn’t mean that there is “a single ‘real’ (biological) body” (Harris and Robb 2013b: 215); the body is biosocial throughout.

In some ways, the framework of biosociality captures what is often referred to as “nature-cultures” in the literature. Some interpretations of the latter, however, suggest a critical difference that needs to be addressed. Goodman (2013: 361) rightly points out that “the division between biology, the humanities, and the social sciences has reinforced an understanding of bodies as unchanging natural entities.” The notion, however, of “cultural-biologicals” which he advances to capture “the cultural that is always in human biology” seems to assume the existence of a “pure” biological substrate, some kind of bare life, that becomes infused with culture through practice: Such a notion, Goodman argues, will advance “appreciation of how the local *gets into bodies* and becomes biological” (2013: 360; emphasis added). The “local” is always necessarily there.

### 1.3 Biosocial relations

As I have argued elsewhere (Palsson 2013), humans can be seen as ensembles of biosocial relations. Human becoming, in fact, is a thoroughly relational, biosocial phenomenon – collective history embodied and endlessly refashioned in the *habitus*. Race, gender, social class, and other themes on human variation are social as well as biological, embodied signatures of human relations and histories, indicators of degrees of well-being (Bliss 2012). “Biology,” in such a broad biosocial sense, is destiny. This is not, however, to succumb to dual determinisms, one social and another biological. Humans fashion their lives and contexts through their agency, practices, and politics. Fortenberry (2013: 165) suggests, in the context of the significance of microbiomes, that rather than avoiding the issue of “color” (becoming color-blind) microbiome researchers should closely attend to it since it is likely to reflect racial disparities in health: “[T]he microbiome becomes a critical tool for understanding the pervasive influences of inequality that are the social, psychophysiological, and environmental contexts that link racial/ethnic categories and health.”

An extended notion of social relations of production may be useful for capturing new hierarchies and articulations of the social and the biological in

the reproduction of life itself, what might be called *biosocial relations of production*. Coupled with detailed ethnographies of biomedicine and the bioindustry, such an extension may serve to highlight the micropolitics of what Marx referred to as living labor. While Marxian rhetoric has often been at odds with ethnographic description, it seems to make good sense to apply Marx's notion of mode of production to the fragmenting and co-constitution of bodies and the reproduction of bodily material. A Marxian approach along these lines is already in the air. Several important works have drawn upon Marx's concepts of labor, estrangement, and species-being; see, for instance, Thacker (2005), Thompson (2005), Sunder Rajan (2006), Dickenson (2007), and Haraway (2008). Even Derrida (1994: 67), the arch-deconstructivist, conceded in his *Specters of Marx*: "The critical treatment to which . . . [Marx] subjects the abstract concepts of Nature and Man as man remains a rich and fertile one." Some of Marx's notions are surprisingly relevant, almost hyper-modern. Applying them to the novel domain of biotechnology, however, needs some qualifications and fine tuning.

One of the hybrid developments that sparked my writing on these lines was the birth of seven "sensational" pigs at the Foulum Research Centre in Denmark, reported in the daily *Politiken* in August 2007; apparently these were the first "Alzheimer's pigs" ever, the result of cloning and genetic manipulation, with an added human gene implicated in the onset of Alzheimer's disease. The seven pigs (a magical number, indeed), it was hoped, would develop symptoms similar to those experienced by Alzheimer's patients, providing new opportunities for researchers to explore brain tissue at different stages of development. Perhaps, the comparison of human and animal slavery, as a result, needs some rethinking. At least, the novelty of such cases would fly in the face of much classical social theory – for instance, Durkheim's thesis of totemic associations of animals and humans. For him, the totemism of Australian "primitives" represented dubious analogies between people and certain animals: "[T]here is nothing in experience which could suggest these connections and confusions. As far as the observation of the senses is able to go, everything is different and disconnected. Nowhere do we see things mixing their natures and metamorphosing themselves into each other" (Durkheim 1971: 235–236). We do, indeed, "see things mixing," as the case of the Alzheimer's pigs demonstrates. In Marxian terms, this is lively production, the collaborative project of pigs and humans.

There is good reason, I suggest, drawing upon Haraway (2008) and some others, to extend the notions of production and estrangement to the realm of human–animal relations, in particular the role of non-human animals in experiments involving human diseases and the development of "spare parts" for human use. As Haraway (2008: 46) puts it, "What . . . if *human* labor power turns out to be only part of the story of lived capital? . . . [W]hat if the

commodities of interest to those who live within the regime of Lively Capital cannot be understood within the categories of the natural and the social that Marx came so close to reworking but was finally unable to do under the goad of human exceptionalism?" In fact, the Marxian approach to human production systems has sometimes been applied in an extended sense to human–animal relations of production. Such an approach was developed by Tapper (1988) to illuminate both the different ways in which animality and humanity are socially constructed and the different hierarchies involved in human–animal production systems:

A Marxian classification of social and economic systems by *mode of production* is not apposite, since its central component, comprising *human* social relations of production, does not take account of relations of production between humans and animals . . . More useful . . . is to cast a Marxian frame around the classic typology of production systems, which *are* characterized by specific human–animal relations of production. These systems are hunting and gathering, pastoralism, agriculture and urban-industrial production. (Tapper 1988: 52; emphasis in the original)

Tapper's comparison of these systems underlines that hunter-gatherers, unlike most other producers, typically live in complementary relations with the other animal species in their environment, often describing exchanges with them in terms of an ethos of reciprocal, co-operative exchanges. Sometimes, hunters tame particular animals (such as reindeer), taking individual animals out of their natural species community to provide labor for humans and treating them as slaves. In such "ancient" systems of production, which also characterize cultivators who use draught animals, the reproduction of the animals is under the control of their human masters. Among pastoralists, in contrast, production is based on animals that are not tamed but are herded in communities; while the herds are monitored and managed by their human masters, the relationship is "like a contract or transaction in which the masters 'protect' the herds in return for a 'rent.'" This resembles the Marxian conception of feudal relations between lord and serfs" (Tapper 1988: 53). In the modern form of pastoralism, in ranching, to provide one more contrast, animals are herded in large numbers with no personal relations with the owner of the ranch: "These seem . . . to be typical – paradoxically for a modern offshoot of capitalism – of Asiatic-Oriental relations of production. Indeed, the cattle 'barons' of the Texas ranges should perhaps be termed 'sultans' – or 'moguls', like their oil-rich successors" (Tapper 1988: 53). Finally, in urban-industrial society, in battery- or factory-farming, animals are reduced to machines and exploited along classic capitalist lines (Lien 2015). Such an approach underlines the hierarchies of human–animal production systems, using a variety of terms – reciprocity, co-operation, slavery, contract, protection, and exploitation – that focus on one or more aspects of the system: the human producer, the animal, and the relation involved.

An extension of Tapper's original thesis beyond its "natural" production domain to that of cross-species projects in biomedicine and biotechnology seems pertinent. Not only are xenotransplantations routine operations, with humans on the receiving end of organ transplants, human genes are nowadays increasingly introduced into alien bodies – in particular, pigs – for the purpose of studying the onset and development of "human" diseases. One example is the "Alzheimer's pigs" previously mentioned. While laboratory animals are subservient to humans in both xenotransplantation and gene transfer, these two contexts position pigs in radically different kinds of biosocial relations to humans. In the former they are raised to produce "spare parts" to be inserted into human bodies for repair, while in the latter their bodies operate as both surrogates for human body parts and living laboratories for exploring malfunctioning human bodies. Presumably, the former are manufactured on a rather large scale, by some kind of "sultan" or "baron," while the latter are produced and raised in small numbers with greater attention to individuality, care, and detail. At any rate, while the animals employed by biomedical laboratories may produce "one-sidedly," for a specific *human* purpose, they hardly do so in the Marxian sense of producing only themselves.

The notion of relations of production, it may be noted, has been applied with somewhat similar aims in radically different contexts – for instance, that of textual studies and translation theory. Thus, Lefevere and Bassnett (1990: 11) emphasize the relation of power between source (original text) and receptor (translation): "[A]lthough idealistically translation may be perceived as a perfect marriage between two different (con)texts, . . . in practice translation takes place on a vertical axis rather than a horizontal one. In other words, either the translator regards the task at hand as rising to the level of the source text and its author or . . . the translator regards the target culture as greater and effectively colonizes the source text." Sensitivity to relations and hierarchies, I suggest, is essential for "thick" descriptions of new forms of life and, by extension, for informed biopolitics and governance. What, then, should the reference to biosocial relations of production be taken to mean and how might it be applied to bodies and their disembedded products?

At one point Marx speculated on the production zone most likely to generate dynamic economic developments, comparing the tropics and temperate regions: "A too prodigal nature," he suggested, "fails to make man's own development a nature-imposed necessity. It is not the tropics with their luxuriant vegetation, but the temperate zone, that is the mother-country of capital" (1976: 513). The "mother-country" of modern biocapital, of course, is nothing less than life itself. Such a notion, in fact, is more pertinent than Marx could possibly have anticipated, given the central importance of the human body in modern bioindustries, the relative role of life, in contrast to the dead labor of machines. Thus, Thacker (2005: 182) suggests that "Marx's distinction

between living labour and dead labour be taken quite literally. Living labour in the biotech industry is, quite simply, ‘life itself.’”

#### 1.4 Moving concepts

Rabinow did not elaborate on the meaning and potential usefulness of the biosociality concept. Whatever his original intentions and motivations, the concept took on a life of its own. While nowadays it has become an established part of the vocabulary of students of the humanities and the social sciences focusing on the new genetics, testifying to some kind of usefulness, different authors are not necessarily operating with identical ideas. For some, biosociality refers to changing notions of identity and belonging in the wake of the new genetics, in particular the ways in which people organize themselves into groups on the basis of emerging evidence of the genetic risk of developing a disease, tracking down relatives and people with a similar predicament, and lobbying for research and, possibly the development of drugs or other remedies. In Thompson’s words, “[t]he notion of peoplehood that scholars of medical technologies have coined and begun using is ‘biosociality’” (2005: 252). Such forms of biosociality depend on a host of factors – among other things, access to the Internet and local notions of health, medicine, personhood, and expertise. As Rose (2005: 147) points out, the kinds of biosociality found in the United States, Europe, and Australia reflect particular conceptions of citizenship and personhood: “[S]uch forms . . . have no visible presence in many geographical regions. AIDS biosociality in sub-Saharan Africa is very different from that of Paris, San Francisco, or London.”

Hacking (2006: 81), no doubt, is right in suggesting that the notion of biosocial identities has appealed to many students of biotechnology in recent years: “Currently, the genetic imperative – the drive to find biological, but above all genetic, underpinnings for all things human, in sickness or in health, in success or in strife – is fueling fascination with this concept.” On the other hand, for a growing number of scholars the usefulness of “biosociality” seems much broader, extending far beyond identity and belonging. In their examination of the literature, Gibbon and Novas (2007) both identify the key conceptual arenas where the biosociality concept has gained currency and explore how the concept may be put to work in new ways. While biosociality, they suggest, has often been used in reference to the identity practices already mentioned, it has also been applied both to the reframing of the nature/culture divide and in the context of emergent and unfolding arenas of scientific inquiry. It may be difficult to avoid the dualistic traps of the early language of the biosocial; thus, the twin notion of “biologies” and “socialities” seems to be a tempting alternative. However, the refiguring of life itself, the reality of biosociality, necessarily destabilizes such dualism.

Rheinberger (2000a: 29) argues that with molecular biology and gene technology we have become “aware that we live in a world of hybrids for the characterization of which we run short of categories.” I suspect that to many people the category of biosociality, along with several others, has served exactly that purpose, of capturing some of the hybrids of modern biotechnology. Indeed, reflecting on his concept fifteen years after its launch, Rabinow suggests that “the question was: how had sociality changed given the rise of the new understandings of genetics? Thus, the term biosociality was coined as an initial attempt at *framing the issue of re-problematization of ‘life’*” (2007: 188; emphasis added). It seems pertinent to speak of biosocial relations of production to capture the biosocialities involved, the different materialities and hierarchies of the political economy of the fragmented body. The point, of course, is not to construct a tidy and rigid classificatory scheme, but to facilitate sensitivity to differences and similarities.

While my discussion has sought to outline in fairly general terms an important territory for further theoretical exploration and empirical description, drawing upon the insights of several scholars representing several disciplines, at this stage some qualifications are needed. For one thing, the Marxian notion of labor may be extended too far in some of the recent works experimenting with Marxissant vocabulary. Thacker (2005: 300) argues that “Marx’s conditions of labor power have been rewritten by the biotech industry”; now, he suggests, it is not “the human worker, who views his or her labor power as property to sell, exchange, and circulate” but “a nonhuman biological network of cell lines, tissue cultures, and genomic databases. Labor is not, then, real-time labor of the physical body; instead it is the archival labor of cell cultures, databases, and plasmic libraries.” Clearly, cell cultures, databases, and plasmic libraries do valuable work, but to see such work as “labor” seems to presuppose consciousness of a relationship to that which is being produced, given Marxian theory (see, for instance, Arendt 1958: 96–101), which is hardly the case for biosocial assemblies of this kind. Perhaps it makes sense in some contexts to speak of “production” rather than “labor.”

On a related score, the issue of alienation and estrangement needs to be theorized and explored more closely in the context of biotechnology, given the different mediations and circulations of bodily material in the biosocial process of production. While the extension of such notions, I suggest, to the extraction of some bodily material (organs, for instance) is obviously illuminating, with increased distance from the production site (in the case of tissues, cell lines, and databases, for instance) claims about alienation and estrangement become progressively less persuasive. Arguably, moreover, the biosocial relations of production sometimes *render* a “thing” as “mine” that wasn’t property in the first place, resulting in a subjective feeling of alienation and estrangement. This seems to hold, for example, for the collection of cell lines from “indigenous”

communities, sometimes resulting in charges of biopiracy. Some scholars have theorized, one may add, that with the New Economy “we may be witnessing the end of property in the person, that is, the end of modern notions of personhood” (Adkins 2005: 126). Such an argument seems to have important implications for the understanding of a number of aspects pertaining to the kinds of biosocial relations discussed here, including those of the concepts of labor, gender identities, and alienation and estrangement. If it no longer makes sense to speak of property in the person, does it make sense to speak of the alienation and estrangement of body parts?

A further qualification relates to the temporality of biotechnology. Focusing on the industrializing of organisms, Russell (2004: 9) suggests that their capacity to work, much like that of the human laborer, is always limited by particular lively properties and particular biographies. While this is an interesting and potentially useful perspective, it obscures an important aspect of certain kinds of biotechnologies. As Landecker (2007: 11) emphasizes, the development of laboratory tissue culture implies *regulating* cellular time, manipulating biographies: “[C]ells freed from the bounds of the body are also freed from the limits of the originating organism’s lifespan.”

Decades ago, Bennett (1976: 4) suggested that the concept of “human ecology” was a myth; due to the “growing absorption of the physical environment into the cognitively defined world of human events and actions,” he reasoned, “there is (or shortly will be) only, and simply, Human Society: people and their wants, and the means of satisfying them.” The recent development of biotechnology and the industrializing of organisms make such a statement even more pertinent than before. Not only is the “physical environment” increasingly rendered as human construction; life itself is a biosocial artefact. The mother country of biocapital, as we have seen, is characterized by the manufacture of many kinds of “natures” involving a variety of bodily exchanges among humans and between humans and other animals. Several social theorists have argued for a constitutive model of the “person,” underlining that individuality necessarily presupposes involvement in social relations. For Marx, for instance, the individual is “an ensemble of social relations” (Marx and Engels 1970: 122). Likewise, drawing upon Melanesian ethnography, Strathern (1996) has theorized the notion of the “dividual” person, an aggregate of networks and relations. It makes sense, I think, to talk about the person as a dividual ensemble of *biosocial* relations.

It would be too idealistic, however, to say that humans, at last, are mastering nature; this would mean lapsing into the modernist framework that seems to have more or less crumbled under the pressures of advancing evidence of biosociality. Surely, however, life itself is being intentionally refashioned, possibly relegating evolution to the back seat. This turn of events not only suggests revised division of academic labor, post-disciplinary collaboration



across the now suspect nature/society divide; it also demands new kinds of concepts, politics, and ethics. For a growing number of scholars, the notion of biosociality captures these developments, undermining early dualistic notions of the biosocial. The task remains to systematically chart the bewildering complexity of relations, hybrids, and hierarchies in the making, to explore how the agents involved understand them, and to unpack what they might mean in the broadest sense for both contemporary and future biosocial life. Some of this complexity is explored in the following chapters.

