BOOK REVIEW

Revolution, Reconciliation, Integration: Is There a Way to Bring Social and Biological Anthropology Together?

Sociality, Hierarchy, Health: Comparative Biodemography: A Collection of Papers. National Research Council, edited by Maxine Weinstein and Meredith A. Lane, Committee on Population, Division of Behavioral and Social Sciences and Education (2014) Washington, DC: The National Academies Press. xii + 388 pp. $70.00. ISBN 978-0-309-30661-4

The Origins and Nature of Sociality. Edited by Robert W. Sussman and Audrey R. Chapman (2004) New York: Aldine de Gruyter. xii + 340 pp. $38.95. ISBN 978-0-202-30731-2

Social Bonding and Nurture Kinship: Compatibility Between Cultural and Biological Approaches. Maximilian Holland (2012) London: Createspace Independent Publishing. xviii + 332 pp. $12.98. ISBN 978-1-480-18200-4

Biosocial Becomings: Integrating Social and Biological Anthropology. Edited by Tim Ingold and Gisli Palsson (2013) Cambridge: Cambridge University Press. viii + 281 pp. $85.00. ISBN 978-1-107-02563-9

According to many at the biological end of the social sciences, social and cultural anthropologists need to step away from their interpretative postmodern stance and embrace a more scientific framework if they wish to remain relevant[1–3] (for responses to this position, see Ingold[4] and Schultz[5]). Specifically, the application of evolutionary theory will revolutionize the social sciences, bringing them together under a single unifying framework, thus providing the same level of conceptual coherence seen in the natural sciences.[3,6] One problem, of course, is that current perspectives on evolutionary approaches are not uniform,[7] with certain voices within evolutionary biology making a plea for an "extended evolutionary synthesis" that can address the perceived weaknesses of standard Neo-Darwinism.[8,9] This proposal has been met with considerable resistance by those who do not consider evolutionary theory to be in need of an overhaul (see Wray and coauthors' response to Laland and colleagues[10]). There are also those who argue that the unity of science is itself a fiction, undermining the case that unification will cure all the apparent ills of the social sciences.[11]

Moreover, there have been calls for biological anthropologists to exercise some of the reflexivity more commonly associated with social anthropology. Writing recently in these pages, for example, Jonathan Marks[12] argued that we evolutionary types might benefit from being "better anthropologists", recognizing that we are never dealing with pure unadulterated "scientific facts," but with biosocial or biopolitical entities. For example, although "race" is not a biological category of any relevance, it is clear that some biological differences within and between particular populations reflect the influence of social discrimination and racism.[13] Similarly, the concept of the "gene" has undergone several shifts through time, and has achieved the status of a "cultural icon," one that reflects various social and political concerns that extend well beyond its role in the synthesis of proteins.[14–16] It is also apparent that the general reluctance of evolutionary scientists to take seriously the roles of development and the environment during most of the twentieth century can be understood as a shift away from anything that sounded even remotely Lamarckian, thus pushing evolutionary theory along a trajectory that led to the neglect of epigenetic and developmental effects. A certain degree of historical reflection and humility is therefore warranted when assessing the claims of evolutionary-minded scientists who argue, without any apparent irony, that their framework represents the unvarnished truth.

In particular, tiresome debates about the relative influence of nature and nurture persist to this day, generating many of the current tensions within and between the social and natural sciences. This is true despite the fact that most of those on the biological side of things acknowledge the importance of, and interaction between, culture and biology and that most researchers fervently deny any kind of overly reductionist or determinist approach. It seems clear, then, that a more integrative "biocultural" (or "biosocial") approach might pay dividends on both sides of the anthropological divide, and could do much to ease existing tensions[17] (although there are those who disagree[18]). However, the exact manner in which evolutionary theory should feature in such a biosocial approach is still in question. The four books we review here offer differing perspectives on evolutionary approaches to human behavior and hence, differing conceptions of what a biosocial approach might look like.

Sociality, Hierarchy and Health: Comparative Biodemography: A Collection of Papers is the result of a workshop "charged with examining cross-species comparisons of social environments … to examine their effects on health, longevity, and life histories." Accordingly, the book presents diverse perspectives and methodological approaches. Indeed, it is precisely this diversity that makes the book appealing. Topics range from the complexities of genomic causation to the intergenerational transfers of resources, and from sex differences in health, mortality, and reproductive life span to the impact of social connections, hierarchies, and (psycho)social stress on health and mortality in social insects, baboons, and humans. The list of authors is just as diverse and impressive, including Ron Lee, Hillard Kaplan, Kenneth

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Wachter, Ken Weiss, Joan Silk, Caleb Finch, James Carey, Peter Ellison, and Robert Sapolsky.

Great diversity is also one of the book's drawbacks, however. With the exception of a general introduction addressing some of the conflicting viewpoints presented in different chapters, there is no real attempt to connect, structure, or synthesize the perspectives offered. Moreover, the chapters typically do not engage with the arguments made in other chapters, which means one gains no real sense of where consensus lies, which makes it is difficult to work out what one should think about the conflicting views presented. Because the book is explicitly presented as a collection of papers rather than any kind of synthetic overview, one can't really complain about this, especially since many chapters work well as excellent stand-alone pieces. What it does do is increase the difficulty of reviewing the book as a coherent unit. Instead, we opt for discussing particular chapters in relation to the other works we consider here. This makes sense (to us at least) because *Sociality, Hierarchy and Health* can also be considered the odd one out. The volume uses evolutionary and biological insights as a means to understand the intersection of sociality with health-related phenomena, which in some circles is treated almost as the very definition of a biocultural approach (see for example the interviews at http://somatosphere.net/series/bioculturalism). However, it continues to work within a standard Neo-Darwinian framework, whereas the other three books share a commitment to overturning current approaches within the evolutionary human sciences.

In the first chapter of his co-edited volume *Biosocial Becomings*, Tim Ingold, never one to mince his words, states bluntly that "Neo-Darwinism is dead," brought down "by the weight of its own internal contradictions, by the manifest circularity of its explanations, and by the steadfast refusal of humans and other organisms to conform to the straitjacket that its architects created for them." As Ingold would have it, however, proponents of neo-Darwinism continue to prop it up, much like a Victorian corpse in a daguerreotype by means of various strategies (for example, suppressing dissenting voices through accusations of political motivation, prejudice and ignorance), which "marks the paradigm out as a form not of science but of fundamentalism." Sussman and Chapman offer a similarly scathing assessment of contemporary evolutionary theorizing, identifying as problematic the way that "evolutionary psychology [and] evolutionary anthropology offer a radically selfish and individualist account of human nature" that "strips away the potential for genuine moral and social development." Holland's critique is gentler in tone, but equally critical of Darwinian anthropologists who, in his view, have conflated proximate and ultimate levels of explanation, leading them to the erroneous conclusion that humans "evolve ways of actively distinguishing the identity of close genetic relatives in order to preferentially engage in social behaviors with such individuals." This, in turn, has created the false view that biological and social anthropology are incompatible and that, in large part, this is responsible for the ongoing antipathy between the two fields. Another contrast is that while Holland and Sussman and Chapman offer solutions that lie squarely within a recognizably neo-Darwinian paradigm, Ingold and Palsson argue for a more radical reconfiguring of the human evolutionary sciences.

In Sussman and Chapman's case, the radically selfish account they identify can be traced to the sociobiological focus on the "gene's-eye" level of explanation and the notion, popularized by Richard Dawkins, that genes are '"selfish." This, they argue, has placed competition and aggression at the fore in accounts of social evolution, and generated a wholly misleading and inaccurate view of human life in which there are no biological roots to ethics, morals, religious feelings, or concern for human welfare (beyond one's close kin) because, according to sociobiologists, these do not make evolutionary sense. Instead, sociobiologists resort to "convoluted" explanations of how cooperative, ethical behavior toward others arises through the formation of "illusions" that serve our individual reproductive ends and, ultimately, our genes. In place of this radically selfish view, Sussman and Chapman want to offer an alternative in which cooperation and affiliation are given their rightful place, basing their argument on Darwin's views on moral sentiments, Kropotkin's ideas concerning "mutual aid," and Sober and Wilson's more recent theoretical treatments of multilevel selection. The reasoning seems to be that, if cooperation and caring for others can be shown to have "truly" cooperative biological roots, then a "genuine" evolutionary ethics also becomes possible, whereby individuals care for others as an end in itself, not simply to ultimately secure their own individual advantage.

Having made a strong case against an individualist inclusive-fitness viewpoint, the book proceeds to offer a reassessment of social evolution from the perspective that "natural selection could favor cooperative social interactions in their own right." This includes discussions of comparative data, proximate mechanisms (cognitive, hormonal, neurological) as well as paleoanthropological insights. All of these are written by acknowledged experts in the field, including, among others, Karen Strier (patterns of sociality between kin and nonkin), Agustin Fuentes (negotiation and cooperation), Jim Cheverud (heritable variation and the evolution of social behaviors), Sue Carter (proximate mechanisms regulating social behavior), Ian Tattersall (human symbolic consciousness as an emergent property of human social life), and Richard Potts (variability selection).

Interestingly, no one on this impressive list offers quite the same stark dichotomy between a ruthlessly aggressive, individualistic sociobiology and the more mutualistic, cooperative stance put forward in the introduction; in most cases, the distinction is a question of emphasis rather than a full-blown rejection of the former in favor of the latter. This, no doubt, is because the dichotomy is not as stark as Sussman and Chapman suggest: The "selfishness" of genes is, it should go without saying, metaphorical. Genes do not literally act in their own interests in an

agentive fashion nor does the metaphor imply a "ruthlessly individualistic" stance in the manner suggested. The metaphor may be problematic (even Dawkins admits he should have followed advice and named his book *The Immortal Gene*), but the theory itself doesn't ineluctably lead to the "anti-social" stance suggested by Sussman and Chapman. Standard inclusive fitness theory clearly predicts the occurrence of cooperative, nonselfish strategies. Indeed, in the twelve years since this book was published, studies of prosociality, cooperation, and even morality within a standard neo-Darwinian framework have proliferated. (It would be interesting to know whether, as a result, Sussman and Chapman would modify their argument in any way or stick to their guns). The fact that the individuals who display these strategies leave more descendants at the expense of those who do not in no way diminishes their cooperativeness.

One can dispute many aspects of a strongly adaptationist stance. (We feel that most would agree that Wilson's sociobiological interpretations of human behavior were problematic. There are also certain aspects of the heavily adaptationist program in evolutionary psychology that we personally disagree with). However, it is not necessary to opt for an explicit group or multi-level selectionist position to accommodate an alternative view that places more emphasis on cooperation and affiliation. It is entirely possible to frame the latter in terms of inclusive fitness theory. (Indeed, multilevel selection and inclusive fitness are really not in opposition; the stance taken depends on the question of interest).[19] It is possible, of course, that Sussman and Chapman's objection actually lies with other aspects of the gene-oriented view of the modern synthesis but, if so, this is a different matter, one that requires a more radical repositioning than that presented in their opening chapter (perhaps something more akin to the "extended evolutionary synthesis" already mentioned[8,9]).

What Sussman and Chapman actually seem to object to, however, is the idea that cooperative and affiliative behaviors are underpinned by "selfish genes." At certain points in their argument, Sussman and Chapman really do seem to imply, and do so quite strongly, that if cooperation benefits an individual's "selfish genes" it somehow doesn't count as genuine. This same desire for cooperation to be truly altruistic is also apparent in the final chapter on moral philosophy, in which Stephen Pope discusses the implications of rejecting the "standard" sociobiological view: "If other primates are prone to social behavior more often than anti-social behavior, perhaps pity, empathy, and other prosocial feelings do not have to be laid on top of a substrate that is essentially anti-social." The notion that competition and aggression are inherently "anti-social" seems, at least to us, both anthropocentric and culturally charged. From a comparative perspective, to declare aggressive behavior as being inherently antisocial is to add an overt moral dimension that seems to reflect our own human interests and concerns. As Frans de Waal[20] has pointed out, for nonlinguistic species, aggression is an instrument of negotiation: it is the necessary counterpart to affiliation, allowing animals to establish and sustain their relationships with each other by helping to set boundaries on how to treat others and how they should be treated (this is also touched on in Bernstein's chapter in Sussman and Chapman on aggression and management). While it may not be overtly prosocial, aggressive behavior, viewed from this perspective, is not inherently antisocial. By the same token, the fact that some individuals leave more descendants than others as a consequence of the behavioral strategies they pursue does not mean that there is an antisocial substrate on top of which prosocial feelings are built.

Thus, while a greater emphasis on cooperation and affiliation within an evolutionary framework is to be welcomed, it is not clear that this requires the wholesale abandonment of inclusive-fitness theory. At this point, it might be worth mentioning that the book is the outcome of a symposium funded by the Program for Dialogue on Science, Ethics and Religion of the Association for the Advancement of Science, which had as one of its goals to "increase public understanding and appreciation of science and improve the level of scientific understanding in religious communities." Presenting an evolutionary stance that places almost all its emphasis on cooperation and prosociality would no doubt be more persuasive and palatable to a public inherently resistant to evolutionary ideas. Even so, to argue against inclusive fitness theory *tout court* seems rather excessive, especially since it may often be the use of poorly chosen terminology and loose language that is at fault. If there has been an emphasis on competition, "arms races," and conflict, this seems to represent individual researchers' and authors' propensities and interests (although we do concede that they also reflect societal and political influences and interests at particular times), rather than necessarily being a deep-seated problem with underlying theory.

This brings us to Maximilian Holland's book, which also offers a critique of sociobiological views. Ironically, however, the neglect of social bonding and cooperation is not seen as the problem here, but rather the way that evolutionary researchers have conflated proximate and ultimate explanations of bonding and cooperation. Holland takes as his starting point Schneider's[21] criticism of kinship studies, which argued that Western anthropologists had conflated the study of social bonds with biological relatedness because of their own ethnocentric understanding of kinship (that is, in terms of blood ties). Holland suggests that this same conflation of social kinship with biological relatedness also came to characterize the early days of the evolutionary human sciences, even as social anthropology was correcting this misapprehension. This gave rise to the prevailing view that biological and social approaches within anthropology are incompatible. Specifically, Holland argues that Darwinian anthropologists (or human behavioral ecologists or evolutionary anthropologists, as they are more often called these days) fundamentally misunderstood or, more generously, misapplied

the theory of kin selection by treating it as a description of the proximate mechanisms by which particular behavioral outcomes are achieved when, in fact, it deals only with the ultimate selection pressures acting on genes. Darwinian anthropologists thus assume that humans "evolve[d] ways of actively distinguishing the identity of close genetic relatives in order to preferentially engage in social behaviors with such individuals." Holland sets out to correct these errors of biological interpretation, identify the commonalities that exist between this corrected view and the ethnographic record, and so demonstrate the compatibility between sociocultural and evolutionary approaches to cooperation and social bonding.

To this end, Holland provides an extensive review of the theory of kin selection and its application by Darwinian anthropologists, then examines the mammalian and nonhuman primate literature. He concludes that evolutionary analyses could more productively focus on proximate mechanisms rather than fitness outcomes, and that such mechanisms are likely to consist of simple "rules of thumb" based on context and familiarity, given that there is little evidence of the "positive powers" of recognizing genetically similar individuals. Holland therefore considers evolutionary psychologists (EPs), along with the attachment theorist, John Bowlby, (who inspired the EP take on the environment of evolutionary adaptedness), as being on the right track because they specifically focus on the proximate mechanisms that serve the ultimate functions of survival and reproductive success.

To be brutally honest, there isn't much here that surprised us. Perhaps this is because the ideas presented are not particularly novel. Holland mostly lets other scholars do his work for him, with a large number of lengthy quotations. Schneider's seminal work does most of the heavy lifting in the first chapter, while Kitcher is used to argue against Darwinian anthropology, Sherman is pressed into service when reviewing aspects of kin discrimination and recognition in other animals, Bowlby provides the detail of attachment theory, and Weismantel aptly supplies Holland's final conclusion. If one is familiar with this literature, the book provides a useful summary. If one is new to the area, however, then the book provides an excellent entrée to the primary literature, largely from a historical perspective. Holland has carefully synthesized all his chosen authors' positions and constructs his larger argument around these quotations, generating a highly readable, carefully argued historical account of kinship and cooperation studies. The downside here is a nagging feeling that Holland does not add much that is theoretically novel in terms of synthesizing social and biological anthropology.

The book also has a curiously old-fashioned feel, with a heavy reliance on references that are decades old. This is not surprising once one realizes that, although published in 2012, the book is a reprint of the author's PhD thesis from 2004. Although Holland states in the preface that his argument remains as relevant today as it was more than a decade ago, there have been significant theoretical and empirical developments that would have bolstered his argument and increased its relevance. For example, Sarah Hrdy's[22] updating of attachment theory in *Mothers and Others* is an obvious omission, particularly since she makes extensive use of the ethnographic literature to support her evolutionary analysis. Similarly, it would have been interesting to see what Holland would have made of more recent evolutionary psychological views on kin recognition and discrimination,[23] as well as novel empirical studies on phenotype matching.[24] To be fair, given that Holland's aim was simply to show that social and biological approaches are compatible, we may have expected too much. Holland does make the valuable point that Darwinian anthropologists should pay (or should have paid) more attention to the ethnographic literature. The examples he provides makes it clear that a purely "genetic account of kinship" is utterly insufficient to explain what goes on in many, if not all, populations studied. Holland also reiterates the point, frequently made by social and biological anthropologists, that a particular Western view of human nature has biased how we have studied other populations. More specifically, structural dynamics in Western populations have changed in such a way that individual households containing biological kin have become key to understanding these kinds of societies, and this, perhaps, has blinkered us when interpreting the patterns seen in other cultures.

Having said all this, we do feel that the criticism of Darwinian anthropology is often misplaced. Holland has a tendency to paint Darwinian anthropologists with a rather broad brush, with Richard Alexander coming in for particular criticism. Holland views Alexander as one of the leading proponents of the view that humans can directly recognize genetic relatives and that "behaviour always leads to inclusive fitness maximisation in the present — independently of evolved proximate mechanisms." Exactly why Alexander is the target is curious to us because, as early as 1977, he was unequivocally stating that "noone argues that kin selection works because genes tell their bearers of their own presence in relatives, and then how to behave because of it; Hamilton explained in his first papers why this is an insignificant probability."[25:918] In addition, Alexander[26,27] himself was highly critical of the "positive powers" of recognizing kin based on self-referential behavior, including the examples put forward by Sherman, one of the sources Holland leans on heavily.

Similarly, Holland seems to have entirely missed the debate that took place in the early 1990s between Darwinian anthropologists on the one hand (with Alexander at the forefront) and evolutionary psychologists on the other, which dealt precisely with the assumptions of fitness-maximization and the value of studying current adaptive behavior. Perhaps Holland most notable omission is the recognition that when Darwinian anthropologists argue that humans behave as if they are attempting to maximize fitness, this represents use of the so-called "phenotypic gambit," a stance that assumes there are no constraints, genetic or otherwise, that prevent natural selection from producing

a fitness-maximizing outcome. This may be unrealistic, as Darwinian anthropologists and behavioral ecologists would readily agree, but that is the point: It is a simplifying assumption of their chosen analytical framework. It certainly does not mean, as Holland seems to think, that "Darwinian Anthropologists advanced their hypothesis that individuals simply strive to maximize their inclusive fitness"; that is, he omits the all-important qualifier "as if" (which is explicitly included in the quotation by Gaulin and Schlegel on p.89, but which Holland doesn't seem to register). This qualifier is there to remind us that we are adopting the phenotypic gambit as a way of identifying and characterizing potential evolutionary strategy sets: behavior can be predicted, often quite accurately, on the basis of the assumption of fitness maximization. However, no Darwinian anthropologist would argue that such behavior is explained by a psychological mechanism that leads people consciously to attempt to maximize their fitness.

As a result, Holland's critique concerning the "wrong-headedness of Darwinian anthropology's agnosticism about proximate mechanisms" and supposedly "ignoring analysis of evolved mechanisms" loses much of its force. The idea that understanding proximate mechanisms enhances evolutionary explanations and the suggestion that evolution will likely produce "rules of thumb" (such as "act pro-socially towards those that feed you or those that are in the same litter") will come as no surprise to Darwinian anthropologists. Indeed, Alexander[27] himself argued for the importance of studying mechanisms alongside investigations of current reproductive outcomes, and highlighted kin recognition as an example in which both functional outcomes and proximate mechanisms had been studied extensively. The fact that the focus of Darwinian anthropology has not been on mechanisms (despite acknowledging their importance in any understanding of behavior), has more to do with the difficulty of this endeavor than does some form of scientific resistance. In addition, we would argue that one first needs to produce a detailed description of behavior and its reproductive outcomes, including how these vary contextually, before any investigation of mechanism becomes fruitful. For example, the chapter by Hooper and colleagues in *Sociality, Hierarchy and Health* links several aspects of human life history, including extended life span, extended developmental period, and a long period of postreproductive life, to aspects of sociality (support from extended family, biparental care, and nonkin cooperation). Particularly relevant here is their finding that kin-based altruism, in terms of intergenerational downward transfers of food energy and care (which occur even in the seventh decade of life), appear to be universal or at least very common among extant forager populations. This may help to explain the evolution of our long postreproductive life span. (This point is also made forcefully by demographer Lee elsewhere in the book, in which he summarizes his earlier work). Whatever "rules of thumb" underlie such kin-altruism detract little from empirical observations of how kin transfers function. Indeed, the importance of such behavior in evolutionary (optimality) models can hardly be construed as wrong-headed.

It might be fairer to say, then, that Holland, much like Sussman and Chapman, has latched onto the sometimes sloppy use of language rather than identifying a true conflation of proximate and ultimate explanations or demonstrating the existence of the faulty assumption that proximate mechanisms would (and should) directly map onto ultimate functions. Holland makes an excellent case that closer inspection of ethnographic accounts could have been used to challenge or change the assumptions of the Darwinian anthropologists' position (for example, ideas relating to the need for male provisioning of young leading to assumptions about the origins of monogamy and nuclear family units). Also, his plea for greater reflexivity on the part of biological anthropologists is well taken. Nevertheless, it is not entirely clear that the argument he presents will convince anthropologists on the more social side of the discipline. Most conspicuously, Holland uses the ethnographic literature as an empirical demonstration of the correctness of his own biologically-oriented theoretical position, with the result that social and cultural data are offered in the service of an evolutionary perspective. One can imagine that social and cultural anthropologists might, for example, continue to question the way in which attachment relations and the processes of social bond formation are assumed to be deep-seated, biologically grounded human universals that simply manifest differently in varying social and ecological contexts. Social and cultural anthropologists might similarly question how much primatology can contribute to the study of kinship, given that primates do not engage in marriage or recognize and codify fatherhood in the way that most anthropologists deem central to the understanding of any form of human kinship.[28] It may be that Holland's analysis, while convincing biological anthropologists of the value of the ethnographic literature, will not assuage the fears of social anthropologists who worry that evolutionary approaches are overly reductionist.

This seems especially likely, given social anthropologist Tim Ingold's opening chapter in *Biosocial Becomings*. This represents an all-out attack on neo-Darwinism in general and, specifically, its application to human culture. The assertion that "Neo-Darwinism is dead" does not seem to have been written by someone ready to be convinced of the value of an evolutionary approach, nor does it fit well with the gentler tone of the book's preface, in which the editors deem the integration of varying strands within anthropology as a "pressing" issue. Equally, such a declaration is likely to be met with bewilderment, and possibly some derision, by many evolutionary human scientists.[29] This would be a shame because Ingold's criticism is far more thoughtful and his views far more sympathetic to evolutionary analysis than this rather vituperative attack would suggest. Elsewhere, Ingold has provided a more nuanced and well-motivated statement of his position.[30] In this volume, however, it becomes hard to understand exactly what he objects to and, much more

problematically, how his solution works. If we were to hazard a guess, the publication of "Culture Evolves", a special issue of the Philosophical Transactions of the Royal Society,[31] was the last straw for Ingold (particularly after the rather critical treatment given to social anthropology by some of the same authors,[6] to whom Ingold also responded),[4] triggering this rather bad-tempered and exasperated response so, what is Ingold's objection to neo-Darwinism and should we take it seriously?

To be precise, Ingold is really not a fan of the modern synthesis (MS) (that is, the marriage of Mendelian inheritance and population genetics) rather than neo-Darwinism *per se* (the theory that arose from Weissman's separation of somatic and germ lines, which knocked Lamarckism on the head once and for all). It is possible that Ingold also objects to this, but his arguments seem aimed more squarely at the MS. As Pigliucci[9] has suggested, the MS heralded a shift from a "theory of form" to a "theory of genes." Indeed, evolution is now defined in terms of a change in the genetic composition of a population over succeeding generations, rather than in terms of descent with modification, as it was in Darwin's day. Put like this, it is easy to see why social anthropologists consider evolutionary approaches to be inherently reductionist (in the bad way), overly adaptationist, and gene-obsessed. No matter how much we evolutionary types argue to the contrary, if the accepted definition concerns shifts in gene frequencies, the link to understanding the history and diversity of life seems rather narrow and neglects the majority of what social anthropologists are interested in. Ingold's objection to the MS, then, is that it left out, among other things, any reference to development. In line with other thinkers, including Susan Oyama, Paul Griffiths, Russell Grey,[32] Massimo Pigliucci,[9] and Kevin Laland[8] (who, ironically, is one of the editors of "Culture Evolves"), he considers this a grave mistake. Ingold, then, is a proponent of a developmental systems perspective and apparently sympathetic to the idea of an extended evolutionary synthesis. That is, he favors an approach that will restore development to its rightful place and does not give automatic priority to genes. In developmental systems theory (DST), genes are viewed as just one reliably recurring resource that enables an organism to construct itself over the course of ontogeny, and not as a prime mover.

It is also clear that Ingold objects to the overly adaptationist leaning of many human evolutionary types and wants greater recognition of nonadaptive evolutionary processes. Ingold, then, has no problem with biology or evolution, just with the particular view of evolution promoted by the MS. Indeed, Ingold's view is probably more wholeheartedly biological than that of many evolutionary anthropologists working in the field (as odd as this may sound). For Ingold, learning to play the cello is the same kind of process as learning to walk.[30] We are not born with either of these abilities, nor do we simply mature into them; rather we achieve them gradually by practice and training in an environment with other more skilled individuals, along with a variety of supporting objects. That is, we grow into these abilities rather than simply "acquiring" them. Cello playing, in Ingold's view, is thus just as biological as walking, and does not represent some form of "cultural add-on to a universal biological substrate." Rather, the "domains of the social and of the biological are one and the same" because "the biological process of development, of the living human organism in its environment, *is* precisely the process by which cultural knowledge and skills are inculcated and embodied."[4]

This, then, apparently is why "Culture Evolves" boils the Ingoldian blood. While he has gone out of his way to eliminate the false dichotomy of nature-culture and body-mind, gene-culture co-evolution seems, to his eyes, to be wedded to both the MS and the idea that culture is a separate inheritance system grafted onto a biological substrate. Not only this, but Ingold further considers gene-culture co-evolution to be guilty of "misplaced concreteness" by assuming we have evolved a "capacity for culture" that is "universally present in all humans in advance of the diverse content with which it is subsequently filled." In contrast, Ingold, along with co-editor Gisli Palsson, regards humans not as finished projects, but as "trajectories of movement and growth"; we are not "beings" but "becomings." Our humanity is something we have to continue to work at, not something that is simply given to us as our biological inheritance.

Ingold is not alone in his critique of the MS. Chapters by Fuentes, Ramirez-Goicoechea, and Palsson, albeit it using a less combative tone, further highlight difficulties with standard evolutionary theorizing. Their subjects include the (problematic) gene concept, the importance of epigenetic process, and the recognition that humans are exceedingly well equipped to change their environments in ways that influence future generations (via niche construction). These discussions actually mirror those in the biological sciences.[9,10] Whatever one might think of this view, it certainly is a thoughtful criticism of current evolutionary approaches rather than some knee-jerk postmodern critique, as some evolutionary advocates would have us believe.[5,17]

Indeed, many of the issues outlined in the first few chapters of *Biosocial Becomings* are also addressed by the more overtly biological *Sociality, Health and Hierarchy*. Ken Weiss, for example, discusses several aspects of the workings and development of "the" genome that complicate a "simplistic Darwinian-Mendelian way of thinking." Among other things, he points out that "the human genome doesn't exist, and neither does yours" because "the" human genome is a composite reference sequence derived from "person(s) unaffected by diseases at that time." He also highlights the fact that each cell within the soma has a slightly different and unique sequence because of the vertical transmission of somatic mutations with each cell division. Furthermore, he notes that the traits of greatest interest to evolutionary biologists and demographers are also those that are highly polygenic. Given the apparent robustness of development, this leads

to a situation in which many different genotypes can give rise to similar phenotypic traits and, similarly, that given a certain trait value each individual is likely to have a different genotype. Consequently, understanding genetic causation may simply be a pipe dream. We should be cautious in thinking that we will crack the "genetic code" any time soon to the benefit of medical science.

A fascinating illustration of these principles is provided by Aglaia Chatjouli's chapter in *Biosocial Becomings*, which presents an ethnographic account of thalassemic lives in Greece. Thalassemia is a monogenic inherited disorder that causes severe and often life-threatening anemia. Serious health complications and even death may occur when the condition is not treated or is poorly treated. β-thalassemia, the most severe form, can be divided into three categories, major, intermedia, and minor, which are linked to levels of anemia and the need for blood transfusions. Phenotypically, however, major and intermedia forms can be difficult to differentiate and require detailed genotype analysis. Even then, the severity of the disease is affected by a multitude of factors, including complex molecular mechanisms. This means that the genetic classification is not conclusive, especially as cases in the same category may be linked to different genotypes.

Chatjouli describes the important biocultural implications of these categorizations and, specifically, the manner in which our accumulating knowledge of the complexity and heterogeneity of the condition makes it increasingly difficult to think of it in terms of clearly defined phenotypic sub-categories yet the "geneticisation" of medical practice helps to ensure the continued fixing of the existing categories in ways that often leads to exclusion from health-care benefits or from active patient groups (e.g., where the genotype that is discovered no longer fits the group profile). In addition, when patients are labeled with a particular diagnostic category, often at an early age, this has implications with regard to how the condition unfolds through life. This affects how patients see themselves and how others see and treat them. That is, it reveals shades of philosopher Ian Hacking's interesting notion of the "looping effect."[33] Thalassemia, then, is not simply a biological condition, but an ongoing biosocial construction. This is something that philosopher of science, Maarten Derksen, has also discussed in detail. Specifically, he has pointed out how the shifts and changes brought about by advances in biomedicine raise questions about what counts as "natural" and hence, how "human nature" is never fixed but, instead, is continually cultivated over time.[34]

Another similarity between the books is the discussion of epigenetics. Both Kuzawa and Eisenberg, in *Sociality, Health and Hierarchy*, and Ramirez-Goicoechea, in *Biosocial Becomings*, discuss the importance of epigenetic processes in human lifeways. Kuzawa and Eisenberg provides an excellent review of epigenetics and early-life events with respect to health-related outcomes, demonstrating that there are environmental effects on gene regulatory processes and that these can be (potentially) inherited by future generations. Echoing a point made by Weiss (which similarly echoes one made earlier by Pigliucci[9]), they suggest that, until recently, a desire to avoid being mistaken for Larmarckians led to some rather conservative biological thinking and the unshakeable conviction that the environment could not influence offspring phenotype other than by genetic inheritance. These biases and beliefs sustained a heavily gene-centered approach for much of the twentieth century. However, evidence from developmental biology, as well as epigenetics, now suggests that we need to incorporate developmental processes more fully and more deeply appreciate the influence of epigenetic factors. This is a point on which some social anthropologists (at least those represented in *Biosocial Becomings)* and many evolutionary biologists would at least seem to agree.

Ramirez-Goicoechea adds another layer to this discussion while again highlighting the value of a biocultural approach to understanding humans. Her chapter presents an excellent analysis of how political, economic, ideological, and biographical factors literally become embodied by pregnant mothers, with subsequent effects on their children's development. These lead to specific epigenetic states that have health consequences in later life. Structural inequalities in the U.S. mean that these fall along racial lines, with African-American mothers most strongly affected. In this way, as Gravlee[10] puts it, race becomes biology, despite the fact that race has no intrinsic biological basis.

Although all these chapters, particularly those by Fuentes and Ramirez-Goicoechea, do an excellent job explaining why current evolutionary thinking may need revising, the same cannot be said for the rest of the book. With the exception, perhaps, of Vaisman's chapter examining how gene-centric views on parenthood influenced the outcomes of a particularly tragic Argentinian court case and Palsson's concluding piece (which might have worked better as a less confrontational start to the book; see Carrithers[29] for a similar point), the remaining chapters fail to convey anything remotely related to the biosocial vision presented in the introduction. To our eyes, the other chapters were simply straight-up social anthropology. Consequently, we drew very little from these efforts, as they seemed to offer no insight into the notion of human becomings that would speak to the interests of biological anthropologists or, more generally, evolutionary biologists. Possibly this is because there are some questions that do not require any kind of biological or evolutionary stance or explanation. Alternatively, and perhaps more likely, social and cultural anthropologists, before they can begin asking and answering their questions in a more biosocial fashion, need to work a little harder and more fully register Ingold and Palsson's point that the domains of the biological and social are one and the same.

Similarly, and to make an obvious point, promoting a nondualist view of the social and biological domains requires greater interaction between

biological and social anthropologists. As Ingold notes, no social anthropologists contributed to his bugbear, "Culture Evolves"; the same is true for *Sociality, Hierarchy and Health*. The latter is perhaps more surprising, given that a fully comprehensive approach to aging, health, and disease requires attention to the political and economic factors that partly constitute human social environments. Although the papers in the book do appear to acknowledge this, most do not consider the broader political or economic context of social relations and how these might influence life history and health. The inclusion of a sociologist or social anthropologist of Ramirez-Goicoechea's or Chatjouli's stripe could have demonstrated how to contextualize our biological knowledge in ways that further inform evolutionary analyses. By the same token, however, *Biosocial Becomings* really has only Agustin Fuentes to represent the more biological side of things (and it is no surprise that this is the chapter most accessible to biological anthropologists). This is lucky because, without Fuentes and perhaps also Ramirez-Goicoechea and Chatjouli, the book would have almost no chance of persuading biological anthropologists of the value of a biosocial approach. As it is, the tone of Ingold's opening chapter, along with Ingold's and Palsson's rather dense discussion of becomings, relations, and ensembles, will probably test the patience of almost anyone who isn't a social anthropologist. Many might not even make it beyond the introduction. This would be a shame because, although we often had no clue what was going on and regularly felt bewildered and frustrated, it was *Biosocial Becomings* that, to our great surprise, left the biggest impression on us. Judging by the time it has taken to reflect on these books and write this review, *Biosocial Becoming*s also had the greatest impact on our subsequent thinking. So read it: You'll probably hate it, feel frustrated and annoyed, and sometimes terribly bored but, at the same time, you may find that you start thinking of the biological and the social in a less "dualist" fashion and more fully appreciate that these are one and the same. Although deeply flawed as an attempt, *Biosocial Becomings* is sincere in its effort to dispatch the well-worn debates about nature and nurture that have plagued anthropology since its inception. This surely has to be a move in the right direction.

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