

BOOK REVIEW/COMPTE RENDU

Myra J. Hird, *The Origins of Sociable Life: Evolution After Science Studies*. New York: Palgrave Macmillan, 2009, 260pp. \$US 85.00 hardcover (978-0-230-20213-9)

Why would a sociologist, desirous of connecting with the social life of other species, choose bacteria, rather than treading the well-worn path to our closest relatives, chimpanzees and bonobos? The answer is an historical accident. Myra Hird came upon a book co-authored by the cell biologist Lynn Margulis in a used bookstore, which eventually led to her spending a year in Margulis's lab. The latter is the kind of thing that practitioners of science studies do. The accidental origin of this book is partly responsible for both its strengths and its weaknesses.

In science studies, Hird prefers Latour's theoretical approach which, if I understand her correctly, she interprets as neither realist nor relativist (i.e., constructionist), but interactionist. This seems eminently sensible. What is not sensible is that she claims to "attend to this alliance-making in the absence of human representation or mediation" (p. 18) as if that were possible, either in science or science studies. Rather than a work in science or science studies, Hird most often describes this book as ontology, sometimes as epistemology, and sometimes as ethics.

One of the most fundamental distinctions in the natural world is between prokaryotic cells, including bacteria, whose genes are not enclosed in a membrane-bound nucleus, and eukaryotic ones whose genes are. Some unicellular organisms as well as the cells of all fungi, plants and animals — "big things like us" — are of the latter kind. Moreover, eukaryotic cells include some subcellular structures that originated as free-living prokaryotes, so their existence is in part a product of symbiosis (members of different groups living intimately together). Modern biology is in debt to Margulis for establishing this fact and she is widely celebrated for it. Hird is awe-struck by the metabolic diversity and behavioural flexibility of prokaryotic cells and their colonies; their importance as the earliest living things that we know of; their impact on the physical environment of our planet (e.g., oxygenating the atmosphere); and their current ubiquity. Chapter 2 goes "over the top" on these topics at times, describing them as "conscious" (p. 41) and "Lamarckian" (p. 44). Despite this, the chapter stands in Bishop Paley's venerable tradition of justifiable awe in the face of organic adaptations and adaptability, and all social scientists could

benefit from reading it. *The Origins of Sociable Life* is aptly titled: sociality is probably as old as life itself. After setting up the epistemic culture of Margulis's broader theory of symbiogenesis (loosely that symbiosis is responsible for mostly everything important in evolution), largely in opposition to neo-Darwinism, chapters are included on "microontologies" of the self, sex, and the environment, and "surviving humanism."

There can be little doubt that the "individual" in a world of multiple, nested levels of selection is a theoretical concept which, like "gene" for example, has to be instantiated empirically in particular cases. Here, as elsewhere in science, concepts should not be confused with things. The chapter on sex was a strange one to include in a book which began by emphasizing prokaryotes, because prokaryotes do not have sex! The term sex is normally reserved for the alteration of haploid and diploid phases, the cycle of union (syngamy) and separation (meiosis) or vice-versa, typically accompanied by genetic recombination across the entire two genomes, a process found only in eukaryotes. In prokaryotes, a variety of parasitic DNA elements do, not uncommonly, manage to get themselves transferred horizontally under stress, sometimes taking a few host genes out of several thousand with them — horizontal gene transfer rather than sex. Moreover, the author's feminism would have been better served in this chapter by going after biological theories of gender differences and relations (sexual selection theory), rather than theories of sex itself. Eukaryotic sex can take place between mating types in isogametic species which lack the differentiation between microgametes or sperm and macrogametes or eggs, the distinction which *defines* male and female (or their functions in hermaphrodites). It is theories of those gender or gender functioning differences and relations, particularly when applied indiscriminately to human beings, which have so often offended feminist sensibilities. The author frequently lumps a whole lot of quite different things into the same basket (sometimes by the device of using non-standard terminology). For example, horizontal gene transfer in prokaryotes is "sex" (p. 93), mating types in eukaryotes are "genders" (p. 101), vaginal plugs (which some male insects place in females to prevent their sperm being displaced by those of another male) are "birth control" (p. 105), female barnacles with parasitic dwarf males attached are "intersexes" (p. 91). (Not only are female barnacles with parasitic males not intersexes (i.e., with ambiguous or mixed genitalia), they are not even hermaphrodites, although the hosts may *also* be hermaphrodites rather than females. Much reduced though they are, parasitic dwarf males are recognizably males with male bodies and not just male genitalia.)

What I like most about the book is the author's obvious enthusiasm in celebrating the profusion and diversity of life and its within and be-

tween species social interactions, as well as the sheer chutzpah of telling social scientists they should pay attention to bacteria! What I liked least is a style (not unknown but not universal in contemporary science studies) which frequently indulges in complexity and allusion at the expense of simplicity and directness. Seemingly contradictory statements, perhaps intended as hedges, appear frequently and will provide plenty of fodder for those inclined to debate what the author *really* means. Most biologists would be annoyed at frequent small but significant errors and flights of fancy. Figure 2.3 is, as labeled, “Woese’s theory of The Tree of Life” (one of two, rather than the only major current contender for such), but in any event it is not Doolittle’s distinction among kinds of phylogenies as indicated in the text on p. 38. Maynard Smith referred to explaining sex, not sexual selection as a great challenge (p. 94). Transvestites are not possible with mating types, only with genders (p. 102). In just a few pages, why would one call normal heredity in bacteria “genetic exchange,” claim that they multiply “unimpeded by environmental constraints” (p. 128), and wax that “the neural pathways in my brain were imagined by my bacterial ancestors” (p. 133)? I was disappointed by how little room the grand vision of symbiogenesis extending to Gaia and of “surviving humanism” leaves for the social sciences proper, and the lack of attention to gene-culture coevolution.

If I were to ask Hacking’s classic question about this text overall — not what it *means* but what is the *point* — I would say the point is to celebrate symbiosis and to disparage neo-Darwinism. Despite her mentor’s apparent lack of appreciation for “he said, she said” (p. xi), this unfortunately strikes me as more or less true to the spirit of the latter’s more recent work, her great accomplishment notwithstanding. That is a pity because there is no real basis for claims of incompatibility. Competition is not the same as overt conflict. Both conflict and cooperation are *means*, and not the only ones, by which organisms compete. Symbiosis is one evolved strategy, among others, in relationships between members of different groups. Symbionts co-evolve, and when transmitted vertically relative to each other, can co-speciate. None of these detract in any way from the reality of phenotypic innovation in both parties by means of new genes and gene combinations in old environments, and old ones in new environments, nor of course, from the importance of natural selection in their evolution.

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