Sexual Difference, Gender, and (Microscopic) Animals:
A Commentary on Ebeling’s “Sexing the Rotifer”

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Abstract
In this commentary, the microscopic animals of the genus Rotifera, or “rotifers,” emerge as a
theory-provoking nonhuman animal. Rotifers embody otherness in ways that may intrigue
scholars within both Human-Animal Studies and feminist science studies. In their encounter
with rotifers, such fields of research (and others) might also engage each other in new, unex-
pected, and fruitful ways, as is here argued.

Keywords
feminist theory, Human-Animal Studies, otherness, Rotifera, science studies

Rotifers are surprising little animals. Microscopic in size, yet proliferating
almost everywhere, they have astounding survival skills and present both evol-
u tionary biology and feminist theory with thought-provoking challenges.
From my perspective, as a scholar in the field of feminist cultural studies, with
a special interest in the ontological status of the nonhuman in science,¹ these
rotifers have some truly remarkable features. They proliferate almost every-
where on this globe where there is water—some of them even on the surfaces
of mushrooms and moss, in saltwater environments, in the temporary pool
of water down the street, and in your sink. Yet despite this omnipresence,
rotifers have barely made an appearance within the field of human-animal
studies (HAS), perhaps partly due to their microscopic size. I would like
to argue, however, that it is also their genuine difference—how they embody
otherness—that makes them interesting and makes feminist scholarship poten-
tially useful to HAS.

Rotifers are very dissimilar to us, or indeed any mammals that are like us.
They are not furry, cute, or in need of being saved by humans; they are just a
highly different form of proliferating life. Their bodily size and shape, not
to speak of their mode of reproduction, presents us with almost no signs of
recognition. Perhaps this, too, is why they have not drawn much attention to themselves within HAS.

Otherness such as the otherness of rotifers leads to marginalization (at best), as they are continuously defined by their difference from a human norm. It is this that makes them particularly fascinating for HAS scholars. But, as Kirsten Ebeling (2010) shows in “Sexing the Rotifer,” they also illustrate how we project our naturalized (and often humanized) understandings of sex and gender onto the natural world. It is in this sense, as well as in many others, that Ebeling’s empirically rich article provides a welcome contribution to the research field of animal-human relations, as well as to feminist theory.

Consider, for instance, the feminist understanding of subjectivity, and the embodied nature of personhood. Work in this area is concerned with complex relations (of power) and translates into a focus on relations of difference and sameness. Here, difference is neither a neutral nor an innocent category (Braidotti, 1994); rather, it is a highly gendered and racialized one (Bryld & Lykke, 2000, p. 33). “Difference” here measures degrees of exclusion, especially from subjectivity, agency, and humanity. In Braidotti’s words, to be “different from” means being worth “less than,” so that our everyday understanding of difference acquires a derogatory function. As Braidotti (2006) argues in her critique of androcentric subjectivity, this leads to making entire sections of living beings into subsidiary and disposable bodies, be it through trafficking or the geopolitics of the “Big Pharma” industry. This is one example of how I think four decades’ worth of feminist theory can assist human-animal studies; in reevaluating (the way we do) difference and its sexualized, racialized, and naturalized others.

Rotifers are different, seeming to have otherworldly qualities. Found in an assortment of aquatic habitats, rotifers are small, multicellular organisms, often no more than 0.1 to 1 mm long. Rotifers are such hardy and stress-tolerant little creatures that they are featured not just in microbiology but in outer space research as well (Ricci & Boschetti, 2003). What is of particular interest here, however, is that many species in the class Bdelloidea also exhibit another set of fabulously diverse characteristics, like notably obligatory parthenogenetic reproduction (only females are present in populations). They also have short life cycles (30 days), a fixed number of cells, and the capacity to survive harsh conditions by entering dormancy.

It is the capacity of bdelloid rotifers to reproduce parthenogenetically, however, that most fascinated—and disturbed—the nineteenth-century biologists whose work Ebeling so well describes. From the vantage point of these men of science, the asexual reproduction of rotifers was a great curiosity. (In fact, the absence of sex—as the reproductive union of gametes, not as the social practices
of gender—still intrigues evolutionary biologists.) Unable to believe their technology-enhanced eyes, they desperately searched for the hidden, yet taken-for-granted male. This is an example of how gendered cultures of science gave shape to the allegedly disinterested study of the nonhuman natures of science. It is also why feminist studies of science-as-culture might prove an interesting ally to HAS.

Even today, reproduction not based on sexual dimorphism has been interpreted as evidence that asexual reproduction represents an evolutionary dead end (Schwander & Crespi, 2009). Rotifers, along with many other nonhuman animals such as komodo dragons, fish like the Amazon molly, and the old lab favorite, the nematode, C. Elegans (who only produces males and hermaphrodites), defy this, with their 40 million years of evolutionary existence (Weiss, 2005). Thus, sexual reproduction has never really been observed properly in many animal taxa, even though it is assumed to be the dominant mode of reproduction.

That is not necessarily where my own zoophilic wonder and feminist amazement end, however. Perhaps it is only where they might start, since there is also a remarkable variety of ways of reproducing sexually among animals that in themselves defy the limits of the humanist mind. Sexual behavior is much more variable than we have tended to suppose (Ah-King, 2007; Weiss, 2005; Bagemihl, 1999), and even the cellular mode of “doing sex” through two different chromosome patterns (XX or XY in mammals) does not apply to all mammals. The Transcaucasian mole vole, for instance, manages without any Y chromosome. Both sexes have instead one X chromosome, making it impossible to distinguish between male and female mole voles on the basis of genetics.

Regardless of this sexual exuberance, there is considerable emphasis on sexual reproduction within contemporary evolutionary biology. Species that proliferate and reproduce differently pose challenges to the centrality of sexual selection within evolutionary theory. It is often argued that a reduced ability to purge harmful genetic mutations condemns so-called asexual lineages to an early extinction. Yet, in spite of it all, rotifers thrive and multiply (Ramakrishna, 2000). Like other nonhuman animals that do not fit biologists’ assumptions about sex (and even less, those about gender), they continue to reproduce and seem to have done so for millions of years.

Kirsten Ebeling’s article provides ample evidence of how 19th-century scientists struggled to grasp the sexual nature of, and the unthinkable male absence in, these particular nonhuman animals. In fact, rotifers are deeply entangled in the highly gendered history of the natural sciences in more than one way. They are an intrinsic part of the universe—effervescent, yet invisible with the naked eye—that has allured since the 17th century. Rotifers
are intertwined with stories about the “facts of life” told by some of the most spectacular father figures of naturalism (cf. Schiebinger, 1994), from Carl von Linné to Georges Cuvier—the latter a diversified naturalist who in 1798 gave rotifers their designated phylum. All this, and much more, makes rotifers interesting nonhuman actors in the anything but innocent history of biology.

Ebeling addresses the historical specificities of knowledge production about rotifers, in relation to changing cultural conceptions of sex and gender. Her article offers fascinating reading not only about rotifers, but also about the sexual politics of biological practices in 19th-century Europe. She provides many good examples of the zigzagging moves from culture to nature and back to culture. All these moves clearly work to legitimate hegemonic human gender regimes that take the presence of males as a natural given. We learn how 19th-century cultural ideas of sex and reproduction were transposed onto nature (the humanly defined rotifers), and about the great lengths to which scientists went to ignore the empirical evidence that this was indeed an all-female species (and one not doomed to extinction).

These metazoan aquanauts also hold promise for feminist theory, especially given how they reach far beyond the limits of our humanist imagination. In a way, they speak of the necessity for theories of sex and gender to include the microscopic phyla along with other nonhumans, and to rethink difference, moving away from the pejorative “different from” to an accountable form of being “different to.” But feminists, with their recently revived interest in biological matters, and in nonhuman and prediscursive agency, cannot afford to make the same culturalist mistake as the historical microscopists did, thereby missing out on the wonderful effervescence of biological life in its entire sexual and asexual multitude.

What perhaps could be even more productive and thought-provoking for future studies of rotifers, however, is to consider what they could tell us nowadays about biological exuberance beyond norms of gender and heterosexual reproduction. For instance, what happens to the concept of “female” in an all-female species? Does it not lose part of its meaning, as it is so often normatively defined (by human gender) by a presumed male “counterpart”? So, in ways a feminist scholar might envy, doesn’t the rotifer in fact problematize human ideas about the assumed contingency between gender and heterosexuality quite effectively?

This is what rotifers can contribute to the field of HAS as well, since how we think about other species (and differences within our own) is critical to the endeavor of human-animal studies. The humanist history of rotifers presented to us here is a partial view and a telling story of the need to transgress artificial divisions between nature and culture, materiality and meaning. Perhaps the
world of biology, especially zoology, already provides us with living proof of our scientific blindness to the otherworldly, the alternative ways of life.

Where many feminist scholars of science have turned to science fiction and the phantasmic worlds of literature or cinema in order to enrich the feminist imagination (e.g., Bryld et al., 2000; Haraway, 1991), I believe Ebeling’s paper is significant in terms of the recent feminist turn toward biology itself and toward the history of nature (evolutionary theory), within gender studies, for providing us with these alternatives. But this is not just an ontological or post-constructionist turn of feminist thought (Lykke, 2010); it is also an epistemological one. For why shouldn’t the vibrant proliferation of rotifers (in spite of human assumptions) also speak of the fact that there are things we as researchers cannot grasp with our narrowly defined understandings of the sexual politics of evolution? In this vein, and in the endeavor to connect fields and open up new registers of “positive” difference, feminist theory may also do well to team up with zoology as well as with human-animal studies.

“Thinking with rotifers”—that is the term Ebeling uses for the interaction of scholars with these organisms. The feminist turn toward including other animals might, as I suggest here, be the next step to be taken when “thinking with rotifers.” Clearly, rotifers are not just metaphors for difference and the other; they need to be taken on their own terms. Perhaps the life of rotifers, among other sexually or asexually reproductive animals, will make a significant contribution to a more inclusive, less sexist and reductionist biology? I know that, at the least, they changed my culturalist understandings of microscopic nonhuman animals.

Inspiring literature that enables us to take steps in these directions is flourishing at the intersections of fields like feminist theory, human-animal relations, and science and technology studies (see Birke, Bryld, & Lykke, 2004). There now exists a wide range of imaginative feminist theory on sexual difference, the body, and the limitations of culturalism and the humanist world view (Braidotti, 2009; Hird, 2004, 2006; Barad, 2003). You may or may not refer to these various streams of thought, these scholarly conversations and drastically transdisciplinary collaborations (as do I and others) as forms of posthumanities (Wolfe, 2009; Haraway, 2008). The lives of rotifers, however, can assist theorists of both natures and cultures, and scholars of history, in rethinking the fundamentals of sex and gender, as well as those of race and species. Rotifers may well help us in reimaging both change and perseverance, since they have obviously managed quite well for 40 billion years to “do it differently.”
Notes

1. This interest in the nonhuman (animal, machine, environment) has translated into a feminist form of “posthumanities” (we are indebted to Cary Wolfe for this concept), and a programmatic investigation of what really counts as human within the humanities as well as within the experimental sciences. It examines various case studies that focus on the sexual cultures and natures of social theory, laboratory practice, and popular culture as they overlap and feed into each other.

2. Feminist studies abound on the gendered processes of science, past and present. The very scientific way of life that originated in seventeenth-century Europe did not simply exclude women but was defined in defiance of woman (Noble, 1992), as well as in defiance of nature (Birke, 1994; Merchant, 1980). Feminist studies also note how determinist assumptions about biological sex and about the naturalness of heterosexuality not only make different ways of biological life invisible or sensational but also translate into the justification and naturalization of unequal power relations in society. This is why cultural scholars of science say that science is politics by other means (Haraway, 1989; Latour, 1988).

References


