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27. Lynn Conway, "Basic TG/TS/IS Information," 2000–2003, ai.eecs.umich.edu/people/conway/TS/TS.html.
28. Emi Koyama and Lisa Weasel with the Intersex Society of North America, "Teaching Intersex Issues: A Guide for Teachers in Women's, Gender, and Queer Studies," 2001, isna.org/pdf/teaching-intersex-web.pdf.
29. Intersex Society of North America, "Medical Questions about Intersexuality," www.isna.org/faq/faq-medical.html (accessed November 10, 2003).
30. The ISNA's home page notes: "Intersexuality is basically a problem of stigma and trauma, not gender. . . . All children should be assigned as boy or girl, without early surgery" ("What Is ISNA?" www.isna.org/index.html [accessed November 10, 2003]).
31. Vernon A. Rosario, "Intersexes: The Molecular Deconstruction of Sex" (paper presented at the Feminist Research Seminar, Center for the Study of Women, University of California, Los Angeles, October 15, 2002).
32. Eric Vilain, "The Genetics of Intersexuality," *Journal of Gay and Lesbian Psychotherapy* (in press).

Evolution and the Embodiment of Gender

Joan Roughgarden

As transgendered people come out of the closet and cease living in stealth, a new voice in queer scholarship may emerge. Transgendered people speak of the centrality of body morphing, not merely as decoration but as definitional: the Cybelean scythe, the *hijra nirvan*, and the Western sex reassignment surgery. Extending queer theory to encompass transgender experience will probably draw attention to the materiality of gender and away from gender solely as performance.

Moreover, transgendered people bring new disciplines to the table of queer theory. Transgendered women, having been raised as boys and men, are likely to enter the male-typical careers of science and engineering, and transgendered men are likely to seek employment in such spheres. These technically educated people then wish to contribute to queer and gender theory, but they arrive on strange shores, ignorant of local customs and language, striving to be good citizens, and hoping not to tread on the bones of long-dead elders.

Here, then, is what I make of the distinction between sexuality and gender as seen from my position as a scientist specializing in ecology and evolutionary biology and as a transgendered woman.

Biologists distinguish themselves from MDs. Biologists, of course, think of themselves as enlightened, whereas MDs are ignorant troglodytes. Biologists teach MDs when the latter are still premeds, not yet community leaders, when they seem to be grade-grubbing memorizers incapable of independent thought. Biologists are

annoyed when humanists lump biology with medicine, just as humanists might object to lumping literature with television reporting.

In biology, sex means producing offspring by mixing the genes from two parents—a cooperative act. Many species reproduce without sex: by budding, by fragmentation, or with eggs that do not need fertilization. So, in biology, the existence of sexual reproduction is a contingent fact needing explanation. The advantage of sexual reproduction over asexual reproduction is still debated in biology today. In any case, sex is not synonymous with reproduction but is one means of reproduction.

In biology, male function and female function are unproblematically defined in terms of gamete size. Nearly all sexually reproducing species have gametes of two sizes, one big, the other tiny. By definition, male function means making small gametes, and female function large gametes. By definition, the small gamete is a “sperm,” and the large gamete is an “egg.” That’s it.

Now, most bodies do not easily classify into male or female, because most bodies make both eggs and sperm at the same time or at different times during their lives. The gametic binary does not define a corresponding binary in body morphology or behavior. It is a mistake to classify organisms as either male or female, as though whole individuals were unproblematically binary, just as the gametes are. Vertebrate species vary greatly in the existence and/or clarity of a sex binary between whole organisms. Indeed, even in species where whole bodies can be unambiguously classified as male or female because they make only one type of gamete during life, multiple forms of males and females may occur—say, two or three types of males that differ by a factor of two or more in body size, maturation rate, and life span and that possess conspicuously different color patterns.

I have suggested widening the word *gender* to refer to the morphology, behavior, and life history of a sexed body. A body is “sexed” when classified with respect to the size of gamete it produces. Hence a species with two types of sexed bodies may have more than two genders. Furthermore, more than two types of sexed bodies may occur: some may make only small gametes, others only large gametes, and still others various mixtures of the two gametes. Humanists often criticize biology as an ideological purveyor of the gender binary. The shoe doesn’t fit. We biologists have definitions of male and female that work for seaweed, redwood trees, whales, worms, and oh yes, dogs, cats, and people. Our definitions have nothing to do with Mars, Venus, and the mismeasure of women. Blame that on MDs and MD-wannabes.

If we go beyond the definition of male and female to gender norms, then the stance of biologists becomes more problematic. Darwin’s theory of sexual selection

makes universalist claims about male and female behavior—ardent, showy males paired with passive, coy females. These claims have been leveraged into a repressive theory of human nature by evolutionary psychologists. Nonetheless, many, perhaps most, evolutionary biologists today acknowledge that Darwin's theory of sexual selection is in trouble, but they differ on what to do about it. Many would prefer that Darwin's theory somehow be invested with new meaning so as not to do violence to his tradition. In contrast, I feel that Darwin's theory of sexual selection should be regarded as falsified because it is on the wrong track, and it should be replaced by an entirely new theory. Not all agree that sexual selection theory is false, but I believe consensus holds that something must be done about sexual selection theory in view of gender role reversal, gender multiplicity, and widespread same-sex sexuality in animals.

As to sexuality, the closest biological counterpart I can think of pertains to an animal's "time-energy budget." In a day, or a year, how much time do animals spend mating, or even looking for mates? Many species, like some chipmunks, might be said to have almost no sexuality, because they are fertile for only a few minutes a year, or maybe every other year. Other species are continuously fertile for half the year or even more. In any species, too, the animals vary in their allocation of effort to sexuality. Biology offers no norm for how much interest organisms should have in sex, how often they should make love, and so forth.

I have also suggested that the function of mating is only sometimes to transfer sperm. In many species, including humans, as well as our closest relatives, the bonobos, plus lots of birds, porpoises, and so on, mating seems too common relative to conception. The ratio of one hundred or more matings per conception argues for remarkable inefficiency in otherwise very well adapted animals if the sole purpose of mating is to exchange sperm. Instead, mating fosters relationships. While this realization is comforting to readers of teenage romance novels, it also empowers same-sex mating. If the purpose of mating often is solely to build relationships, and not to transfer sperm, then mating with genital-genital contact can take place between any two animals who need to build a relationship. Like sharing food and sharing grooming, sharing the pleasure of genital contact is a reciprocating behavior with social function.

So, sexuality is a component of an animal's social life. What about sexual orientation? The important book by Bruce Bagemihl, a scholar with a PhD in linguistics, has opened new vistas in zoology. Bagemihl assembled citations of more than three hundred instances of same-sex sexuality among vertebrates that have been reported in the primary biological literature.¹ Prior to his book, I had assembled only about fifty cases. Three hundred is a big number, but it is almost surely

an underestimate, given the difficulty of ascertaining that a same-sex mating is taking place. Homosexuality has been studied in detail in a dozen or so species. Although gay and lesbian scholars are generally aware of some homosexuality in animals, the biological sciences community is not; it has blissfully assumed the naturalness and normality of exclusive heterosexuality.

Meanwhile, the evolutionary question concerning homosexuality is not, I feel, whether homosexuality is natural and adaptive (yes) but what determines the ratio between homosexual and heterosexual orientations—what biologists call a polymorphism—and how homophobia can be seen as a natural and evolved component of the homosexual-heterosexual dynamic.

As for transgendered animals, the term *transgender* does not readily apply. Even among people, I am not confident that the terms *transgender* and *transsexual* will last very long. Although women-identifying male-bodied people and men-identifying female-bodied people have existed cross-culturally throughout history, each culture has its own institutional means of housing them, some egalitarian, others repressive. The present-day “trans” category may, nonetheless, prove a longer-lasting identity than gay and lesbian identities, because gender-variant categories seem to persist longer in history than sexual orientation categories. Among animals, too, there is no shortage of masculine females—female birds and mammals with male “ornaments”—and no shortage of feminine males with female coloration and courtship moves. Many animal social systems support transgender expressions in this sense. Moreover, membership in an animal “gender” is not necessarily static, and transitions occur by, say, males of one gender changing to another gender as they grow older.

From this perspective, gender consists as much of material as of performance. They go together. A play depends both on the acting and on the stage props. Minimalist theater productions reduce almost entirely to performance, whereas lavish productions may call for props and costumes that overshadow the acting, but such productions are communicative nonetheless. Animal bodies speak body language. To a biologist, bodies are not static; they are molded by natural selection, which itself reflects pressures that reside in an animal society. Over evolutionary time, animals come to have the bodies that enable their performance, in a slow, reciprocal back-and-forth between props and acting, as though the actors were assembling the set during the play. Moreover, an animal may mold its body by accumulating colors from the environment, as well as by scraping its bill and claws. Animals feather their nests with materials gathered from the environment and morph their surroundings and their self-presentation with their equivalent of technology. So, the body morphing of transgendered people in cultures such as

ancient Rome, India, and the West is but a natural way for humans in those cultures to have realized their gender identities.

The interesting issue, to me, is not why people should do something like genital body morphing. The issue is why this should seem so sensational. The transgender cultures of two-spirits in Native America and of mahu in Polynesia do not feature body morphing of genitals. There, gender seems to reside in occupation, not body. To be a woman means doing certain things, not having a certain body. In contrast, the Indo-European cultures connect gender with body, and to be a woman means acquiring a certain body. In any culture, people do what they must to realize their identity. The realization of identity goes far beyond gender; after all, many volunteer to die for their country, their religion, or some other cause that gives them their identity. Do we list patriotic heroes who give their lives for their country in the *Diagnostic and Statistical Manual of Mental Disorders (DSM)* as people afflicted with a life-threatening mental disease? Perhaps we should, and at the same time remove transgendered people from the *DSM*, because soldiers are dangerous, whereas transgendered people are not.

Note

1. Bruce Bagemihl, *Biological Exuberance: Animal Homosexuality and Natural Diversity* (New York: St. Martin's, 1999).

Uneasy Alignments, Resourcing Respectable Subjectivity

Beverley Skeggs

The case has been well made for a recent shift to what Jon Dovey identifies as “extraordinary subjectivity,” that is, a shift from grand narratives as the bases of truth claims to statements that the world no longer has meaning unless grounded in the personal, the subjective, and the particular. Lauren Berlant calls this grounding process “intimate citizenship,” and Nick Rose writes about “governing the soul.”¹ The impetus for this imperative to subjectivity has been variously linked to the rise in the “psy” sciences, the extension of “expertise” into work practices and the everyday vocabulary of popular culture, and the unrelenting capitalist desire for profit from new consumer practices—a desire that generates new forms of marketing, such as “emotional branding” and the search for “the soul of the new consumer.”² The imperative to display subjectivity can also be seen in new forms of neoliberal governance, which embody the contradiction that collective-minded citizens are simultaneously self-interested consumers and which thus produce what