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Has Sex Been Redefined?

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Abstract

Has science really shown that there are more than two sexes? Is it really time to redefine sex? A well-known article claims just that. In this short essay, I respond and show that there is nothing particularly surprising about these scientific data on sex, and that people with a traditional, binary definition of sex should not be moved by the data to change their view.

In 2015, Claire Ainsworth published an article with the bold title 'Sex Redefined' (*Nature* 518 (2015), 288–91). In it, she mostly reported on what she, and the scientists she quoted, seemed to think was a growing scientific consensus that recent discoveries in biology had, for the first time, prompted us to challenge a pre-existing consensus that there were only two sexes.

Yet in his monumental *City of God*, written over the course of at least a decade beginning around the year 413, St Augustine wrote the following:

> [some] have the characteristics of both sexes, the right breast being male and the left female, and in their intercourse they alternate between begetting and conceiving … However, it is clear what constitutes the persistent norm of nature in the majority, and what, by its very rarity, constitutes a marvel … As for Androgynes, also called Hermaphrodites, they are certainly very rare, and yet it is difficult to find periods when there are no examples of human beings possessing the characteristics of both sexes, in such a way that it is a matter of doubt how they should be classified … Now it cannot be denied that these derive ultimately from that one man; and therefore the same is true of all those races which are reported to have deviated as it were, by their divergence in bodily structure, from … practically the whole of mankind. If these races are included in the definition of 'human', that is, if they are rational and mortal animals, it must be admitted that they trace their lineage from that same one man, the first father of all mankind. (Augustine, *City of God*, 16.8, trans. Henry Bettenson (Harmondsworth: Penguin, 2003), 661–3)

I quote this passage here because it serves to illustrate that the awareness of intersex people is not new to long-standing traditions of thought, and that such awareness was not thought to present any great difficulty to a more traditional position on sex and gender, debates to which in any case Augustine also contributed enormously.

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that advances in biology or medical science have made us aware, for the first time, of the really hard cases. Indeed, the really hard cases are precisely the most widely and earliest known. But then how is it that someone could hold what I will call (for lack of a better word) a more traditional view about sex in the face of all the data presented by Ainsworth's article? I'll attempt to explain this first by detailing what I take to be a 'traditional' perspective on sex. At the moment, I'm attempting to discuss the term 'sex' as a condition of people, rather than as an act. Here goes.

For folks with a more traditional take on sex, sex is not the same thing as gender, though the two are related in various ways. Gender, for such folks, might refer to socially mandated or prescribed behaviours or norms that position one, socially, as masculine or feminine. No one seriously disputes that a man (don't worry about what we *mean* by 'man' just yet) could take on socially constructed 'feminine' attributes (however erroneously these are often labelled) or that a woman could take on socially constructed 'masculine' attributes without *becoming* a woman or a man respectively. I tear up a lot, I'm not usually particularly aggressive, and I like to wear pastels. None of these are, in this cultural moment, particularly masculine attributes, but none of this means I'm not a man (or that I don't identify as such). So, for these folks, sex is distinct from gender. What, then, is sex?

For folks with a more traditional take on sex, one's 'sex' has primarily to do with how one is positioned with regard to the potential for reproduction. We tacitly see this recognition in our way of talking and in Ainsworth's article itself when she discusses 'secondary sexual characteristics such as breasts or facial hair' (289). The obvious question is: secondary in relation to what? Naturally, the *primary* sexual characteristics. These would get more and more primary the closer one gets to the potential an individual might have for reproduction. But, of course, the penis is not fully primary in that sense, since it serves to ejaculate, in the right circumstances, something that is still more primary in that sense than it, namely, semen. And semen

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carries with it things that are still more primary than it, namely, spermatozoa, the male gametes. Now the traditional position I'm beginning to discuss will claim that sex is basically dimorphic (i.e. it has two forms, or *morphai*). There are interesting objections to that claim which I'll discuss below, but for now let's notice what in any event cannot be terribly controversial: gametes *are* dimorphic. There are spermatozoa and oocytes, or ova. There are just two of those, and far and away most people, far and away most of the time, produce at most one of them.

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So, sex *cells*, or gametes, are dimorphic. There can be various malformations of the sex cells themselves, but you can't take a malformed sperm and pair it with a well-formed sperm and expect some new organism to result. A malformed sperm isn't another type of gamete; it's just a malformed sperm that either won't pair with an ovum and make a new organism or it will (in which case it is, precisely to that degree, a well-formed sperm). Likewise, while you might be able theoretically (we're not there yet) to take an enucleated ovum and the genetic material of a human derived from a suitably modified somatic cell and get what would basically be an identical twin to the original human from whom you derived the somatic cell, you can't do that with two ova. The coming together of two ova that developed with anything like the normal process of gametogenesis (that is, without you doing lots of things in a lab on purpose with other ingredients and technology we don't have) will not result in another organism.

But even if sex *cells* are dimorphic, isn't the point of Ainsworth's article to show that sex itself is not dimorphic? Isn't that just science? Well, yes, that does seem to be the point of the article. But whether it's successful is going to depend on what we mean by sex. In this case, what we have to mean is the sex of any particular individual human being. But what does *that* mean? In general, again, for those traditional folks, it means what pole one occupies with regard to the potential for reproduction. So, other things being equal, if you produce sperm, you're male. Other things being equal, if you produce ova, you're female. But again, the objector says, 'the point of the article is to show that other things aren't equal! There are lots of "differences or disorders of sex development" [DSDs] (288) that make it difficult to position someone on either of those poles!'

How might traditional folks respond to this objection? They'd begin by noticing that the objection presupposes less of a kaleidoscope and more of a linear progression. That is, the objection presupposes that there *are* two poles (male and female; sperm-producing and ovum-producing) but that some folks differ in how near they are to one or the other pole. The next thing those traditional folks might notice is just what sorts of cases are being proffered to suggest that sex is not dimorphic. Let's take the first one on the first page, for example. Here is that case:

> A 46-year-old pregnant woman had visited [Paul James's] clinic at the Royal Melbourne Hospital in Australia to hear the results of an amniocentesis test to screen her baby's chromosomes for abnormalities. The baby was fine – but follow-up tests had revealed something astonishing about the mother. Her body was built of cells from two individuals, probably from twin embryos that had merged in her own mother's womb. And there was more. One set of cells carried two X chromosomes, the

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> complement that typically makes a person female; the other had an X and a Y. Halfway through her fifth decade and pregnant with her third child, the woman learned for the first time that a large part of her body was chromosomally male. (288)

While I certainly agree that 'sex can be more complicated than it at first seems' (288), I submit that this particular case should leave a person with a more traditional viewpoint on sex entirely unperturbed.

While the article suggests that the presence or absence of a Y chromosome is 'the simple scenario' of one's sex, nothing like that would have been the concern of, say, the Christian (or mainstream Jewish or Muslim) tradition for most of its (or their) millennia-old tradition(s). Most of them had never heard of chromosomes. What they would have cared about is what pole a person occupied in relation to the potential for reproduction and there is simply no ambiguity here in the case given above. The woman has conceived three children and given birth to two; she produces oocytes and not spermatozoa; she is a woman (for those traditional types, at any rate).

As the article goes on to note, it is now commonplace to say that 1 in 100 people has some DSD or other. But what are some of these DSDs? Here are some of them from the article:

1. CAH (congenital adrenal hyperplasia) causes 'excessive amounts of male sex hormones' in XX individuals. Among the symptoms of the most extreme cases are an 'enlarged clitoris and fused labia that resemble a scrotum' (290). But milder (and thus more common) cases of CAH, which may affect as many as 1 in 1,000 people, may result in more 'male-like facial and body hair, irregular periods or fertility problems' (290).
2. Some suggest that hypospadias is a case of a DSD, a case in which the urethra opens on the underside of the penis rather than at its distal end (290). Ainsworth's article classifies this as a 'moderate variation' rather than a 'subtle variation' (290).
3. Ainsworth notes that some men retain maternal cells in their blood and that women who have been pregnant with male children retain some male cells in their body (290).
4. 'The Sex Spectrum' line on the top of the last two pages of Ainsworth's article gives 'moderate' variations that include 'premature shutdown of ovaries' and 'subtle' variations that include 'excess male hormones' or polycystic ovarian syndrome (291).

There are genuinely hard cases concerning how to position folks who identify as intersex, but these don't seem to me to be those. I suspect the traditionalist would, without much difficulty, identify the first as female, the second as male, the third as male or female as the case may be and as the very description of the case already shows, and the fourth as female. Fertility problems are not the same thing, to those traditional folks, as an ambiguous sex.

That's not to say that there aren't hard cases where it concerns identifying an individual's sex, even from a traditional standpoint. But those cases are exceedingly rare, as the article itself makes clear. Ultimately, the cases are hard when an individual suggests no particular sex and when an individual suggests both sexes. But it's actually impossible to have zero by way of an orientation of one's body towards the possibility of reproduction even if one can't actually reproduce, since some aspects of male/female sex characteristics are mutually exclusive and mutually exhaustive (e.g. one either has external testes or one doesn't, etc.). In any event Ainsworth doesn't point much in the direction of folks with neither male nor female sex characteristics. She points much more in the direction of folks with both.

What are the key cases there? Two seem the most salient. The first is the case of CAIS, or Complete Androgen Insensitivity Syndrome, and the second is the case of someone with an ovotesticular DSD. In any event, the relevant case is one where the patient presents with aspects of both male and female sexual organs. My sense of CAIS is that subjects with this DSD tend to present more or less as female but have an XY chromosomal structure. But

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much as one might expect, there is PAIS (or Partial Androgen Insensitivity Syndrome). PAIS, as the name suggests, has several grades to it. What with PAIS having to do with the relative 'severity of androgen resistance' one will find grades of this along a spectrum, and these grades will generally be closer and closer to, and further away from, phenotypically male or phenotypically female, but many in this category will present with aspects of each (see Alfonsa Pizzo, et al., 'Complete Androgen Insensitivity Syndrome: A Rare Case of Disorder of Sex Development', *Case Reports in Obstetrics and Gynecology* (2013), DOI: https://doi.org/10.1155/2013/232696). Moreover, there are, as Ainsworth tells us, 'rare reports of predominantly XY people [this is a case of a person with an ovotesticular DSD] conceiving and bearing a healthy child' (291).

So, is sex a 'spectrum'? Well, yes and no, the traditionalist might say. Sex itself is not a spectrum in the sense that there are two poles that have to do with reproduction, namely, sperm-producing, and ovum-producing. In that sense it is difficult to see why the traditionalist would be very interested in the idea that there are more *sexes* than two. There are still only two poles that people can occupy where it concerns reproduction in the sense that human beings only produce two gametes. But sex *is* a thing that human beings imperfectly embody, and that embodying does seem to present along a spectrum. As the Aristotelian tradition would have it, the material individuals often imperfectly exhibit the form of the thing. How could that be surprising to a traditionalist, however?

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There might be an interesting question of whether some people could occupy aspects of both poles (though no one can exhibit this completely in regard to full complements of primary and secondary sex characteristics). But even that isn't a reason to think there are more than two poles; it's just a reason to doubt whether the two are mutually exclusive. All that means is that if the way sex is imperfectly embodied presents along a spectrum, the spectrum is not like, say, the visible colour spectrum, since with that we clearly identify at least seven distinct colours. The way that sex is embodied along a spectrum is a bit more like the question of whether I am bald or not. As Tomas Bogardus writes, responding to another writer on these questions, it 'is

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incorrect to say that it's part of the folk view of human biological sex that everyone falls "neatly and easily" into one or the other sex category, just as it's no part of the folk view of "bald" that anyone you choose falls "neatly and easily" into the bald or the non-bald camp. An astonishing number of our concepts allow for borderline cases' (Bogardus, 'Evaluating Arguments for the Sex/Gender Distinction', *Philosophia* 48 (2020), 873–92, at p. 883). There's no reason why folks with a traditional view, like St Augustine, need to be unaware of these facts.

What does that mean for our question? Someone's urethra opens at the underside of the penis but they're male. Someone has PCOS but they're female. Someone has one set of genital equipment but they don't produce gametes. Still male or female as the case may be. Someone presents phenotypically as female but has a 'short blind ending vagina' and immature gonads in the abdominal cavity and learns with great dismay that hormone therapy will not succeed in allowing her to gestate children. But she's still female, or so it seems to me (and did to her in the relevant case study) (see Pizzo, et al., 'Complete Androgen Insensitivity Syndrome').

Now you might think, 'fine. Most people are clearly male and clearly female, but some folks' sex isn't as clear. So why do we even need this concept of sex? Aren't we just people?' To answer this question let's bracket any moral and religious questions at stake here (though for many there clearly are such questions). There are nevertheless medical and social questions that are greatly helped by answers as to whether one is male or female. For example, who needs to be screened for prostate cancer, breast cancer, ovarian cancer, or testicular cancer? For whom would we regard the lack of menstruation at the age of, say, 20, to be a healthy condition? The list goes on. There are innumerable medical ways in which the fact that men have one set of medical concerns and women have another is highly useful.

But it is also an important social reality. For example, at least in the United States and in the pre-*Obergefell* world of 2015, many scientists were quite busy with the question of the origin of sexual orientation. David Myers, a well-known psychologist who has defended gay rights causes at length, for example, has a useful little article called 'Most Are Straight, Some Are Gay, and Why it is That Way' (*Modern Believing* 55 (2014), 127–39). But to be heterosexual is to be attracted to members of the opposite sex, often enough with an interest in procreating through this relationship, and, on Myers's reading, most people are that way (at least in the first respect). Indeed, to be homosexual is to be attracted to members of the same sex, and some folks are that way. Moreover, the position, in the pre-*Obergefell* world, seemed to be that such an orientation (heterosexual or homosexual, notwithstanding a small amount of fluidity among males and a somewhat greater degree of fluidity among females) was mostly fixed. This means that, to the great majority of human beings, the sex of one's erotic partner matters. So, we need the concept of sex, and for the most part, we need its dimorphism. The only cases in which the dimorphism could be challenged are ones where people have some portion of the usual complement of both sexes. We don't have cases of unsexed people; we just have a small number of folks with more or less ambiguous genitalia, and it's not clear what St Augustine or other traditional folks would have found surprising about that. Accordingly, to call for a 'redefinition' of sex seems unwarranted by the data cited in Ainsworth's article.

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