Orgasm, Generation, and the Politics of Reproductive Biology

Sometime in the late eighteenth century human sexual nature changed, to paraphrase Virginia Woolf. This essay gives an account of the radical eighteenth-century reconstitution of female, and more generally human, sexuality in relation to the equally radical Enlightenment political reconstitution of “Man”—the universalistic claim, stated with starkest clarity by Condorcet, that the “rights of men result simply from the fact that they are sentient beings, capable of acquiring moral ideas and of reasoning concerning these ideas. [And that] women, having these same qualities, must necessarily possess equal rights.”

Condorcet moves immediately to biology and specifically to reproductive biology. Exposure to pregnancy, he says, is no more relevant to women’s political rights than is male susceptibility to gout. But of course the facts or supposed facts of female physiology were central to Condorcet, to Mill, to feminists as well as antifeminists, to liberalism in its various forms and also to its enemies. Even the political pornography of Sade is grounded in a theory of generation. The body generally, but especially the female body in its reproductive capacity and in distinction from that of the male, came to occupy a critical place in a whole range of political discourses. It is the connection between politics and a new disposition of male and female that concerns me here.

Near the end of the century of Enlightenment, medical science and those who relied upon it ceased to regard the female orgasm as relevant to generation. Conception, it was held, could take place secretly, with no tell-tale shivers or signs of arousal. For women the ancient wisdom that “apart from pleasure nothing in mortal kind comes into existence” was uprooted. We ceased to regard ourselves as beings “compacted in blood, of the seed of man, and the pleasure that [comes] with sleep.” We no longer linked the loci of pleasure with the mysterious infusing of life into matter. Routine accounts, like that in a popular Renaissance midwifery text of the clitoris as that organ “which makes women lustful and take delight in copulation,” without which they “would have no desire, nor delight, nor would they ever conceive,” came to be regarded as controversial if not manifestly stupid.

Sexual orgasm moved to the periphery of human physiology. Previously a deeply embedded sign of the generative process—whose existence was no more open to debate than was the warm, pleasurable glow that usually accompanies a good meal—orgasm became simply a feeling, albeit an enormously charged one,
whose existence was a matter for empirical inquiry or armchair philosophizing. Jacques Lacan's provocative characterization of female orgasm, "la jouissance, ce qui ne sert a rien," is a distinctly modern possibility.4

The new conceptualization of the female orgasm, however, was but one formulation of a more radical eighteenth-century reinterpretation of the female body in relation to that of the male. For several thousand years it had been a commonplace that women have the same genitals as men, except that, as Nemesisius, bishop of Emesa in the sixth century, put it: "Theirs are inside the body and not outside it." Galen, who in the second century A.D. developed the most powerful and resilient model of the homologous nature of male and female reproductive organs, could already cite the anatomist Herophilus (third century B.C.) in support of his claim that a woman has testes with accompanying seminal ducts very much like the man's, one on each side of the uterus, the only difference being that the male's are contained in the scrotum and the female's are not.5

For two millennia the organ that by the early nineteenth century had become virtually a synecdoche for woman had no name of its own. Galen refers to it by the same word he uses for the male testes, orchis, allowing context to make clear with which sex he is concerned. Regnier de Graaf, whose discoveries in 1672 would eventually make the old homologies less plausible, continues to call the ovaries he is studying by their old Latin name, testiculi. A century later the Montpelierian physiologist Pierre Roussel, a man obsessed with the biological distinctiveness of women, notes that the two oval bodies on either side of the uterus "are alternatively called ovaries or testicles, depending on the system which one adopts." As late as 1819, the London Medical Dictionary is still somewhat muddled in its nomenclature: "Ovaria: formerly called female testicles; but now supposed to be the receptacles of ova or the female seed." Indeed, doggerel verse of the nineteenth century still sings of these hoary homologies after they have disappeared from learned texts:

... though they of different sexes be,
Yet on the whole they are the same as we,
For those that have the strictest seachers been,
Find women are but men turned outside in.

By 1800 this view, like that linking orgasm to conception, had come under devastating attack. Writers of all sorts were determined to base what they insisted were fundamental differences between male and female sexuality, and thus between man and woman, on discoverable biological distinctions. In 1803, for example, Jacques Moreau de la Sarthe, one of the founders of "moral anthropology," argued passionately against the nonsense written by Aristotle, Galen, and their modern followers on the subject of women in relation to men.6 Not only are the sexes different, they are different in every conceivable respect of body and soul, in every physical and moral aspect. To the physician or the naturalist the relation

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of woman to man is "a series of oppositions and contrasts." Thus the old model, in which men and women were arrayed according to their degree of metaphysical perfection, their vital heat, along an axis whose telos was male, gave way by the late eighteenth century to a new model of difference, of biological divergence. An anatomy and physiology of incommensurability replaced a metaphysics of hierarchy in the representation of women in relation to men.7

But neither the demotion of female orgasm nor the biology of incommensurability of which it was a part follow simply from scientific advances. True, by the 1840s it had become clear that, at least in dogs, ovulation could occur without coition and thus presumably without orgasm. And it was immediately postulated that the human female, like the canine bitch, was a "spontaneous ovulator," producing an egg during the periodic heat that in women was known as the menses. But the available evidence for this half truth was at best slight and highly ambiguous. Ovulation, as one of the pioneer twentieth-century investigators in reproductive biology put it, "is silent and occult: neither self-observation by women nor medical study through all the centuries prior to our own era taught mankind to recognize it." Indeed until the 1930s standard medical advice books recommended that to avoid conception women should have intercourse during the middle of their menstrual cycles—i.e., during days twelve through sixteen, now known as the period of maximum fertility. Until the 1930s even the outlines of our modern understanding of the hormonal control of ovulation were unknown. Thus, while scientific advances might in principle have caused a change in the understanding of the female orgasm, in fact the reevaluation of pleasure occurred a century and a half before reproductive physiology came to its support.8

The shift in the interpretation of the male and female body, however, cannot have been due, even in principle, primarily to scientific progress. In the first place the "oppositions and contrasts" between the female and the male have been self-evident since the beginning of time: the one gives birth and the other does not, to state the obvious. Set against such momentous truths, the discovery, for example, that the ovarian artery is not, as Galen would have it, the homologue of the vas deferens is of relatively minor significance. Thus, the fact that at one time male and female bodies were regarded as hierarchically, that is vertically, ordered and that at another time they came to be regarded as horizontally ordered, as opposites, as incommensurable, must depend on something other than one or even a set of real or supposed "discoveries."

In addition, nineteenth-century advances in developmental anatomy (germ-layer theory) pointed to the common origins of both sexes in a morphologically androgenous embryo and thus not to their intrinsic difference. Indeed the Galenic homologies were by the 1850s reproduced at the embryological level: the penis and the clitoris, the labia and the scrotum, the ovary and the testes shared common origins in fetal life. Finally, and most telling, no one was very interested in looking at the anatomical and concrete physiological differences between the

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sexes until such differences became politically important. It was not, for example, until 1797 that anyone bothered to reproduce a detailed female skeleton in an anatomy book so as to illustrate its difference from the male. Up to this time there had been one basic structure for the human body, the type of the male.9

Instead of being the consequence of increased scientific knowledge, new ways of interpreting the body were rather, I suggest, new ways of representing and indeed of constituting social realities. As Mary Douglas wrote, “The human body is always treated as an image of society and . . . there can be no natural way of considering the body that does not involve at the same time a social dimension.” Serious talk about sexuality is inevitably about society. Ancient accounts of reproductive biology, still persuasive in the early eighteenth century, linked the experiential qualities of sexual delight to the social and indeed the cosmic order. Biology and human sexual experience mirrored the metaphysical reality on which, it was thought, the social order too rested. The new biology, with its search for fundamental differences between the sexes and its tortured questioning of the very existence of women’s sexual pleasure, emerged at precisely the time when the foundations of the old social order were irremediably shaken, when the basis for a new order of sex and gender became a critical issue of political theory and practice.10

The Anatomy and Physiology of Hierarchy

The existence of female sexual pleasure, indeed the necessity of pleasure for the successful reproduction of humankind, was an unquestioned commonplace well before the elaboration of ancient doctrines in the writings of Galen, Soranus, and the Hippocratic school. Poor Tiresias was blinded by Juno for agreeing with Jove that women enjoyed sex more than men. The gods, we are told in the Timaeus, “contrived the love of sexual intercourse by constructing an animate creature of one kind in us men, and another in women”; only when the desire and love of the two sexes unite them are these creatures calmed. Galen’s learned texts, On the Seed and the sections on the reproductive organs in On the Usefulness of the Parts of the Body, are intended not to query but rather to explain the obvious: “why a very great pleasure is coupled with the exercise of the generative parts and a raging desire precedes their use.”11

Heat is of critical importance in the Galenic account. It is, to begin with, the sign of perfection, of one’s place in the hierarchical great chain of being. Humans are the most perfect of animals, and men are more perfect than women by reason of their “excess of heat.” Men and women are, in this model, not different in kind but in the configuration of their organs; the male is a hotter version of the female, or to use the teleologically more appropriate order, the female is the cooler, less perfect version of the male.12

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Understanding the machinery of sex thus becomes essentially an exercise in topology: "Turn outward the woman's, turn inward, so to speak, and fold double the man's, and you will find the same in both in every respect." Galen invites his readers to practice mentally the admittedly difficult inversions.

Think first please, of the man's [external genitalia] turned in and extending inward between the rectum and the bladder. If this should happen, the scrotum would necessarily take the place of the uterus with the testes lying outside, next to it on either side.

The penis in this exercise becomes the cervix and vagina; the prepuce becomes the female pudenda and so forth, continuing on through the various ducts and blood vessels. Or, he suggests, try it backwards:

Think too, please, of the converse, the uterus turned outward and projecting. Would not the testes [ovaries] then necessarily be inside it? Would it not contain them like a scrotum? Would not the neck [the cervix], hitherto concealed inside the perineum but now pendant, be made into the male member?13

In fact, Galen argues, "You could not find a single male part left over that had not simply changed its position." And, in a blaze of rhetorical virtuosity, he elaborates a stunning and unsuspected simile to make all this more plausible: the reproductive organs of women are like the eyes of the mole. Like other animals' eyes, the mole's have "vitreous and crystalline humors and the tunics that surround [them]"; yet, they do not see. Their eyes do not open, "nor do they project but are left there imperfect." Likewise, the womb itself is an imperfect version of what it would be were it projected outward. But like the eyes of a mole, which in turn "remain like the eyes of other animals when these are still in the uterus," the womb is forever as if still in the womb!14

If the female is a replica of the male, with the same organs inside rather than outside the body, why then, one might ask, are women not men? Because they have insufficient heat to extrude the organs of reproduction and, as always for Galen, because form befits function. Nature in her wisdom has made females cooler, allowing their organs to remain inside and providing there a safe, guarded place for conception and gestation. Moreover, if women were as hot as men, semen planted in the womb would shrivel and die like seed cast upon the desert; of course, the extra nutriment needed by the fetus would likewise burn off. The fact remains that women, whatever their special adaptations, are but variations of the male form, the same but lower on the scale of being and perfection.15

In this model, sexual excitement and the "very great pleasure" of climax in both men and women are understood as signs of a heat sufficient to concoct and conmingle the seed, the animate matter, and create new life. Friction heats the body as it would two objects rubbing together. The chafing of the penis, or even its imagined chafing in a nocturnal emission, warms the male organ and, through its connections to veins and nerves, every other part of the body. As warmth and
Figure 1. Leonardo develops homologies between male and female reproductive organs. The testicles are clearly homologies of the ovaries. But the uterus is not depicted as homologue of the scrotum; instead, the loop of the vas deferens to the testes encloses a space corresponding to the hollow mass of the uterus. From Leonardo da Vinci on the Human Body, ed. Charles D. O’Malley and J. B. de C. M. Saunders (New York, 1952), plate 201.
pleasure build up and diffuse, the increasingly violent movement of the whole man causes the finest part of the blood to be concocted into semen, a kind of foam that finally bursts forth powerfully and uncontrollably like an epileptic seizure, to use the analogy Galen borrowed from Democritus.\textsuperscript{16}

In women, the rubbing of the vagina and the neck of the womb performs the same function though, some writers would argue, with a somewhat different rhythm of delight. The author of the Hippocratic treatise The Seed maintains, for example, that heat in women builds up more gradually, resulting in a pleasure at once more sustained and less intense than the male's. Though her orgasm occurs whether she emits before or after the man, it is most intense if it occurs at the moment the sperm and its heat touches the womb. Then, like a flame flaring when wine is sprinkled on it, the woman's heat blazes most brilliantly. The nuances of the orgasm thus represent the inner workings of the body as well as the cosmic order of perfection. Orgasm’s crescendo bears witness to the Galenic-Hippocratic two-seed model of conception in which women, contra Aristotle, actually “seminate” at the peak of their sexual raptures. Like men, women also give forth their semen in response to imaginary friction in the heat of youth or in the quiet of the night. The limbs and back of a widow who had not been with a man for some time ache, Galen reports, from the build-up of semen until she discharges a viscous semen and feels the kind of physical pleasure she would have experienced in intercourse. Others, similarly situated, discharge a thinner, more urine-like liquid—one presumes the secretion of the paraurethral glands.\textsuperscript{17}

Galen elaborates metaphors linking friction, chafing, and itching with the production of the generative substance in considerable detail. Semen, in addition to being the product of genital heat, is also thought to produce specific local effects. Its fluid parts constitute an acrid humor that accumulates under the skin and causes an itch that, he reminds his readers, is enormously pleasurable to relieve. Avicenna, through whose widely influential \textit{Canon} Galen came to be known in the medieval West, elaborates this image even further: an “itching,” a “pruritus” in the mouth of the womb, accompanied by its inflammation or erection, are taken to be the physical signs in women of the desire for intercourse. The skin of the genital area, Galen argues, is more sensitive than other skin, the desire to scratch it more vehement, and the resulting pleasure more intense. Finally, semen as a local irritant during coition opens up and straightens the mouth of the womb, making it receptive to the male semen.\textsuperscript{18}

Like a great steam generator, the whole body warms up to produce the seed; the sensations of intercourse and the orgasm itself indicate that everything is working as it should. But in this model sexual pleasure is not specifically genital, despite the fact that intercourse is viewed as the relieving of a localized itch and the organs of copulation as sources, through friction, of heat. Orgasm’s warmth, though more vehement and exciting, is in kind no different from other warmth and can be produced in some measure by food, wine, or the power of imagination.
Ancient medicine bequeathed to the Renaissance a physiology of flux and corporeal openness, one in which blood, mother's milk, and semen were fungible fluids, products of the body's power to concoct its nutriment. Thus, not only could women turn into men, as writers from Pliny to Montaigne testified (see below), but bodily fluids could turn easily into one another. This not only explained why pregnant women, who, it was held, transformed food into nourishment for the fetus, and new mothers, who transformed the catamenial elements into milk, did not menstruate; it also accounted for the observation that obese women, who transformed the normal plethora into fat, and dancers, who used up the plethora in exercise, did not menstruate either and were thus generally infertile. Menstrual blood and menstrual bleeding were, moreover, regarded as no different than blood and bleeding generally. Thus Hippocrates views nosebleed and the onset of menstruation as equivalent signs of the resolution of fevers. A woman vomiting blood will stop if she starts to menstruate, and it is a good sign if epistaxis occurs in a woman whose courses have stopped. Similarly, bleeding in men and in women is regarded as physiologically equivalent. If melancholy appears “after the suppression of the catamenial discharge in women,” argues Aretaeus the
Cappadocian, "or the hemorrhoidal flux in men, we must stimulate the parts to throw off their accustomed evacuation." 19

Indeed, the menses, until one hundred years before its phantasmagoric nineteenth-century interpretations by Michelet and others, was still regarded, as it had been by Hippocrates, as but one form of bleeding by which women rid themselves of excess materials. Brazilian Indian women "never have their flowers," writes an eccentric seventeenth-century English compiler of ethnographic curiosities, because "maids of twelve years old have their sides cut by their mothers, from the armpit down unto the knee . . . [and] some conjecture they prevent their monthly flux in this manner." Albrecht von Haller, the great eighteenth-century physiologist, argues that in puberty the plethora "in the male, vents itself frequently through the nose . . . but in the female the same plethora finds a more easy vent downward." Herman Boerhaave, the major medical teacher of the generation before Haller, cites a number of cases of men who bled regularly through the hemorrhoidal arteries, the nose, or the fingers or who, if not bled prophylactically, developed the clinical signs, the tenseness of the body, of amenorrhea. Even the enlightened Frederick the Great had himself bled before battle to relieve tension and facilitate calm command. 20

The fungibility of fluids thus represented in a different register the anatomical homologies described earlier. The higher concoction of male semen with respect to that of the female and the fact that males generally rid themselves of nutritional excesses without frequent bleeding bore witness both to the essential homology between the economies of nutrition, blood, and semen in men and women, and to the superior heat and greater perfection of the male. Sexual heat was but an instance of the heat of life itself, and orgasm in both sexes the sign of warmth sufficient to transform one kind of bodily fluid into its reproductively potent forms and to assure a receptive place for the product of their union. In this context, it is not difficult to see why Galen's clinical judgments on the relationship between pleasure and fertility, or between the absence of pleasure and barrenness, should have become commonplace in both learned and popular Renaissance medical literature.

Avicenna, the eleventh-century Arab writer who served as a conduit to the West for much ancient medicine, writes in some detail of how a woman may not "be pleased by" the smallness of her mate's penis "wherefore she does not emit sperm; and when she does not emit sperm a child is not made." "Pleasure induces a hasty emission of sperm"; conversely, if women delay in emitting "and do not fulfill their desire . . . the result is no generation." The midwife and physician Trotula in the twelfth century describes how barrenness can well be the sad consequence of too little or too much heat, though she does not distinguish sexual heat from its more mundane varieties. Of course, it is argued in a great body of Renaissance literature that barrenness might well be due to anatomical defects and arguably to witchcraft, but either a lack of passion or an excess of

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lust had to be considered in any differential diagnosis. In men, insufficient heat manifested by a lack of sexual desire could be remedied by rubbing the loins with heat-producing drugs. Still other drugs—in addition to lascivious talk, coquetry, and the like—could cure "defect of spirit," the inability to have an erection when desire was present. In women adversity and indisposition "to the pleasures of the lawful sheets" or "no pleasure and delight" in intercourse, along with a slow pulse, little thirst, thin urine, scant pubic hair, and similar signs, were almost certain indicators of insufficient heat of the testicles to concoct the seed. As Jacob Rueff puts it in discussing the problem of cold, "The fruitfulness of man and wife may be hindered very much for want of desire to be acquainted with Venus." Conversely, too much desire (prostitutes were thought seldom to conceive); curly, dark, and plentiful hair (marks of the virago, the virile, unnaturally warm woman); a short or absent menses (the hot body burning off the excess materials that in normal women were eliminated through the monthly courses) indicated excessive heat, which will consume or shrivel up the seed.21

Thus, to ensure "generation in the time of copulation," the right amount of heat, made manifest by normal sexual pleasure and in the end by orgasm, must be produced. Talk and teasing, several books suggest, were the first resort. Women
should be prepared with lascivious words, writes John Sadler, having pointed out earlier the importance of mutual orgasm; sometimes the problem is neither the womb nor other impediments in either spouse, except only in the manner of the act as when in the emission of the seed, the man is quicke and the woman too slow, whereby there is not a concourse of both seeds at the same instant as the rules of conception require.

He further recommends wanton behavior, “all kinde of dalliance” and “allurement to venery.” Then, if the man still found his mate “to be slow, and more cold, he much cherish, embrace, and tickle her.” He must handle her secret parts and dugs, that she may take fire and be enflamed in venery, for so at length the wombe will strive and waxe fervent with desire of casting forth its own seed, and receiving the man’s seed to be mixed together therein.

The womb, as another writer notes almost a century later, “by Injoyment Naturally receives Seed for Generation . . . as Heat [attracts] Straws or Feathers.” Be careful, warn Ambroise Pare and others, not to leave a woman too soon after her orgasm, “lest aire strike the open womb” and cool the seeds so recently sown. If all this fails, the Renaissance pharmacopoeia was full of useful drugs that worked either directly or by sympathetic magic. Pare recommends “fomenting her secret parts with a decoction of hot herbes made with muscadine, or boiled in other good wine,” and rubbing civet or muske into the vagina. Submerge the privates in a warm sitz bath of junipers and chamomile, advises another authority. The heart of a male quail around the neck of a man and the heart of
a female around the neck of a woman were said to enhance love, presumably because of the lecherous character of birds generally and perhaps of quails in particular; a concoction of ale hoof and pease straw was also indicated.23

In the Renaissance, as in late antiquity, an unbreakable bond between orgasm and fulfillment of the command to be fruitful and multiply linked personal experience to a greater social and cosmic order. On the one hand concupiscence and the irresistible attractions of sexual rapture stood as marks in the flesh of mankind's fall from grace, of the essential weakness of the will. But on the other hand pleasure was construed as precisely what compelled men and women to reproduce themselves, despite what prudence or individual interest might dictate. The import of the Timaeus's account of creation was that in both men and women brazenly self-willed genitals assured the propagation of the species through their love of intercourse even if reason might urge abstinence. This notion is elaborated with an especial poignancy for women in the popular Renaissance literature. Only “ardent appetite and lust” prevented the “bitter decay in short time of mankind”; only the fact that a mercifully short memory and an insatiable desire made women forget the dangerous agonies of childbirth allowed the human race to continue. Women, with clinched fists “in the great pain and intolerable anguish” of the time of their travail, “forswear and bind themselves never to company with a man again.” Yet time after time, the “singular natural delight between men and women” causes them to forget “both the sorrow passed and that which is to come.” If the bearing of children was God's offer of consolation for the loss of eternal life, the lethean pleasures of sex were a counterweight to its pain. The biological “invisible hand” of delight made them cooperate in assuring the immortality of the species and the continuity of society.24

Male and female bodies in these Renaissance accounts were, as is perhaps obvious, still very much those of Galen. Consider Leonardo's drawings (fig. 1), or the far more influential engravings in Andreas Vesalius' epoch-marking De humani corporis fabrica and his more popular Tabulae sex, all of which reinforce the hoary model through striking new representations. When Vesalius is self-consciously trying to emphasize the homologies between male and female organs of generation (figs. 2 and 3) and, even more telling, when he is not (fig. 4), he is firmly in the camp of the “ancients,” however much he might rail against the authority of Galen in other contexts. But the anatomical accuracy of Galen is not what is at issue here. The female reproductive system can be, and indeed on occasion was still in the late nineteenth century, “accurately” rendered in the manner of Vesalius long after the old homologies had lost their credibility (figs. 5 and 6). But after the late seventeenth century and the collapse of the hierarchical model there was, in general, no longer any reason to draw the vagina and external pudenda in the same frame with the uterus and the ovaries. Bodies did not change, but the meanings of the relationship between their parts did.25

Seventeenth-century audiences still gave credence to a whole collection of
tales, going back at least to Pliny, that illustrate the structural similarities and thus the mutability of male and female bodies. Sir Thomas Browne, in his *Enquiries into Vulgar and Common Errors* (1646), devotes an entire chapter to the question of whether “every hare is both male and female.” He concludes that “as for the mutation of sexes, or transition of one into another, we cannot deny it in Hares, it being observable in Man.” Some pages later, in an exegesis of Aristotle and the schoolmen, he continues on this subject: “As we must acknowledge this Androgynal condition in Man, so can we not deny the like doth happen in beasts.” Ambroise Pare, the great sixteenth-century surgeon, recounts the case of one Germain Garnier, christened Marie, who was serving in the retinue of the king. Germain was a well-built young man with a thick, red beard who until he was fifteen had lived and dressed as a girl, showing “no mark of masculinity.” But then, in the heat of puberty,

as he was in the fields and was rather robustly chasing his swine, which were going into a wheat field, [and] finding a ditch, he wanted to cross over it, and having leaped, at that very moment the genitalia and the male rod came to be developed in him, having ruptured the ligaments by which they had been held enclosed.

Marie, soon to be renamed, hastened home to his/her mother, who consulted physicians and surgeons, all of whom assured her that her daughter had become her son. She took him to the bishop, who called an assembly that decided that indeed a transformation had taken place. “The shepard received a man's name: instead of Marie . . . he was called Germain, and men's clothing was given him.” (Some persisted in calling him Germain-Marie as a reminder that he had once been a girl.) Montaigne tells the same story, “attested to by the most eminent officials of the town.” There is still, he reports, in the area “a song commonly in the girls' mouths, in which they warn one another not to stretch their legs too wide for fear of becoming males, like Marie Germaine.”

How were transformations like Marie's possible? Pare offers the following account:

The reason why women can degenerate into men is because women have as much hidden within the body as men have exposed outside; leaving aside, only, that women don't have so much heat, nor the ability to push out what by the coldness of their temperament is held bound to the interior. Wherefore if with time, the humidity of childhood which prevented the warmth from doing its full duty being exhaled for the most part, the warmth is rendered more robust, vehement, and active, then it is not an unbelievable thing if the latter, chiefly aided by some violent movement, should be able to push out what was hidden within.

The learned Caspar Bauhin explains more succinctly how “women have changed into men,” namely, “The heat having been rendered more vigorous, thrusts the testes outward.” Such transformations, however, seem to work only up the great chain of being.

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We therefore never find in any true story that any man ever became a woman, because Nature tends always toward what is most perfect and not, on the contrary, to perform in such a way that what is perfect should become imperfect.27

Moreover, the Galenic structure survived the discovery of a new, and one would think totally incompatible, homology: that of the clitoris to the penis. This organ first was described accurately by Readolus Colombus, Vesalius' successor in the chair at Padua, and was called in various sixteenth-century learned texts the mentula muliebris (female penis or woman's yard, to use the English vernacular), columnella (column), crista (cock's comb), nympha (the term used by Galen presumably to refer to this organ), dulcedo amoris or oestrum veneris (taon de Venus in French, referring to a frenzy, the oestrum metaphorically linked to the taon, i.e., “gadfly” or “oxfly”). Jane Sharp, whose 1671 midwifery guide was last reprinted in 1728, could happily argue at one point in her work that the vagina, “which is the passage for the yard, resembleth it turned inward,” while arguing two pages later and with no apparent embarrassment, that the clitoris is the female penis. “It will stand and fall as the yard doth and makes women lustful and take delight in copulation,” thus helping to assure the conditions necessary for conception. The labia thus fit nicely into both systems of analogies. They give women great pleasure in copulation and, as the ancients said, defend the matrix from outward violence, but they are also, as John Pechey puts it, “that wrinkled membranous production, which clothes the Clitoris like a foreskin.” This left open the question of whether the vagina or the clitoris were to be thought of as the female penis, though both could be regarded as erectile organs. One midwifery manual notes that “the action of the clitoris is like that of the yard, which is erection” and, on the very same page, that “the action of the neck of the womb [the vagina and cervix] is the same with that of the yard; that is to say, erection.” Thus, until the very end of the seventeenth century there seemed no difficulty in holding that women had an organ homologous, through topological inversion, to the penis inside their bodies, the vagina, and another one morphologically homologous to the penis, outside, the clitoris.28

Perhaps the continued power of the systemic, genitaly unfocused account of sex inherited by Renaissance writers from antiquity—the view of the sexually excited body as a great boiler heating up to blow off steam—explains why mutually incompatible interpretations of male and female genitals caused so little consternation. Seventeenth-century writers seem to have welcomed the idea that male and female pleasure was located in essentially the same kind of organ. They remain undisturbed by the clitoris's supposed dual function—licit pleasure in heterosexual intercourse and illicit pleasure in “tribadism.” They elaborate the penis/clitoris homology with great precision: the outward end of the clitoris, one physician writes, is like the glans of the penis, and like it “the seat of the greatest pleasure in copulation in women.” According to another, the tip of the clitoris is,
therefore, also called the "amoris dulcedo." They would have found very curious Marie Bonaparte's contention that "clitoroidal women" suffer from one of the stages of frigidity or protohomosexuality. Rather, as Nicholas Culpepper writes without the fanfare of controversy: "It is agreeable both to reason and authority, that the bigger the clitoris in a woman, the more lustful they are." 29

The ancient account of bodies and sexual pleasures was not ultimately dependent for its support simply on facts or supposed facts about the body, even though it was articulated in the concrete language of anatomy and physiology. Were it otherwise, the system of homologies would have fallen well before its time from the sheer weight of readily apparent difficulties. The recognition of the clitoris is a case in point. The word clitoris makes its first known English appearance in 1615 when Helkiah Crooke argues that it differs from the yard: "[It] is a small body, not continued at all with the bladder, but placed in the height of the lap. The clitoris hath no passage for the emission of seed; but the virile member is long and hath a passage for seed." Yet, one can easily set beside this quite correct list of facts equally unexceptional observations supporting the contrary view. The clitoris, for example, is called the tentigo in Thomas Vicary's enormously popular The Anatomie of the Body of Man (1586), a term borrowed from the eleventh-
century Arab medical writer Albucaiss meaning in Latin “a tenseness or lust; an erection.” It is, of course, erectile and erotogenous, and thus a “counterfeit yard,” if one chooses to emphasize these features.\textsuperscript{30}

The homological view survived not only the potential challenge posed by the anatomist Colombus's discovery of the clitoris, but other expressions of scepticism as well. Crooke, in the text cited above, attacks the Galenic homologies in general, pointing out that the scrotum of a man is thin-skinned while the base of the womb, its homologue, is “a very thicke and tight membrane.” Again, this is scarcely a telling point when compared with the self-evident fact that the womb carries a baby while the penis does not. Moreover, the topological inversions suggested by Galen are, and were known to be, manifestly implausible if taken literally. Recall the mind-bending metaphor of the womb as a penis inside itself, like the eyes of a mole, or perfectly formed but hidden within, like the eyes of other animals in utero. Jacques Duval, another seventeenth-century physician, proposes trying Galen's “thought experiment” and concludes quite rightly that it does not work: “If you imagine the vulva completely turned inside out . . . you will have to envisage a large-mouthed bottle hanging from a woman, a bottle whose mouth rather than base would be attached to the body and which would bear no resemblance to what you had set out to imagine.” But in fact, a bottle shaped like the vagina and womb hanging by its mouth does resemble a penis; indeed it is the precise form of the codpiece (fig. 7).\textsuperscript{31}

The fact that criticisms of the Galenic model are not only self-evident but were also sprinkled throughout the literature is a reminder that the cultural construction of the female in relation to the male, while expressed in terms of the body's concrete realities, was more deeply grounded in assumptions about the nature of politics and society. It was the abandonment of these assumptions in the Enlightenment that made the hierarchically ordered system of homologies hopelessly inappropriate. The new biology, with its search for fundamental differences between the sexes and between their desires, emerged at precisely the time when the foundations of the old social order were irremediably shaken. Indeed, as Havelock Ellis discovered, “It seems to have been reserved for the nineteenth century to state that women are apt to be congenitally incapable of experiencing complete sexual satisfaction and are peculiarly liable to sexual anaesthesia.”\textsuperscript{32}

But what happened to the old biology, to its complex of metaphors and relations? In some respects nothing happened to it; or, in any case, nothing happened very fast.

\textbf{Politics and the Biology of Sexual Difference}

When in the 1740s the young Princess Maria Theresa was worried because she did not immediately become pregnant after her marriage to the

\textbf{Thomas Laqueur}
future Hapsburg emperor, she asked her physician what she ought to do. He is said to have replied:

Ceterum censeo vulvam Sanctissimae Majestatis ante coitum esse titillandum [Moreover I think the vulva of Her Most Holy Majesty is to be titillated before intercourse].

The advise seems to have worked as she bore more than a dozen children. Similarly, Albrecht von Haller, one of the giants of eighteenth-century biological science, still postulated an erection of both the external and the internal female reproductive organs during intercourse and regarded woman’s orgasm as a sign that the ovum has been ejaculated from the ovary. Although he is well aware of the existence of the sperm and the egg and of their respective origins in the testes and ovaries, and has no interest in the Galenic homologies, the sexually aroused female in his account bears a remarkable resemblance to the male under similar circumstances.

When a woman, invited either by moral love, or a lustful desire of pleasure, admits the embraces of the male, it excites a convulsive constriction and attrition of the very sensible and tender parts; which lie within the contiguity of the external opening of the vagina, after the same manner as we observed before of the male.

The clitoris grows erect, the nymphae swell, venous blood flow is constricted, and the whole external genitalia become turgid as the system works “to raise the pleasure to the highest pitch.” A small quantity of lubricating mucous is expelled in this process, but the same action which, by increasing the heights of pleasure, causes a greater conflux of blood to the whole genital system of the female, occasions a much more important alteration in the interior parts.

The uterus becomes turgid with inflowing blood; likewise the fallopian tubes become erect “so as to apply the ruffle or fingered opening of the tube to the ovary.” Then, at the moment of mutual orgasm, the “hot male semen” acting on this already excited system causes the extremity of the tube to reach still further until, “surrounding and compressing the ovarium in fervent congress, [it] presses out and swallows a mature ovum.” The extrusion of the egg, Haller points out finally to his learned readers, who would probably have read this torrid account in the original Latin, is not performed without great pleasure to the mother, nor without an exquisite unrelatable sensation of the internal parts of the tube, threatening a swoon or fainting fit to the future mother.33

The problem with which this essay began thus remains. Neither advances in reproductive biology nor anatomical discoveries seem sufficient to explain the dramatic revaluation of the female orgasm that occurred in the late eighteenth century and the even more dramatic reinterpretation of the female body in

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relation to that of the male. Rather, a new model of incommensurability triumphed over the old hierarchical model in the wake of new political agendas. Writers from the eighteenth century onward sought in the facts of biology a justification for cultural and political differences between the sexes that were crucial to the articulation of both feminist and antifeminist arguments. Political theorists beginning with Hobbes had argued that there is no basis in nature for any specific sort of authority—of a king over his people, of slaveholder over slave, nor, it followed, of man over woman. There seemed no reason why the universalistic claims made for human liberty and equality during the Enlightenment should exclude half of humanity. And, of course, revolution, the argument made in blood that mankind in all its social and cultural relations could be remade, engendered both a new feminism and a new fear of women. But feminism itself, and indeed the more general claims made by and for women to public life—to write, to vote, to legislate, to influence, to reform—was also predicated on difference.

Thus, women’s bodies in their corporeal, scientifically accessible concreteness, in the very nature of their bones, nerves, and, most important, reproductive organs came to bear an enormous new weight of cultural meaning in the Enlightenment. Arguments about the very existence of female sexual passion, about women’s special capacity to control what desires they did have, and about their moral nature generally were all part of a new enterprise seeking to discover the anatomical and physiological characteristics that distinguished men from women. As the natural body itself became the gold standard of social discourse, the bodies of women became the battleground for redefining the most ancient, the most intimate, the most fundamental of human relations: that of woman to man.

It is relatively easy to make this case in the context of explicit resistance to the political, economic, or social claims of women. Prominent male leaders in the French Revolution, for example, strenuously opposed increased female participation in public life on the grounds that women’s physical nature, radically distinguished from that of men and represented most powerfully in the organs of reproduction, made them unfit for public life and better suited to the private sphere. Susanna Barrows maintains that fears born of the Paris Commune and of the new political possibilities opened up by the Third Republic generated an extraordinarily elaborate physical anthropology of sexual difference to justify resistance to change. In the British context the rise of the women’s suffrage movement in the 1870s elicited a similar response. Tocqueville argues that in the United States democracy had destroyed the old basis for patriarchal authority and that consequently it was necessary to trace anew and with great precision “two clearly distinct lines of action for the two sexes.” In short, wherever boundaries were threatened arguments for fundamental sexual differences were shoved into the breach.34

But reinterpretations of the body were more than simply ways of reestablishing hierarchy in an age when its metaphysical foundations were being rapidly
effaced. Liberalism postulates a body that, if not sexless, is nevertheless undifferentiated in its desires, interests, or capacity to reason. In striking contrast to the old teleology of the body as male, liberal theory begins with a neuter body, sexed but without gender, and of no consequence to cultural discourse. The body is regarded simply as the bearer of the rational subject, which itself constitutes the person. The problem for this theory then is how to derive the real world of male dominion of women, of sexual passion and jealousy, of the sexual division of labor and cultural practices generally from an original state of genderless bodies. The dilemma, at least for theorists interested in the subordination of women, is resolved by grounding the social and cultural differentiation of the sexes in a biology of incommensurability that liberal theory itself helped bring into being. A novel construal of nature comes to serve as the foundation of otherwise indefensible social practices.

For women, of course, the problem is even more pressing. The neuter language of liberalism leaves them, as Jean Elshtain recently argues, without their own voice. But more generally the claim of equality of rights based on an essential identity of the male and female, body and spirit, robs women both of the reality of their social experience and of the ground on which to take political and cultural stands. If women are indeed simply a version of men, as the old model would have it, then what justifies women writing, or acting in public, or making any other claims for themselves as women? Thus feminism, too—or at least historical versions of feminisms—depends upon and generates a biology of incommensurability in place of the teleologically male interpretation of bodies on the basis of which a feminist stance is impossible.35

Rousseau’s essentially antifeminist account is perhaps the most theoretically elaborated of the liberal theories of bodies and pleasures, but it is only one of a great many examples of how deeply a new biology is implicated in cultural reconstruction. In the state of nature, as he imagined it in the first part of A Discourse on Inequality, there is no social intercourse between the sexes, no division of labor in the rearing of young, and, in a strict sense, no desire. There is, of course, brute physical attraction between sexes, but it is devoid of what he calls “moral love,” which “shapes this desire and fixes it exclusively on one particular object, or at least gives the desire for this chosen object a greater degree of energy.” In this world of innocence there is no jealousy or rivalry, no marriage, no taste for this or that woman; to men in the state of nature “every woman is good.” Rousseau is remarkably concrete in specifying the reproductive physiology of women that must, in his view, underlie this condition. Hobbes, he argues, erred in using the struggle of male animals for access to females as evidence for the natural combativeness of the primitive human state. True, he concedes, there is bitter competition among beasts for the opportunity to mate, but this is because for much of the year females refuse the male advance. Suppose they were to make themselves available only two months out of every twelve: “It is as if the
population of females had been reduced by five-sixth.” But women, he points out, have no such periods of abstinence and are thus not in short supply:

No-one had ever observed, even among savages, females having like those of other species fixed periods of heat and exclusion. Moreover, among several of such animals, the whole species goes in heat at the same time, so that there comes a terrible moment of universal passion, a moment that does not occur in the human species, where love is never seasonal.

Reproductive physiology and the nature of the menstrual cycle bear an enormous weight here; the state of nature is in large measure conceptualized as dependent on the supposed biological differences between women and beasts.36

But what happened to this primitive state of desire? Rousseau gives an account of the geographical spread of the human race, of the rise of the division of labor, of how in developing a dominion over animals man “asserted the priority of his species, and so prepared himself from afar to claim priority for himself as an individual.” But the individuation of desire, the creation of what he calls the moral part of love (“an artificial sentiment”), and the birth of imagination (“which causes such havoc amongst us”) are construed as the creation of women and, specifically, as the product of female modesty. The Discourse presents this modesty as volitional, as instrumental: “[It is] cultivated by women with such skill and care in order to establish their empire over men, and so make dominant the sex that ought to obey.” But in Emile modesty is naturalized: “While abandoning women to unlimited desires, He [the Supreme Being] joins modesty to these desires in order to constrain them.” And somewhat later in a note Rousseau adds: “The timidity of women is another instinct of nature against the double risk they run during their pregnancy.” Indeed, throughout Emile he argues that natural differences between the sexes are represented and amplified in the form of moral differences that society erases only at its peril.37

Book 5 begins with the famous account of sexual difference and sameness. “In everything not connected with sex, woman is man. . . . In everything connected with sex, woman and man are in every respect related but in every respect different.” But, of course, a great deal about women is connected with sex: “The male is male only at certain moments. The female is female her whole life. . . . Everything constantly recalls her sex to her.” “Everything,” it turns out, is everything about reproductive biology: bearing young, suckling, nurturing, and so on. Indeed the chapter becomes a catalogue of physical and consequently moral differences between the sexes; the former, as Rousseau says, “lead us unawares to the latter.” Thus, “a perfect woman and a perfect man ought not to resemble each other in mind any more than in looks.” From the differences in each sex’s contribution to their union it follows that “one ought to be active and strong, the other passive and weak.” “One must necessarily will and be able; it suffices that the other put up little resistance.” The problem with Plato, Rousseau argues, is that he excludes “families from his regime and no longer knowing what to do

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with women, he found himself *forced to make them men.*” It is precisely this sameness of “the exercises” Plato gives men and women, this “civil promiscuity which throughout confounded the two sexes in the same employments and the same labors and which cannot fail to engender the most intolerable abuses,” to which Rousseau objects. But what are these objectionable abuses?

I speak of that subversion of the sweetest sentiments of nature, sacrificed to an artificial sentiment which can only be maintained by them—as though there were no need for a natural base on which to form conventional ties; as though the love of one's nearest were not the principle of the love one owes the state; as though it were not by means of the small fatherland which is the family that the heart attaches itself to the large one; as though it were not the good son, the good husband, and the good father [all males of course] who make the good citizen.

Finally, returning to the ostensible subject of the book, Rousseau concludes that “once it is demonstrated that man and woman are not and ought not to be constituted in the same way in either their character or temperament, it follows that they ought not to have the same education.”

For Rousseau a great deal depends, it turns out, on the natural modesty of women and on their role, distinct from the male's, in reproducing the species. Indeed, all of civilization seems to have arisen in consequence of the secular fall from innocence when the first woman made herself temporarily unavailable to the first man. But Rousseau is simply pushing harder on a set of connections that are commonplace in the Enlightenment—although by no means always so antifeminist in their interpretation. In his article on “jouissance,” Diderot locates the creation of desire, of marriage and the family if not of love itself, at the moment women first came to withhold themselves from just any man and chose instead one man in particular,

when women began to discriminate, when she appeared to take care in choosing between several men upon whom passion cast her glances. . . . Then, when the veils that modesty cast over the charms of women allowed an inflamed imagination the power to dispose of them at will, the most delicate illusions competed with the most exquisite of senses to exaggerate the happiness of the moment . . . two hearts lost in love vowed themselves to each other forever, and heaven heard the first indiscreet oaths.

Most prominently among the figures of the Scottish Enlightenment, John Millar argues for the critical role of women and their virtues in the progress of civilization. Far from being lesser men, they are treated in his *Origin of the Distinctions of Ranks* as both a moral barometer and as an active agent in the improvement of society. Millar's case begins with the claim that sexual relations, being most susceptible “to the peculiar circumstances in which they are placed and most liable to be influenced by the power of habit and education,” are the most reliable guide to the character of a society. In barbarous societies, for example, women accompanied men to war and were scarcely different from them; in peaceful societies that had progressed in the arts, a woman's “rank and station”
were dictated by her special talents for rearing and maintaining children and by her "peculiar delicacy and sensibility," whether these derived from her "original constitution" or her role in life. Thus civilization in Millar's account leads to an increasing differentiation of male and female social roles; this greater differentiation of roles—and specifically what he takes to be improvements in the lot of women—are signs of moral progress. But women themselves in more civilized societies are also the engines of further advance. "In such a state, the pleasures which nature has grafted upon love between the sexes, become the source of an elegant correspondence, and are likely to have a general influence upon the commerce of society." In this, the highest state—he is thinking of French salon society and of the femm savant—

[women are] led to cultivate those talents which are adapted to the intercourse of the world, and to distinguish themselves by polite accomplishments that tend to heighten their personal attractions, and to excite those peculiar sentiments and passions of which they are the natural objects.

Thus, desire among civilized men, and indeed modern civilization, is inextricably bound up in Millar's moral history with feminine accomplishment. 40

It is hardly surprising in the context of Enlightenment thought that the moral and physical differentiation of women from men is also critical to the political discourse of women writers—from Anna Wheeler and early socialists at one end of the political spectrum through the radical liberalism of Mary Wollstonecraft to the domestic ideology of Hannah More and Sarah Ellis. For Wheeler and others, as Barbara Taylor argues, the denial or devaluation of female passion is to some degree part of a more general devaluation of passion. Reason, they dare to hope, would be triumphant over the flesh. Wheeler and early utopian socialists are, after all, writing out of the tradition that produced William Godwin's argument that civilization would ultimately eliminate destructive passions, that the body finally would be curbed by Enlightenment and be subsumed under the captancy of the mind. It is against this view, as Catherine Gallagher argues, that Thomas Malthus rehabilitates the body and insists upon the absolute irreducibility of its demands, especially its sexual demands. 41

But the nature of female passion and of the female body is unresolved in Wheeler's work. Her book, An Appeal of One-Half the Human Race, Women, Against the Pretensions of the Other Half, Men, To Retain Them in Political and Thence in Civil and Domestic Slavery, jointly written with William Thompson, is a sustained attack on James Mill's argument that the interests of women and children are subsumed—i.e., are virtually represented by—the interests of husbands and fathers. This "moral miracle," as they call it, would be credible were Mill right in holding that women are protected against abuse because men "will act in a kind way toward women in order to procure from her those gratifications, the zest of which depends on the kindly inclinations of one party yielding them." Since women are
themselves free from sexual desire, they are in an excellent bargaining position vis-à-vis men, who are decidedly not liberated from their bodies. Nonsense, say Wheeler and Thompson. If women are “like the Greek Asphasia,” cold and sexless, the argument might have force. But not only are they, like men, sexed and desirous but, in the current state of affairs, “Woman is more the slave of man for gratification of her desires than man is to woman.” The double standard allows men to seek gratification outside of marriage but forbids it to women.42

Both Wheeler and Thompson’s analysis of the sorry shape of the male world and their need to claim some political ground for women lead them dramatically to change their emphasis and make almost the opposite case as well. In a chapter entitled “Moral Aptitude for Legislation More Probable in Women than Men,” woman is represented not as equally passionate as man but as more moral, more empathetic, and generally better able to act in accord with the common interest and not merely out of self-interest. Whether women had these traits in some hypothetical state of nature or acquired them through a kind of moral Lamarckianism is unclear, but in the modern world they demonstrate a greater susceptibility to pain and pleasure, a more powerful desire to promote the happiness of others, and a more developed “moral aptitude” than men. These, Wheeler and Thompson argue, are the most important qualities in a legislator. It is, moreover, precisely women’s inferior strength and her inability to oppress others through superior force as men are wont to do that will ensure that they rule fairly and justly. Moreover, women as mothers and as the weaker sex need a world at peace far more than men, and they would thus be constitutionally more likely to legislate ways to obtain it. Wheeler and Thompson’s arguments are more poignantly put than this summary suggests, but they contribute to a construction of woman not very different from that of the domestic ideologists. Whether through inherent nature—because they have more sensitive nervous systems, as many eighteenth- and nineteenth-century doctors held—or through centuries of suffering, women are construed as less passionate and hence morally more adept than men.43

As a radical liberal, Mary Wollstonecraft is caught in much the same dilemma. On the one hand, liberal theory pushes her to declare that the neutral, rational subject has in essence no sex. On the other hand, she was in her own life only too aware of the power, indeed the destructive violence, of sexual passion. Moreover she seems to have held, with Rousseau, that civilization increases desire and that “people of sense and reflection are most apt to have violent and constant passions and to be preyed on by them.” Finally, as Zillah Eisenstein argues, for Wollstonecraft to subscribe to the notion of the subject as genderless would be to deny what to her were manifestly present, the particular qualities of women’s experiences.44

Her solution was to take for women the moral high ground. Blessed with a unique susceptibility “of the attached affections,” women’s special role in the world is tocivilize men and raise up children to virtue. In the Female Reader,
Wollstonecraft lays on a heavy dose of religion, which she says will be “the solace and support” of her readers when they find themselves, as they often will, “amidst the scenes of silent unobserved distress.” “If you wish to be loved by your relations and friends,” she counsels without detectable irony, “prove that you can love them by governing your temper.” Good humor, cheerful gaiety, and the like are not to be learned in a day. Indeed, as Barbara Taylor argues, Wollstonecraft shares with early socialist feminists a commitment to “passionlessness,” whether out of some sense of its political possibilities, an acute awareness of passion’s dangers, or a belief in the special undesiring qualities of the female body.45

In any case, Wollstonecraft’s arguments for the differences between the sexes begin to sound very much like Sarah Ellis’s, however profound the political chasm that divided the two women. In Wives of England, one of the canonical works of domestic ideology, Ellis argues that from the wife and mother, “as head of a family and mistress of a household, branch off in every direction trains of thought, and tones of feeling, operating upon those more immediately around her, but by no means ceasing there . . . extending outwards in the same manner, to the end of all things.” This influence is born of the heightened moral sensibilities with which the female organism seems blessed. Though women are to have no role in the world of mundane politics, they are to confront issues such as extinction of slavery, the abolition of war in general, cruelty to animals, the punishment of death, temperance, and many more, on which, neither to know, nor to feel, is almost equally disgraceful.

In short, women’s politics must be the politics of morality.46

All of this is not intended as an argument that writers from Hobbes, through Sade and Rousseau, and on to Ellis were all engaged in precisely the same theoretical or political undertaking. Rather, I have sought to display the wide range of apparently unrelated political agendas in which a new differentiation of the sexes occupied a critical place. Desire was given a history, and the female body distinguished from the male’s, as the seismic transformations of European society between the seventeenth and the nineteenth centuries put unbearable pressure on old views of the body and its pleasures. A biology of hierarchy grounded in a metaphysically prior “great chain of being” gave way to a biology of incommensurability in which the relationship of men to women, like that of apples to oranges, was not given as one of equality or inequality but rather as a difference whose meaning required interpretation and struggle.

Reproductive Biology and the Cultural Reconstruction of Women

I want now to turn from political and moral theory to the sciences of reproductive biology, to the seemingly unpromising domain of ovarian and uter-
ine histology and the clinical observation of menstruation and fertility. Aldous Huxley's remark that "the sciences of life can confirm the intuitions of the artist, can deepen his insights and extend the range of his vision" could as well be said of those who produced what he takes to be a prior and culturally pure knowledge. The dry and seemingly objective findings of the laboratory and the clinic become, within the disciplines practiced there, the stuff of art, of new representations of the female as a creature profoundly different from the male. And this "art," clothed in the prestige of natural science, becomes in turn the specie, the hard currency of social discourse.47

But I do not want to give the impression that reproductive biology or clinical gynecology are simply exercises in ideology. I will therefore begin by describing a critically important discovery of the early nineteenth century: that some mammals—nineteenth-century researchers believed all mammals—ovulate spontaneously during regularly recurring periods of heat, independently of intercourse, conception, pleasure, or any other subjective phenomena. Until the early 1840s the question of when and under what conditions ovulation took place was as obscure as it had been in 1672 when de Graaf argued that what he called the female testicle actually produced eggs. In the first place no one had observed a mammalian egg until 1827, when Karl Ernst von Baer, in a brilliant piece of research, definitively demonstrated its existence, first in the ovarian follicle and subsequently in the fallopian tubes of a dog. Until then, direct evidence for ovulation was lacking. At the time of his great discovery, von Baer still believed that an animal ovulated only when sexually stimulated; he therefore used a bitch that he knew to have quite recently mated. This was only reasonable, since the late eighteenth-century researches of the Englishmen William Cruickshank and John Haighton, on which von Baer relied, had shown that rabbits do not generally ovulate without intercourse; indeed they had claimed that ovulation is dependent on conception.48

In humans, the evidence for spontaneous ovulation was, in the early nineteenth century, highly ambiguous. Numerous anecdotal clinical reports, based on increasingly available autopsy material, claimed that cicatrices—scars remaining after a wound, sore, or ulcer has healed—can be demonstrated on ovaries of virgins and that these are left there by the release of an ovum and, more to the point, by the release of numerous ova corresponding to the number of menstrual cycles that the woman had had. But what, if anything, did this prove? Very little. Johann Friederich Blumenbach, professor of medicine at Göttingen and one of the most distinguished physicians of Europe, for example, had been among the first to notice by the late eighteenth century that ovarian follicles burst without the presence of semen or even "without any commerce with the male." But he concluded from these cases only that, on occasion, "venereal ardour alone... could produce, among the other great changes in the sexual organs, the enlargement of the vesicles" and even their rupture.
On this point I find it difficult in the present state of knowledge to make up my mind; but I think it pretty evident that, although semen has no share in bursting the ovarium, the high excitement that occurs during the heat of brutes and the lascivious states of the human virgin is sufficient frequently to effect the discharge of the ova. It is perhaps impossible otherwise to explain the fact that ova are so commonly expelled from the ovaria, and impregnated whenever a connection is arbitrarily or casually brought about.

Johannes Muller, professor of physiology at Berlin, a leading proponent of biological reductionism, concludes that scars on the ovaries of virgins mark anomalous ovulations. Thus, while the exact forces causing the egg to be thrust into the fallopian tube remained unknown, the evidence until the 1840s was by no means sufficient to establish the normal occurrence of ovulation independent of coition, venereal arousal, or even conception.49

The critical experiment establishing spontaneous ovulation in dogs and by extension other mammals was elegantly simple. In the novelistic style that characterizes so much early nineteenth-century scientific reporting, Theodor L. W. Bischoff tells his reader that on 18 and 19 December 1843 he noted that a large bitch in his possession had begun to go into heat. On the 19th he allowed her contact with a male dog, but she refused its attentions. He kept her securely imprisoned for two more days and then brought on the male dog again; this time she was interested but the animals were separated before coition could take place. At ten o’clock two days later, i.e., on the morning of the 23rd, he cut out her left ovary and fallopian tubes and carefully closed the wound. The Graafian follicles in the excised ovary were swollen but had not yet burst. Five days later he killed the dog and found in the remaining ovary four developing corpus lutei filled with serum; careful opening of the tubes revealed four eggs. He concludes:

I do not think it is possible to demonstrate with any more thoroughness the whole process of the ripening and expulsion of the eggs during heat, independently of coition, than through this dual observation on one and the same animal.

And of course if ovulation occurs independently of coition it must also occur independently of fecundation. Indeed, F. A. Pouchet considered the later discovery in itself so major that he formulated it as his “fifth” and critical law of reproductive biology, "le point capital" of his 476-page magnus opus. The historian Michelet was enraptured and hailed Pouchet for having formulated the entire science of reproductive biology in a definitive work of genius, a monument of daring grandeur.50

Granted that dogs and pigs go into heat and during this period ovulate whether they mate or not, what evidence was there that women’s bodies behave in a similar manner? No one prior to the early twentieth century had claimed to have seen a human egg outside the ovary. Bischoff admitted that, in the absence of such a discovery, there was no direct proof for the extension of his theory to women, but he was sure that an egg would be found soon enough. In 1881, V.
Hensen, professor of physiology at Kiel, notes in L. Hermann’s standard *Handbuch der Physiologie* that except for two probably spurious reports, human eggs still eluded investigators, though he adds, in a curiously optimistic footnote, that “it can not be so difficult to find a [human] egg in the [fallopian] tubes.” In fact, an unfertilized egg was not reported until 1930, and then in the context of an argument against the nineteenth-century view relating heat to menstruation. Thus, the crucial experimental link—the discovery of the egg—between menstruation on the one hand and the morphology of the ovary on the other was lacking in humans. Investigators could only note in the cases that came their way that women were menstruating or that they were at some known point in their menstrual cycles and then attempt to correlate these observations with the structural characteristics of the ovary removed in surgery or autopsy. They lacked as a biological triangulation point the actual product of the ovary, and the results of their studies were manifestly unsatisfactory. Evidence for the timing of ovulation based on pregnancy from a single coition whose occurrence in the menstrual cycle was supposedly known was likewise increasingly ambiguous. The role of the oocytes in the reproductive cycle of mammals was very imperfectly understood until the publication of a series of papers beginning in 1900, while the hormonal control of ovulation by the ovary and the pituitary remained unknown until the 1930s.51

But despite the paucity of evidence in humans, the discovery of spontaneous ovulation in dogs and other mammals was of enormous importance in the history of representing women’s bodies. Beginning in the middle of the nineteenth century, the ovaries came to be regarded as largely autonomous control centers of reproduction in the female animal, and in humans they were thought to be the essence of femininity itself. “Propter solum ovarium mulier est id quod est,” as the French physician Achilles Chereau puts it; it is only because of the ovary that woman is what she is. Moreover, menstruation in women came to be interpreted as the precise equivalent of the heat in animals, marking the only period during which women are normally fertile. Widely cited as Pouchet’s eighth law, the view was that “the menstrual flow in women corresponds to the phenomena of excitement which manifests itself during the rut [l’époque des amours] in a variety of creatures and especially in mammals.” The American physician Augustus Gardner drew out the implications of the menstruation/rut analogy less delicately: “The bitch in heat has the genitals tumified and reddened, and a bloody discharge. The human female has nearly the same.” “The menstrual period in women,” announces the *Lancet* in 1843, “bears a strict physiological resemblance” to the heat of “brutes.”52

With these interpretations of spontaneous ovulation the old physiology of pleasure and the old anatomy of sexual homologies were definitively dead. The ovary, whose distinction from the male testes had only been recognized a century earlier, became the driving force of the whole female economy, with menstruation
the outward sign of its awesome power. As the distinguished British gynecologist Mathews Duncan put it, in an image too rich to be fully teased apart here: “Menstruation is like the red flag outside an auction sale; it shows that something is going on inside.” And that something, as will become clear, was not a pretty sight; the social characteristics of women seemed writ in blood and gore. The silent workings of a tiny organ weighing on the average seven grams in humans, some two to four centimeters long, and the swelling and subsequent rupture of the follicles within it, came to represent synecdochically what it was to be a woman.53

But why would anyone believe that menstruation was in women what heat was in the dog? The answer lies outside the bounds of science in a wide range of cultural demands on the enterprise of interpretation. Consider, for example, the answer Bischoff himself offers: the equivalence of menstruation and heat is simply common sense. If one accepts spontaneous ovulation during periods of heat in mammals generally, it “suggests itself.” In any case there is much indirect evidence for the equation of heat and menstruation, in addition to the authority of the “most insightful physicians and naturalists” from the earliest times on.

In fact the analogy was far from evident, and most of those from antiquity to Bischoff’s day who gave their views on the subject repudiated it. Haller’s Physiology is quite explicit on the point that, while there are “some animals, who, at the time of their venal copulation, distil blood from their genitals,” menstruation is peculiar “to the fair sex [of] the human species.” Moreover, in contrast to bleeding in animals, menstruation for Haller is quite independent of the periodicity of sexual desire. Intercourse neither increases nor decreases the menstrual flux; women deny a heightened “desire of venery” during their periods and report rather being “affected by pain and languor.” Finally, sexual pleasure is localized “in the entrance of the pudendum” and not in the uterus, from which the menses flow. Blumenbach, among the most widely reprinted and translated texts of the next generation, joins Pliny in arguing that only women menstruate, though cautioning his readers that the investigation of the “periodical nature of this hemorrhage is so difficult that we can obtain nothing beyond probability” and should thus be careful not to offer mere conjecture as fact.54

What scant facts there were seemed more anthropological than biological, and these came under severe attack. In a masterful review of the literature up to 1843, Robert Remak, professor of neurology at Posen, argues that even if one grants that, as do healthy women, all or some mammals have regularly recurring periods of bleedings and that the bleeding in animals originates in the uterus and not from the turgescent external genitalia—neither concession being warranted by the evidence—there remains “one further circumstance on which to ground the most radical difference between menstruation and the periodical flow of blood from the genitals of animals”:
In female animals the bleeding accompanies heat [brunst], the period of the most heightened sexual drive, the only time the female will allow the male access, and the only time she will conceive. Quite to the contrary, in women the menstrual period is scarcely at all connected to increased sexual desire nor is fecundity limited to its duration; indeed a kind of instinct keeps men away from women during the menses—some savage people like certain African and American tribes isolate menstruating women in special quarters—and experience shows that there is no time during the inter-menstrual period when women can not conceive. It follows therefore that the animal heat is totally missing in women. . . . Indeed the absence of menstruation in animals is one of the features that distinguish man from the beasts.

Johannes Muller, in his 1843 textbook, comes to similar conclusions. He modestly points out that neither the purposes nor the causes of the periodical return of the menses are known. Quite probably, however, it exists to "prevent in the human female the periodical return of sexual excitation [brunst]" that occurs in animals. Common sense, in short, does not explain why nineteenth-century investigators would want to view the reproductive cycle of women as precisely equivalent to that of other animals.55

Professional politics and the imperatives of a particular philosophy of science offer perhaps part of an answer. As Jean Borie points out, Pouchet's is "une gynaecologie militante"; the same can be said of that of many of his colleagues, especially his French ones. Their mission was to free women's bodies from the stigma of clerical prejudice and centuries of popular superstition and, in the process, to substitute the physician for the priest as the moral preceptor of society. Sexuality would shift from the realms of religion to those of science triumphant. At the heart of the matter lay the faith that reproduction, like nature's other mysteries, was in essence susceptible to rational analysis. Thus, in the absence of specific evidence of human ovulation, "logic" for Pouchet would dictate that women functioned no differently from the bitch, sow, or female rabbit, who in turn followed the same fundamental laws as mollusks, insects, fishes, or reptiles. He explicitly calls his readers' attention to the pristinely scientific, experimentally grounded, character of his work and its avoidance of metaphysical, social, and religious concerns. Thus, there were considerable professional and philosophical attractions to the position that menstruation was like heat and that a sovereign organ, the ovary, ruled over the reproductive processes that made women what they were.56

But this radical naturalization, this reduction of women to the organ that differentiates them from men, was not in itself a claim for their association with nature as against culture and civilization. The argument for the equation of heat and menstruation could be just as easily used to prove women's moral elevation as to prove the opposite. Indeed the very fact that women, on account of their recurrent cycles of rut, were more bound to their bodies than were men was evidence on some accounts for their superior capacity to transcend the brutish
state. Arguing against those who held that the lack of animal-like lust or behavioral disturbances in women belied the new theory of spontaneous ovulation, one noted authority draws attention to “the influence exercised by moral culture on the feelings and passions of humanity.” Observe “the marvellous power exercised by civilization on the mind of her who, from her social position, is rendered the charm of man’s existence.” Is it a wonder that the creature who can subjugate her own feelings, simulate good cheer when her heart is rent in agony, and in general give herself up to the good of the community can exercise control “the more energetically, at a time [menstruation] when she is taught that a stray thought of desire would be impurity, and its fruition pollution.” But then, as if to back off from this model of woman as being simultaneously a periodically excited time bomb of sexuality and a model for the power of civilization to keep it from exploding, G. F. Girdwood concludes that “to aid her in her duty, nature has wisely provided her with the sexual appetite slightly developed.”

The interpretive indigestion of this passage, its sheer turning in on itself, bears witness to the extraordinary cultural burden that the physical nature of women—the menstrual cycle and the functions of the ovaries—came to bear in the nineteenth century. Whatever one thought about women and their rightful place in the world could, it seemed, be mapped onto their bodies, which in turn came to be interpreted anew in the light of these cultural demands. The construal of the menstrual cycle dominant from the 1840s to the early twentieth century rather neatly integrates a particular set of discoveries into a biology of incommensurability. Menstruation, with its attendant aberrations, became a uniquely and distinguishingly female process. Moreover, the analogy now assumed between heat and menstruation allowed evidence hithertofore used against the equivalence of the reproductive cycles of women and brutes to be reinterpreted to mean the opposite. Behavior hidden in women, just as ovulation is hidden, could be made manifest by associating it with the more transparent behavior of animals.

Thus, for example, the author of one of the most massive compilations of moral physiology in the nineteenth century could argue that the quite mad behavior of dogs and cats during heat, their flying to satisfy the “instinct which dominates all else,” leaping around an apartment and lunging at windows, repeated “so to speak indefinitely” if the venereal urge were not satisfied, is but a more manifest version of what the human female too experiences. Since both women and brutes are thought to be subject to the same “orgasme de l’ovulation,” and since the bursting of the ovarian follicle was marked by the same deluge of nervous excitement and bleeding in both, whatever discomfort adolescent girls might feel at the onset of menstruation and whatever irritability or tension a woman might experience during her menses could be magnified through the metaphors of this account and reinterpreted as but the tip of a physiological volcano. Menstruation, in short, was a minimally disguised heat. Women would behave like
brutes were it not for the thin veneer of civilization. Language, moreover, adjusted
to the new science. The whole cultural baggage of *brunst, rut, heat*—words hith-
ertofore applied only to animals—and the neologism *estrous*, derived from the
Latin *oestrus*, “gadfly,” meaning a kind of frenzy and introduced to describe a
process common to all mammals, was subtly or not so subtly laden on the bodies
of women.58

Menstrual bleeding thus become the sign of a periodically swelling and ultima-
tely exploding ovarian follicle whose behavioral manifestation is an “estrous,”
“brunst,” or “rut.” But what one saw on the outside was only part of the story;
the histology of the uterine mucosa and of the ovary revealed much more. Described
in seemingly neutral scientific language, the cells of the endometrium or corpus
luteum became re-presentations, rediscriptions of the social theory of sexual
incommensurability. Walter Heape, the militant antsuffragist and reader in zool-
ogy at Cambridge University, for example, is absolutely clear on what he thinks
of the female in relation to the male body. Though some of the differences
between men and women are “infinitely subtle, hidden” and others “glaring and
forceful,” the truth of the matter, he argues, is that

the reproductive system is not only structurally but functionally fundamentally different
in the Male and the Female; and since all other organs and systems of organs are affected
by this system, it is certain that the Male and Female are essentially different throughout.

They are, he continues, “complementary, in no sense the same, in no sense equal
to one another; the accurate adjustment of society depends on proper observa-
tion of this fact.” A major set of these facts were evident, for Heape and many
others, in the uterus. It should be noted, however, that the basic histology of
menstruation—let alone its causes—was not established until the classic 1908
paper of L. Adler and F. Hitschmann. Previous descriptions, as these two young
Viennese gynecologists noted, were demonstrably inadequate. The point here is
less that so little was known about menstruation than that it was described in a
way that created, through an extraordinary leap of the synecdochic imagination,
a cellular correlative to the socially distinguishing characteristics of women. Hist-
ology mirrored with uncanny clarity what it meant to be female.59

Today, the uterus is described as passing through two stages, rather color-
lessly designated “secretory” and “proliferative,” during each menstrual cycle. In
the nineteenth and early twentieth centuries it was said to proceed through a
series of at least four and as many as eight stages. Its “normal” stage was con-
strued as “quiescence,” followed by “constructive” and “destructive” stages and a
stage of “repair.” Menstruation, as one might surmise, was defined as occurring
at the destructive stage, when the uterus gave up its lining. As Heape puts it, in
an account redolent of war reportage, the uterus during the formation of the
menstrual clot is subject to “a severe, devastating, periodic action.” The entire
epithelium is torn away at each period,
leaving behind a ragged wreck of tissue, torn glands, ruptured vessels, jagged edges of stroma, and masses of blood corpuscles, which it would seem hardly possible to heal satisfactorily without the aid of surgical treatment.

Mercifully, this is followed by the recuperative stage and a return to normalcy. Little wonder that Havelock Ellis, steeped in this rhetoric, would conclude that women live on something of a biological roller coaster. They are, "as it were, periodically wounded in the most sensitive spot in their organism and subjected to a monthly loss of blood." The cells of the uterus are in constant, dramatic flux and subject to soul-wrenching trauma. Ellis concludes, after ten pages of still more data on the physiological and psychological periodicity in women, that the establishment of these facts of morbid psychology, are very significant; they emphasize the fact that even in the healthiest woman a worm however harmless and unperceived, gnaws periodically at the roots of life.60

A gnawing worm is by no means the only metaphor of pain and disease employed to interpret uterine or ovarian histology. The bursting of the follicle is likened by Rudolph Virchow, the father of modern pathology, to teething, "accompanied with the liveliest disturbance of nutrition and nerve force." For the historian Michelet, woman is a creature "wounded each month," who suffers almost constantly from the trauma of ovulation, which in turn is at the center, as Thérèse Moreau has shown, of a physiological and psychological phantasmagoria dominating her life. Less imaginatively, a French encyclopedia likens follicular rupture to "what happens at the rupture of an acute abscess." The German physiologist E. F. W. Pfluger likens menstruation to surgical debridement, the creation of a clean surface in a wound, or alternatively, to the notch used in grafting a branch onto a tree, to the "innoculationschnitt." Imperatives of culture or the unconscious, not positive science, informed the interpretations of the female body more or less explicitly in these accounts.61

While all of the evidence presented so far is by men and produced in a more or less antifeminist context, image making, the construction of the body through science, occurs in feminist writers as well. Mary Putnam Jacobi's The Question of Rest for Women During Menstruation (1886), for example, is a sustained counter-attack against the view that "the peculiar changes supposed to take place in the Graafian vesicles at each period . . . involve a peculiar expenditure of nervous force, which was so much dead loss to the individual life of the woman." Women were therefore unfit for higher education, a variety of jobs, and other activities that demand large expenditures of the mental and physical energy that was thought to be in such short supply. Since the "nervous force" was commonly associated in higher animals and in women with sexual arousal, Jacobi's task becomes one of severing the sexual from the reproductive life of women, of
breaking the ties between the two postulated in the ovarian theory of Bischoff, Pouchet, Adam Raciborski, and others.62

Much of her book is taken up with a compilation of the real or supposed empirical failings of this view. Neither menstruation nor pregnancy, she argues for example, are tied to the time of ovulation; indeed as several hundred cases of vicarious menstruation in women suggest, menstruation itself is only statistically, not in any more fundamental way, bound to ovulation and thus to reproduction. The amount of blood that flows to the uterus even in women who feel particular pelvic heaviness is but a tiny proportion of the body's blood and far less than the proportion transferred to the stomach and intestines during the obviously normal daily processes of digestion. There is no evidence, Jacobi continues, that the uterus, ovaries, or their appendages become turgid during the menstrual period, and thus the effort to link a sort of histological tension of the reproductive organs to sexual tension, to the excitement of heat, must come to naught. But though many of her criticisms are well taken, she neither offers a more compelling new theory of the physiology of ovulation nor gives a clearer picture of cellular changes in the uterine mucosa during the menstrual cycle than do those she is arguing against.63

Jacobi does, however, offer a new metaphor: "All the processes concerned in menstruation converge, not toward the sexual sphere, but the nutritive, or one department of it—the reproductive." The acceleration of blood flow to the uterus "in obedience to a nutritive demand" is precisely analogous to the "afflux of blood to the muscular layer of the stomach and intestines after a meal." Jacobi, like her opponents, tended to reduce woman's nature to woman's reproductive biology. But for her, the essence of female sexual difference lay not in periodically recurring nervous excitement nor in episodes of engorgement, rupture, and release of tension but rather in the quiet processes of nutrition. Far from being periodical, ovulation in Jacobi's account is essentially random: "The successive growth of the Graafian vesicles strictly resembles the successive growth of buds on a bough." Buds, slowly opening into delicate cherry or apple blossoms and, if fertilized, into fruit, are a far cry from the wrenching and sexually intense swellings of the ovary imagined by the opposing theory.64

Indeed, Jacobi's woman is in many respects the inverse of that of Pouchet, Raciborski, or Bischoff. For these men the theory of spontaneous ovulation demanded a woman shackled to her body, woman as nature, as physical being, even if the tamed quality of her modern European avatar spoke eloquently of the power of civilization. For Jacobi, on the other hand, spontaneous ovulation implied just the opposite. Biology provides the basis for a radical split between woman's mind and body, between sexuality and reproduction. The female body carries on its reproductive functions with no mental involvement; conversely, the mind can remain placidly above the body, free from its constraints. Jacobi's first effort at a metaphorical construction of this position uses fish whose ova are
extruded without "sexual congress, and in a manner analogous to the process of defecation and micturition." In higher animals sexual congress is necessary for conception, but ovulation remains spontaneous and independent of excitement. From this, it follows, according to Jacobi, that "the superior contribution of the nutritive element of reproduction made by the female is balanced by an inferior dependence upon the animal or sexual element: in other words, she is sexually inferior."\(^{65}\)

Of course, Jacobi cannot deny that in lower animals female sexual instinct is tied exclusively to reproduction and that a ruptured follicle or follicles are invariably found during the rut. She nevertheless maintains that there is no proof of anything but a coincidental relationship between the state of the ovaries and the congested state of the external and internal genitalia that seems to signal sexual readiness. But in women, she adamantly maintains, "the sexual instinct and reproductive capacity remain distinct; there is no longer any necessary association between sexual impulse, menstruation, and the dehiscence of ova." Indeed, her entire research program is devoted to showing that the menstrual cycle may be read as the ebb and flow of female nutritive rather than sexual activity, that its metabolic contours are precisely analogous to those of nutrition and growth. And this brings one back to the metaphor of the ovary as fruit blossom. The woman buds as surely and as incessantly as the "plant, continually generating not only the reproductive cell, but the nutritive material without which this would be useless." But how, given that women generally eat less than men, do they obtain a nutritive surplus? Because "it is the possibility of making this reserve which constitutes the essential peculiarity of the female sex."\(^{66}\)

The point here is not to belittle Jacobi's scientific work but rather to emphasize the power of cultural imperatives, of metaphor, in the production and interpretation of the rather limited body of data available to reproductive biology during the late nineteenth century. At issue is not whether Jacobi was right in pointing out the lack of coincidence between ovulation and menstruation in women and wrong in concluding that there is therefore no systematic connection between the two. Rather, both she and her opponents emphasized some findings and rejected others on largely extrascientific considerations. In the absence of an accepted research paradigm, their criteria were largely ideological—seeing woman either as civilized animal or as mind presiding over a passive, nutritive body.

But perhaps even the accumulation of fact, even the coherent and powerful modern paradigm of reproductive physiology in contemporary medical texts, offers but slight restraint on the poetics of sexual difference. Indeed, the subject itself seems to inflame the imagination. Thus, when W. F. Ganong's 1977 *Review of Medical Physiology*, a standard reference work for physicians and medical students, allows itself one moment of fancy it is on the subject of women and the menstrual cycle. Amidst a review of reproductive hormones, of the process of ovulation and menstruation described in the cold language of science, one is
quite unexpectedly hit by a rhetorical bombshell, the only lyrical moment linking the reductionism of modern biological science to the experiences of humanity in 599 pages of compact, emotionally subdued prose:

Thus, to quote an old saying, “Menstruation is the uterus crying for lack of a baby.”

Cultural concerns have free license here, however embedded they may be in the language of science. As in nineteenth-century texts, synecdochic leaps of the imagination seem to view woman as the uterus, which in turn is endowed, through the by now familiar turn of the pathetic fallacy, with feelings, with the capacity to cry. The body remains an arena for the construction of gender even though modern research paradigms do, of course, isolate the experimental and interpretive work of reproductive biology from extrascientific pressures far more than was possible in the essentially preparadigmatic research of the nineteenth century.67

Scientific advances, I have argued, did not destroy the hierarchical model that construed the female body as a lesser, turned-inward version of the male, nor did it banish female orgasm to the physiological periphery. Rather, the political, economic, and cultural transformations of the eighteenth century created the context in which the articulation of radical differences between the sexes became culturally imperative. In a world in which science was increasingly viewed as providing insight into the fundamental truths of creation, in which nature as manifested in the unassailable reality of bones and organs was taken to be the only foundation of the moral order, a biology of incommensurability became the means by which such differences could be authoritatively represented. New claims and counterclaims regarding the public and private roles of women were thus contested through questions about the nature of their bodies as distinguished from those of men. In these new discursive wars feminists as well as antifeminists sacrificed the idea of women as inherently passionate; sexual pleasure as a sign in the flesh of reproductive capacity fell victim to political exigencies.

Notes

2. Ibid., 98; see, for example, Sade’s Philosophy in the Bedroom, trans. Richard Seaver and Austyn Wainhouse (New York, 1965), 206 and passim.
4. “There is a jouissance proper to her, to this ‘her’ which does not exist and which signifies nothing”; Jacques Lacan, “God and the Jouissance of the Woman,” in Feminine Sexuality, ed. Juliet Mitchell and Jacqueline Rose (New York, 1982), 145.


8. George W. Corner, “The Events of the Primate Ovarian Cycle,” *British Medical Journal*, no. 4781 (23 August 1952): 403. On older views of the fertile period of the menstrual cycle see, for example, the Roman Catholic authority Carl Capellmann, *Fakultativ Sterilität ohne Verletzung der Sittengesetze* (Aachen, 1882), who taught that days fourteen to twenty-five are “safe” while fertility rises just before the menses and continues until day fourteen. Marie Stopes, in her immensely popular manuals *Married Love* (10th ed., London, 1922), 191, and *Contraception* (London, 1924), 85, advised that maximum fertility occurs just after cessation of the menses. For the popularity of these views well into the 1930s see Carl G. Hartman, *Time of Ovulation in Women* (Baltimore, 1936), 149 and passim.

9. For an early and clearly presented table of embryological homologies, see Rudolf Wagner, ed., *Handwörterbuch der Physiologie*, vol. 4 (Braunschweig, 1853), s.v. “Zeugung,” 768. Regarding skeletons, see Londa Schiebinger, “Skeletons in the Closet: The First Illustrations of the Female Skeleton in Eighteenth-Century Anatomy,” in the current issue. 1759 is an alternative date for the first representation of the female skeleton; see ibid.


17. Hippocrates, *The Seed*, 319; for Galen on wet dreams in women see *De semine* 2.1, in *Opera omnia*, 4:599. There is no space in this paper to argue for the basic compatibility of Aristotle’s views with what became the dominant Galenic model. Despite Aristotle’s denial of female semen, he nevertheless construed the catamenia, i.e., the female
contribution to generation, as a less highly concocted version of semen and conversely argued that men who had copulated too frequently, and thus had spent their vital heat, ejaculated blood, of which semen was a higher concoction; both blood and semen are interpreted as residues of the concoction of food. Aristotle's hierarchy of fluids based on vital heat is thus congruent with Galen's, and their differences concern the efficacy of the female contribution; *Generation of Animals* 726b1–15, 35; 737a27–29. Though Aristotle argues that neither female orgasm nor the emissions of women in dreams are proof of female semination, he nevertheless holds that female pleasure normally is a sign of heat sufficient for generation; women can conceive without pleasure if "the part chance to be in heat and the uterus to have descended." These are not normal circumstances; ibid., 739a20–35. For an extraordinarily lucid account of these matters see Michael Boylan, "The Galenic and Hippocratic Challenges to Aristotle's Conception Theory," *Journal of the History of Biology* 17, no. 1 (Spring 1984): 83–112.


20. The earliest version of the hemorrhoidal bleeding/menstruation equivalency I have encountered is in Aristotle *Generation of Animals* 27a10, where he notes that women in whom the menstrual discharge is normal are not troubled with hemorrhoidal bleeding or nosebleeds. See J. B. [John Bulwer], *Anthropometamorphosis: Man Transformed of the Artificial Changling* (1653), 390; and Albrecht von Haller, *Physiology: Being a Course of Lectures*, vol. 2 (1754), paragraph 816, p. 293, my emphasis. For further clinical notes on the connection between menstrual and other bleeding see John Locke, *Physician and Philosopher...with an Edition of the Medical Notes*, Wellcombe History of Medicine Library, n.s., vol. 2 (London, 1963), 106, 200. Herman Boerhaave, *Academical Lectures on the Theory of Physic* (1757), paragraph 665, p. 114, cites the case of "a certain merchant here at Leyden, a Man of Probity, who discharges a larger Quantity of Blood every Month by the haemorrhoidal arteries than is discharged from the Uterus of the most healthy woman"; John Keegan, *The Face of Battle* (London, 1976), 337.

21. Avicenna *Canon* 3.20.1.44; Trotulla of Salerno, *The Diseases of Women*, ed. Elizabeth Mason-Huhl (Los Angeles, 1940), 16–19; on witchcraft and barrenness see Nicholas Fontanus,*The Woman's Doctor* (1652), 128–37, for a discussion of barrenness generally and the signs of too much or too little heat; Jacob Rueff, *The Expert Midwife* (1657), book 6, p. 16 (on witchcraft) and p. 55 (quote). Leonard Sowerby, *The Ladies Dispensatory* (1652), 139–40, gives a list of materials to "cause standing of the yard"; see Lazarus Riverius, *The Practice of Physick* (1672), 503 (on lack of lust being sign of cold and un receptive womb) and 502–9 (generally on the diagnosis and cure of barrenness).


24. Euchar Roesslin, *The Byrth of Mankynde* (1545), fol. 28. This text, or thinly disguised versions of it, was widely reprinted in large numbers of vernacular and Latin editions; the trope of a succession of children as a merciful God’s comfort for the sting of death was often attributed to St. John Chrysostom, presumably to Homily XVIII on Gen. 4.1, “And Adam Knew Eve as His Wife.”

25. J. B. de C. M.-Saunders and Charles D. O’Malley, *The Anatomical Drawings of Andreas Vesalius* (New York, 1982), point out that figs. 2 and 3 were drawn to illustrate the Galenic homologies while the penis-like vagina in fig. 4 is simply an artifact of having to remove the organs in a great hurry. A useful table of the homologies Vesalius sought to illustrate are given in L. R. Lind, ed., *The Epitome of Andreas Vesalius* (New York, 1949), 87. These representations became the standards for more than a century in both popular and learned tracts; see for example Alexander Read, *A Description of the Body of Man* (1634), 128, for an English version; and Fritz Weindler, *Geschichte der gynäkologische-anatomischen Abbildung* (Dresden, 1908).


30. Helkiah Crooke, *A Description of the Body of Man* (1615), 250; Thomas Vicary’s work is also known as *The Englishman’s Treasure* (1585), 53.

32. Havelock Ellis, *Studies in the Psychology of Sex*, vol. 3 (Philadelphia, 1923), 194; the phenomenon Ellis observes is, I suggest, of eighteenth-century origins.

33. Cited in V. C. Medvei, *A History of Endocrinology* (Boston, 1982), 357; Haller, *Physiology*, paragraphs 823–26, pp. 301–3. Haller, at the time he wrote these passages, was an ovist; that is, he believed that the egg contained the new life and that the sperm merely activated its development. But the same sorts of accounts were also written by spermaticists.


38. Ibid., 357–58, 362–63; my emphasis.


43. Ibid., 145 and part 2, question 2, generally.


politically as the domestic ideologists and Mary Wollstonecraft as engaged in the same moral enterprise.


58. Adam Raciborski, Traité de la menstruation (Paris, 1868), 46–47 and 43–47 generally; his De la puberté et de l'âge critique chez la femme (Paris, 1844) was often cited, along with Bischoff, as having established the existence of spontaneous ovulation in humans; orgasme was primarily a medical term in the nineteenth century meaning an increase of vital energy to a part often associated with turgescence (see Littre, s.v. "orgasme"); the first use I have found of the term estrous to refer to the reproductive cycle of humans as well as other mammals is in Walter Heape, "The 'Sexual Season' of Mammals and the Relation of the 'Proestrum' to Menstruation," Quarterly Journal of the Microscopical Society, 2nd ser., 44, no. 1 (November 1900): 1–70 and esp. 29–40.


61. Rudolph Virchow, Der puerperale Zustand: Das Weib und die Zelle (1848), 751, as cited in Mary Jacobi, The Question of Rest for Women During Menstruation (New York, 1886), 110. According to Michelet (L'Amour, 393), the ovary was of course not the only source of woman's fundamental sickness: "Ce siècle sera nommé celui des maladies de la matrice," he argues, having identified the fourteenth century as that of the plague and the sixteenth as that of syphilis (iv). See Thérèse Moreau, Le Sang de l'histoire (1982); A. Charpentier, Cyclopedia of Obstetrics and Gynaecology, trans. Egbert H. Grandin (New York, 1887), part 2, p. 84; for Pfluger see Hans H. Simmer, "Pfluger's Nerve Reflex Theory of Menstruation: The Product of Analogy, Teleology and Neurophysiology," Clio Medica 12, no. 1 (1977): 57–90, esp. 59.

62. Jacobi, Question of Rest, 1–25, 81, and 223–32 passim.

63. Ibid., section 3, pp. 64–115, is devoted to laying out and criticizing the so-called ovarian theory of menstruation.

64. Ibid., 98–100. 65. Ibid., 83, 165; emphasis is in the text.

66. Ibid., 99, 167–68.