“Persistence” versus “Periodicity”  

*From Puberty to Adolescence in the Late-Nineteenth-Century Debate over Coeducation*

During the last three decades of the nineteenth century, a cultural fervor ensued over the merits and detriments of “identical coeducation.” Coeducation referred to either educating boys and girls together or, if they were educated separately, using the same methods and purposes. It became a lightning rod in the late Victorian era because of a constellation of anxieties about gender roles and identities and their relationship to social change and “racial” progress. The essence of this debate was not new. Indeed, since the founding of the republic, the issue of female education—whether to educate girls, by what means, and to what ends—had been repeatedly engaged by intellectuals, pedagogues, theologians, and reformers. What was new in this latest incarnation of the ongoing debate was the influence of the current climate of developmental thinking based on the authority of biological science. So noticed Mary Putnam Jacobi, one of the key participants in the late-nineteenth-century debate over coeducation. In attempting to clarify the effects of evolutionary thought on contemporary conceptions of womanhood, she wrote: “A remarkable change has taken place in the tone of habitual remark on the capacities and incapacities of women. Formerly, they were denied the privileges of an intellectual education, on the ground that their natures were too exclusively animal to require it. Today, the same education is still withheld, but on the new plea that their animal nature is too imperfectly developed to enable them to avail themselves of it.”

Jacobi’s observation amounted to an indictment of the dominant scientific and “habitual” interpretation of evolutionary theory that rendered woman biologically inferior to man. According to this reading of Darwin, woman was so
determined by her bodily forms and functions as to be “too exclusively animal” to be capable of exercising the highest powers of reason, self-control, and self-assertion possessed by the occupant of the pinnacle of the evolutionary hierarchy, the western, white middle-class—or “civilized”—male. In this scheme in which perfection was determined by biological fitness, however, woman was now also depicted as imperfectly animal, with deficiencies in her phylogenetic and ontogenetic development accounting for her subordinate place on the evolutionary ladder. As a scientist steeped in developmental thought, Jacobi weighed in on the coeducation debate with an account of development in the individual human female that strove to sever her supposed closer connections to animals on the evolutionary continuum and to attribute an equivalent degree of biological fitness to her essential animal nature. Challenging the prevailing trend in the biological as well as the emerging psychological sciences of the time, Jacobi refused to see the female mind as overdetermined—and therefore limited—by the female body. Her refutation, however, was likewise grounded in the authority of biological science, in alternative conceptions of female physiology and of the changes that occurred in it over the course of the life cycle.

Such uses of developmental thinking in the debate over coeducation contributed to the further emergence of scientific and cultural conceptualizations of adolescence at the end of the nineteenth century. The work that sparked the intense debate over coeducation in the United States was the 1873 treatise by prominent physician Edward H. Clarke entitled Sex in Education, a widely popular book that was reprinted seventeen times in thirteen years. Historians have previously placed Clarke’s work in the context of the history of women’s education, determining how educational policies, programs, and practices, as well as young women’s attitudes, were shaped (or not) by Clarke’s directives. This chapter will focus on Clarke’s concerns with the physical, mental, and emotional growth of the child and locates the work within the emerging intellectual tradition of child development studies. Here, I will attend to the major influences on Clarke’s ideas—to evolutionary science, particularly the developmental theories of Herbert Spencer, and to the reigning understanding of the menstrual cycle in reproductive medicine. I will then turn to the outpouring of responses to Sex in Education for the ways in which Clarke’s conception of what he termed, interchangeably, the “epoch of development” and the “sexual epoch” was challenged and revised by his opponents in the coeducation debate. Jacobi’s work figures notably here as the most scientifically authoritative alternative to Clarke’s understanding of puberty and adolescence for a late-nineteenth-century audience.

The convergence of evolutionary science and reproductive medicine in
Clarke’s work countered and temporarily eclipsed the potentially enabling accounts of female development proffered by the health reformers of the antebellum period. In the descriptions of the developmental process advanced by the opponents of coeducation, male puberty, when it was discussed at all, was reasserted as a time of steady, protracted, harmonious growth, with its gradual and prolonged nature deemed to be the source of the superior development of the boy’s body, mind, and character. Girls’ bodies, in contrast, grew too fast, too soon, and with great demands placed on them. This precluded their advanced intellectual and moral development and turned puberty into an experience of pronounced somatic vulnerability and emotional volatility. Women’s rights advocates, educators, and some doctors protested these accounts and advanced their own alternative explanations of female development. Significantly, one such alternative suggested that insofar as puberty was characterized by vulnerability and volatility, these were not qualities of gender, but of age (as well as race and class), and so were shared by all civilized girls and boys undergoing the stage of life that some were now beginning to refer to as “adolescence.”

The late-nineteenth-century coeducation debate was prompted by the growing claims of white middle-class young women to the male prerogatives of higher education and to the life beyond the home that educational opportunity portended. During the first half of the nineteenth century, economic, social, and cultural changes gave rise to a dramatic influx of white middle-class northeastern girls, in particular, into newly established public and private primary and secondary schools. Conservatives warned that educating girls would endanger the natural separation between man and woman’s spheres. More persuasive and more vocal, though, were the proponents of female education, among them the pioneering founders of female seminaries Catharine Beecher, Mary Lyon, and Emma Willard, who assured that education would not undermine the identity and purpose of the true woman but would rather strengthen girls’ ability to perform their future roles as wives and mothers. According to this justification, girls needed to be rigorously educated so that they would be prepared to teach children, in the home and in the classroom, the republican principles and Christian values that were the foundation of the greatness of the new American nation. The rhetorical links between female education and domesticity were strong and certainly had some effect on institutional policies and practices, as well as on the ways in which girls experienced and made sense of their education. As Jane H. Hunter illustrates, however, conservative fears of female education were not entirely unfounded, as schooling “laid down self-expectations and
experiences which would profoundly unfit [girls] for domestic subordination.”

The unintended consequences of female education notwithstanding, given the range of middle-class family needs that could be met by sending girls to school and girls’ own enthusiasm for student life, the question by midcentury became not whether girls should be educated but how to educate them.

In 1850, most public elementary schools, or “common schools,” the majority of which were one-room schools in rural communities, were coeducational. Such arrangements were made most often in the interest of efficiency and cost. In most locales, it was simply not possible or practical to fund separate institutions for girls and boys. Coeducation in common schools was also acceptable because it mirrored the “natural” mixed sex relationships that abided in the family. In addition, given the limited mission of the common school—to teach children basic literacy skills and to instill in them a set of “universal” moral values and civic virtues—and in keeping with Victorian acceptance of androgynous childhood, many educators and parents remained largely untroubled by prepubertal girls and boys learning a similar curriculum together and in the same fashion. For all of these reasons, coeducation was practiced in, but not much discussed in relation to, rural common schools.

However, coeducation in urban public schools, particularly high schools became a matter of dispute in a number of cities at midcentury, including Boston; Washington, DC; San Francisco; St. Louis; and Savannah. Urban public schools were larger and more diverse in terms of class and ethnicity than rural schools, although in most secondary schools, sons, and especially daughters of the middle class, predominated. Urban school were also more bureaucratized and more standardized than rural schools, creating a context for school administrators to formulate uniform and centralized policies about coeducation, which set the stage for the debate. The dialogue about the detriments and merits of coeducation took place among school officials in local communities, where policy decisions were made, as well as in broader professional forums, including state teachers’ associations, the reports of state superintendents, and the meetings and publications of the National Educational Association. Opponents of coeducation voiced many arguments against the practice. They cautioned that pure and delicate teenage girls would be corrupted by too much contact with the opposite sex, particularly with indecorous working-class and immigrant boys. They feared that male teachers would be forced to discipline boys and girls according to similarly harsh methods (this despite a predomination of female teachers and a shift away from the uses of corporal punishment). Gesturing to increasing evidence that girls were outperforming boys in schools of all kinds, they argued
that boys’ lower academic standards would impede girls’ mental advancement. And, they worried that educating girls with their brothers and in similar fashion would make them “like boys,” unable or unwilling to fulfill their “natural” domestic functions that were so important for sustaining and advancing “civilized” society.

In addition to propagating practical arguments for economy and bureaucratic efficiency, some coeducation advocates responded by idealistically defending the lofty goals of public education. Public schools were meant to provide all children with equal education; mixing classes and sexes in the classroom was deemed to be central to their mission. They also maintained that coeducation held out moral and pedagogical benefits for both sexes. Girls and boys educated together would moderate the excesses of masculinity and femininity in each sex, creating more balanced characters as youths matured. In addition, regular academic engagement between girls and boys would reduce sexual tension and enhance the respect of each sex for the higher qualities and characteristics of the other. And, the different learning styles of each sex—girls more receptive and concrete thinkers, boys more critical and abstract—would facilitate the intellectual progress of both. Following the Seneca Falls Declaration of Sentiments of 1848, which denounced women’s lack of access to higher education, a small group of women’s rights advocates voiced the argument, as others had since the founding of the republic, that equal education was essential for women to claim the full political, social, and economic rights to which they were entitled as citizens in a democracy. The school administrators who voiced support of coeducation did not go that far, however. Like most of the supporters of female education before them, they contended that girls ought to be educated with and in the same manner as boys so as to foster the highest potential of their sexual difference.

By the 1870s, coeducation in secondary schools was not settled, even as the practice was becoming firmly entrenched. The debate took on even greater urgency in the post-Civil War decades, however, as young women entered what had been the almost exclusively male preserve of higher education. The first experiments in collegiate coeducation were carried out in the antebellum period at Oberlin and Antioch colleges, founded by evangelical Christians in 1833 and 1853, respectively. At both institutions, male and female students were separated in their extracurricular activities and social encounters, policies that some women students protested. From the perspective of the schools’ founders, separatism signaled respect for women’s differences, and their presence on campus was meant to elevate young men to the same standard of piety and social behavior as their sisters. Even so, presidents of both colleges in the late 1850s
expressed doubts that such a goal had been achieved at their own institutions or that it could be at other establishments less religiously inclined than theirs. During the Gilded Age, a number of public and private colleges and universities began admitting women, but not without struggle. According to historian Lynn D. Gordon, "Collegiate coeducation usually did not come about naturally or because of American democratic traditions." Rather, "[a]ccess to higher education . . . became a reality when women themselves—mothers, civic leaders, potential students, or women's rights advocates—pressed state and university officials to open the doors of colleges and universities." A number of prestigious women's colleges were founded during this time, mostly in the East and the South. Modeled on female seminaries, which emphasized the distinctly feminine contributions educated women were to make to society, Vassar, Smith, Wellesley, Sophie Newcomb, and Agnes Scott colleges also established the highest standards of academic rigor for their female students. As with coeducational colleges and universities, these institutions came under immediate criticism from those who argued that their seminary orientation overly constrained female students and from those who believed their intellectual focus threatened young women's femininity.

The perception that female education, whether coeducational or single sex, either portended great possibility or peril for girls and society was heightened during the Gilded Age in the face of tremendous flux in the Victorian gender, class, and racial order. During the last decades of the nineteenth century, forces of industrialization, immigration, and urbanization were forging the United States into a modern nation. Class and race relations were marked by intense conflict as members of the working class, various ethnic groups, and African Americans struggled to claim equal rights and opportunity against the nearly insurmountable odds of economic exploitation, nativism, and racial discrimination. At the same time, middle-class white adult women, many of whom had secondary or some college education, challenged the limits on their autonomy the ideology of separate spheres placed on them. Instead they pursued professional careers, participated in the fledgling campaign for woman suffrage, and organized and joined clubs devoted to self-improvement and social reform. Although education, the engagement in public activities, and women's rights intersected in varied and complex ways in individual middle-class white women's lives, these were perceived as indelibly linked in the minds of those who raised and pondered the late-nineteenth-century "woman question." As important were the connections such women made between their status as civilized women, with a superior racial capacity for moral agency, and their right and responsibility to assume
public authority over racial and ethnic minorities and the working class. In this way, white middle-class women’s gender transgressions opposed patriarchy, while also serving to buttress class, racial, and religious hierarchies in a nation striving for territorial expansion, commercial dominance, and cultural ascendancy at home and abroad.15

At the same time, the shift to a corporate, consumer-oriented capitalism, and the serious economic depressions that accompanied it in the 1870s and 1890s, was making it difficult for white middle-class men to exercise the manly virtues of autonomy and self-control that were the hallmarks of maturity and the prerequisites for full citizenship rights in the early republic. These threats to white middle-class manhood were exacerbated by the contentions for political and economic power by working-class, immigrant, and African American men, as well as by white middle-class women. In response, as historian Gail Bederman demonstrates, white middle-class men “remade manhood” in the years between 1880 and 1917, assuming a new set of powerful, “primitive” “masculine” traits that sought at once to resist the enervating effects on their manhood by the forces of modern life and “to ensure the continued millennial advancement of white civilization.”16 In the face of such momentous change, the stakes of the girl’s education were deemed to be higher than ever before. To make the case about whether this was for good or ill, both opponents and proponents of identical coeducation marshaled the resources of the increasingly authoritative biological sciences. In the process, they constructed new knowledge about the development of the child and helped to formulate the modern category of adolescence.

 **CLARKE’S EPOCH OF SEXUAL DEVELOPMENT**

Edward Clarke first opined against young women joining the collegiate student body in a speech before the New England Women’s Club in Boston in 1872. Clarke, a member of Harvard’s Board of Overseers and a former member of its medical faculty, was invited to speak by women’s rights advocate Julia Ward Howe, under the assumption that he would endorse women’s right to higher education. Indeed, three years earlier, Clarke had suggested that if women proved capable of training themselves to be physicians, they should be allowed to do so. To the dismay of many of his listeners at the New England Women’s Club, Clarke now clarified his position on the matter, asserting that woman’s distinctive physiology, the center of which was her reproductive function, prevented her from succeeding in any program of higher education, medical, or otherwise. He
explained that women were innately unfit for the rigors of higher education, while they were supremely equipped for the roles of wife and mother, made possible by their unique biological endowment. Club members engaged Clarke in heated discussion following the address. Somewhat taken aback by his audience’s response, he decided to explicate his argument more fully in a book, published the next year as *Sex in Education*, which was rather disingenuously subtitled, *A Fair Chance for the Girls.* This was followed in 1874 by a sequel dealing with similar themes, *The Building of a Brain.*

That the womb and the ovaries dominated the life of the woman, determining her physical capacity, mental ability, emotional temperament, and consequently her social role and responsibilities, was a commonplace belief in nineteenth-century medicine. Met with the growing incursions by white middle-class girls and women into the public realms of schooling, work, and politics in the post–Civil War years, Clarke’s contribution to the conservative scientific justification for separate spheres renewed claims about female destiny by recasting that destiny in relation to the processes of individual development. According to Clarke, it was the extraordinary demands of the growth of the female reproductive system during the teenaged years that necessarily interfered with female educational opportunity. His argument drew from the latest innovations in evolutionary science and reproductive medicine. He began, though, with a long-extant model of the female life span that divided the life of the woman into three eras: childhood, from birth to the early teens; maturity, from the early teens to age 45; and old age, from age 45 until death. Such a model prescribed the process of female maturation as marked by the continuous unfolding of a singular destiny, with younger females lacking a distinct identity of their own and instead occupying the position of “little women.” However, Clarke also altered this older formula by revisioning, and granting enormous significance to, the period of transition from childhood to maturity, which spanned from age 14 to 20. Like the antebellum health reformers, Clarke was intent on disassociating the phenomenon of puberty from the achievement of maturity. He then went on to endow puberty as the key determinant of the personal attributes of the girl, the mandates of girlhood, and the girl’s future physical and psychological health. As a result, he made a case for a distinct and extended period in the girl’s life in which she was neither a child nor a woman, a period when the occurrence of sudden and critical physiological changes gave rise to sexual difference, circumscribed the capacity for mental activity, prompted the emergence of a peculiar emotional temperament, and determined the quality of the stages of the life cycle to follow.

As were most scientists and intellectuals of his day, Clarke was influenced by
the theories of biological and social evolution of Charles Darwin and Herbert Spencer, particularly their explanations of the cause of sexual difference in the development of the human species and its importance for the advancement of western civilization.\textsuperscript{20} In *The Descent of Man*, published just before Clarke’s work in 1871, Darwin explained how the two fundamental phylogenetic principles he formulated in *On the Origin of Species* (1859), natural selection and sexual selection, applied to the evolution of human beings and gave rise to sexual difference. The human male, he posited, possessed superior physical strength, intelligence, endurance, inventiveness, and courage because he led the way in the struggle for survival and, early in the evolution of the species, was also engaged in competition with rivals for mates. In contrast, the female of the species, characterized by a slower metabolic rate and a natural dependency on the male due to the demands of human motherhood, was unable to benefit fully from the forces of natural selection. Consequently, she failed to develop the highest forms of mental acumen and therefore displayed less intellectual variability than the male. More emotional and intuitive in her ways of knowing and being, the human female also possessed greater tenderness and benevolence because of her role as the primary caretaker of children. The laws of heredity, as Darwin explicated them, worked in conjunction with these principles. Thus, traits that the individual acquired early in life, such as physical size, were the product of natural selection and were transmitted, although not developed, in both sexes. Traits arriving later in life, most especially mental abilities, were the product of sexual selection and were imparted only to offspring of the same sex. Spencer’s widely discussed article, “Psychology of the Sexes,” published in 1873 in *Popular Science Monthly*, provided similar analysis of the cause of sexual difference in human evolution. More popular than Darwin, historian Louise Michele Newman asserts, “Spencer gave his version [of evolutionary theory] a sharply teleological cast, asserting that evolutionary changes occurred so as to produce social and racial progress, leading to ever higher and more advanced civilizations and races.” A whole array of evolutionary thinkers followed Darwin and Spencer to link sexual difference with evolutionary progress, contending that sexual divergence was both sign and cause of the superiority of the white race.\textsuperscript{21}

If Clarke accepted these analyses of the constitution of sexual difference on the level of the species, the particulars of the establishment of sexual difference in individual human development, and indeed of individual human development itself, remained open for further scientific explanation. Darwin’s model of species development as gradual, continual, and adaptive posed fundamental and enduring questions for the modern scientific study of child development—questions
about the role of history in the life of an organism, the relationship between an organism and its environment, and the connection between the evolution of species and individual development. How “revolutionary” his effect on child development studies was, however, remains a matter of some debate.\textsuperscript{22} Scholars of developmental psychology Roger A. Dixon and Richard M. Lerner both recognize and qualify Darwin’s contributions to their field. It was, they offer, “the intellectual climate of historical or evolutionary thinking—a climate that . . . both preceded Darwin and gained impetus from him and that, in some ways, was epitomized by him—[that] is an originative core of developmental psychology.”\textsuperscript{23} Darwin was influenced by the work of two scientists whose ideas linked individual development with the evolution of species or ontogeny with phylogeny.\textsuperscript{24} The first was Karl Ernst von Baer’s findings from comparative embryology that embryos of different species resembled one another in their earliest stages, becoming more differentiated as they developed. The second was Jean-Baptiste Lamarck’s theory of acquired characteristics, which posited that traits attained during the individual’s lifetime could be passed on genetically to the next generation.\textsuperscript{25} He also showed some specific interest in ontogeny when in 1838 he raised questions in his notebooks about the emotional development of infants. The following year he started a baby diary to record observations of his infant son, which was published in 1877 in the journal \textit{Mind} as “A Biographical Sketch of an Infant.” Nonetheless, Darwin’s primary scientific concern remained changes in species over long periods of time and not changes over time in the life of the individual.\textsuperscript{26}

Beyond Darwin, it was the highly popular theories of “individual evolution” articulated by Spencer that directly influenced the ideas about child development and the concepts of puberty and adolescence that were deployed by Clarke and contested by his opponents in the coeducation debate. Spencer’s “doctrine of evolution” was founded on the law of conservation of energy, which he referred to as the “persistence of force.” Proceeding from the physical laws of matter and motion, and indebted as well to von Baer’s formula for change, he defined evolution as the natural process by which all phenomena—individual organisms, species, societies, the cosmos—changed from a condition of homogeneity to a condition of heterogeneity and differentiation. Although such change was not inevitable and could be assisted or impeded by external forces, nature intended it to be progressive, a process of moving the developing entity toward a superior state of “individuation,” “integration,” and “equilibriation.” For Spencer, coiner of the phrase, the “survival of the fittest,” and leading architect of Social Darwinism, the most advanced human beings in the most advanced social state would
be free from all external restraints, while their supremely evolved moral sense would ensure their voluntary cooperation with one another and generate peace and harmony in the whole. Thus, evolution marked the “gradual advance towards harmony between man’s mental nature and the conditions of his existence,” the ultimate end of which could only be “the establishment of the greatest perfection and the most complete happiness.”

Key to Spencer’s appeal was the synthetic nature of his philosophy. Evolution, he contended, occurred simultaneously among the “several orders of existences,” not as “many metamorphoses similarly carried on” but as “a single metamorphosis universally progressing.” That such change occurred at all was perhaps no better illustrated than in the transformations that took place in the individual human being from conception to adulthood: “In an individual development, we have compressed into a comparatively infinitesimal space, a series of metamorphoses equally vast with those which the hypothesis of evolution assumes to have taken place during those immeasurable epochs that the Earth’s crust will tell us of . . . If a single cell, under appropriate conditions, becomes a man in the space of a few years; there can surely be no difficulty in understanding how, under appropriate conditions, a cell may, in the course of untold millions of years, give origin to the human race.” Ontogeny was important in Spencer’s scheme because it followed and illustrated the universal laws of biology and physics governing all natural and social phenomena. Given his acceptance of Lamarck’s theory of acquired characteristics, individual evolution was also important because of its dynamic relationship to both phylogeny and progressive social change.

Spencer dealt most pointedly with themes related to child development in his 1860 work *Education: Intellectual, Moral, and Physical*, which was his first book published in the United States and certainly among the most read of his publications. Asserting that “the development of children in mind and body rigorously obeys certain [natural] laws,” he recognized that he was building on the organic developmental theories of early-nineteenth-century educational reformers, most notably those of Swiss pedagogue Johann Pestalozzi, a follower of Rousseau. He also criticized Pestalozzi for failing to systemize his thought and condemned him and his followers for “the numerous crudities and inconsistencies” in the educational methods by which the Pestalozian doctrine was carried out. “These general notions” of development and education held by Pestalozzi and others, Spencer averred, “must be developed in detail,—must be transformed into a multitude of specific propositions, before we can be said to possess that science on which the art of education must be based.” That science was, of course, evolu-
tion, whose general principles had to be grasped and followed by parents and teachers if “serious physical and mental defects” in the child’s development were to be avoided and “a perfect maturity” achieved. Rhetorically wondering why, if there existed in the organism itself “a prompter to the right species of activity at the right time,” children should not be left “wholly to the discipline of nature,” Spencer recognized and offered a resolution to the paradox of the organic developmental paradigm. Development dictated the course of education, but education was also necessary, particularly in complex organisms dependent on parents for long-term survival, to maintain “the conditions requisite to growth,” and even, if carried out without any coercion, to facilitate actively the fundamentally spontaneous process of individual evolution.

Conforming to evolutionary principles in intellectual education meant that lessons should “proceed from the simple to the complex” and “start from the concrete and end in the abstract” because, Spencer explained, the mind, like all phenomena, grew progressively “from the homogeneous to the heterogeneous.” Drawing on the recapitulation tradition in evolutionary thought, which held that the development of the individual passed, in linear, progressive fashion, through all the lower stages of life of its ancestors, he also contended that the education of the “civilized” child should follow the same “order in which the human race has mastered its various kinds of knowledge.” For Spencer, such an order was revealed in the mental capacities of living adult peoples of primitive races, whose simple environmental conditions had arrested their intellects at lower stages of development. Following evolutionary principles in mental education also meant that learning should be propelled from children’s own self-directed inclinations, as free as possible from the management of others. Children “should be told as little as possible and induced to discover as much as possible,” he argued, for self-instruction was the primary impetus for human progress. If this occurred, the final requirement of intellectual education would be met—that it be an enjoyable and exciting endeavor for the child. This would, in turn, provide impetus for more advanced learning, which was the source of the further advancement of civilization.

Spencer’s descriptions of moral development and prescriptions for moral instruction followed these same evolutionary principles. Parents should not expect a great deal of moral goodness from young children, he advised, since such youngsters were as yet in a “barbarous” phase of character development, when tendencies toward selfishness, cruelty, and dishonesty abided. Nor should parents try to force their children’s virtue too soon, for the higher moral faculties, as the higher intellectual ones, were acquired late in the evolutionary process and
could be reached only by “a slow growth,” which would be impeded by parents foolishly trying too soon to “make their children what they should be.” In matters of discipline, he recommended that parents be neither too lenient nor too strict and that they allow children to experience the “natural” consequences of their indiscretions. This was the only way to foster in them a rational sense of “pure justice” and cultivate in them the highest moral capacities of self-governance and voluntary cooperation with others. It also was the only system of moral governance that preserved the equanimity in the tempers of both parent and child and that encouraged “a much happier, and a more influential state of feeling” between them.

Given that parents themselves were morally imperfect (which manifested itself in their children genetically and in their unduly harsh modes of family governance) and given that the society in which children were being educated to enter was as yet morally imperfect, Spencer recognized that such an approach could be carried out only by increments but should be endeavored nonetheless: “It . . . follows that the dictates of abstract rectitude will, in practice, inevitably be subordinated by the present state of human nature—by the imperfections alike of children, of parents, and of society; and can only be better fulfilled as the general character becomes better.”

Spencer followed his essays on intellectual and moral education with an exposition on physical education, in which he made clear that the development of the body was the foundation upon which the perfection of the mind and character depended. “[T]he first requisite to success in life,” he insisted, “is to be a good animal; and to be a nation of good animals is the first condition to national prosperity.” With this as his premise, Spencer laid out one of the most important laws of child development enumerated in Education—the law of growth itself. The law of conservation of energy dictated that the body possessed a limited amount of vital energy and that overexertion in the development of one part would result in a depletion of energy available for the development of other parts. Of great concern to Spencer was that the early forcing of mental prowess might undermine children’s physical fitness “for the struggle before them.” Precocity and a potential conflict between the development of the child’s mental and physical powers had received much attention in earlier nineteenth-century developmental discourse and had figured into antebellum critiques of teaching methods and calls for physical education. Although Spencer acknowledged that the danger of precocity was becoming more recognized by parents and teachers, he again sounded these same alarms, reminding his readers that Nature was, indeed, a “strict accountant,” who must respond to any forcing of the young child’s mental proficiency by leaving “some of her more important work undone.”
Spencer went further than previous developmental thinkers, however, in positing the existence of an “antagonism” between growth, or “increase of size,” and development, or “increase of structure.” The law, he asserted, “is, that great activity in either of these processes involves retardation or arrest of the other.” Thus, the simple caterpillar was exclusively devoted to augmenting its bulk during its early stage of existence, turning into the complex butterfly only when, once in the chrysalis, growth ceased and development began. In the higher animals, Spencer conceded, these two processes seemed to be carried out simultaneously. Significantly, though, the workings of the law could still be observed in the differential development of the sexes. “A girl develops in body and mind rapidly,” he wrote, “and ceases to grow comparatively early. A boy’s bodily and mental development is slower, and his growth greater. At the age when the one is mature, finished, and having all faculties in full play, the other, whose vital energies have been more directed towards increase of size, is relatively incomplete in structure; and shows it in a comparative awkwardness, bodily and mental.”

Spencer made explicit the implications of this developmental difference in The Principles of Biology (1866) and, more succinctly and more accessibly, in the article “Psychology of the Sexes.” Here, he posited another antagonism, this one between “Individuation” and “Genesis,” by which he meant “growth, development, [and] activity,” on the one hand, and reproduction, on the other. The girl’s early growth spurt was necessary, he explained, so that she would have some vital energy remaining to meet the high “cost of reproduction” entailed in her role in the production of offspring. The price she paid for this, however, was that both her physical growth and her mental development were normally arrested at a level below that of the slower, more steadily and continuously growing boy, whose contribution to genesis exacted no significant expenditure of vital force and thus did not compromise his process of individuation. Alternatively, the girl who insisted on the pursuit of a “high-pressure education” was likely to experience an abnormal “deficiency of reproductive power” in any number of guises, including sterility, early menopause, and the inability to nurse offspring. In Spencer’s formulation, then, precocity, once understood as a condition visited on young children under the influence of misguided educators who failed to see the importance of physical education, was now determined to be an essential—and detrimental—attribute of female development. Smaller and weaker in body than her more slowly growing brother, the girl also never attained the complex mental and moral capacities for abstract reasoning and impartial justice that for Spencer were the latest—and greatest—“products of human evolution.”

In describing girls as normatively precocious, Spencer denied them passage
through youth, a stage of life that he deemed the exclusive province of civilized boys. Spencer’s conceptualization of youth echoed and furthered the ambivalence of earlier developmental thinkers. The civilized boy’s prolonged development, which rendered him uncomfortably awkward, immature, and dependent throughout his teenage years, was nonetheless both cause and effect of his superior evolutionary advancement. It was this dependence that made education and discipline necessary, ministrations that Spencer preferred to be executed by parents rather than potentially coercive social institutions. While recognizing the imperatives of adult guidance over the direction of youth, however, Spencer was also careful to specify the desired developmental outcome of the “active and elaborate course of culture” to which the boy was to be subjected. The primary goal of mental and moral education, he dictated, was to raise “free men,” who, in their capacities for intellectual innovation and self-governance would make possible the continued evolution of civilization. Such a goal required the exercise of as much self-direction and self-rule during youth as possible. “The association between filial subservience and barbarism . . . and the fact that filial subservience declines with the advance of civilization, suggest that such subservience is bad,” declared Spencer. “Whilst, on the other hand, a non-coercive treatment . . . must . . . accustom the child to that condition of freedom in which its after-life is to be passed.” Treating youth with greater latitude also promoted greater happiness in the young and genuine sympathy between fathers and sons, both of which forestalled destructive youthful rebellion and encouraged boys in the purposeful use of their freedom.

To this Lockean conception of youth, Spencer added his own evolutionary optimism. Youth required some measure of restraint in the current, transitional social state because they still possessed some of “the dispositions needed for savage life,” which were adaptive in an as yet imperfect society. The more the advancing social state called forth the exercise of freedom in the young, the less necessary control of any kind would become, and in turn the more capable the young would be of furthering social advancement. In a fully civilized society, then, education itself would become obsolete. At that point, “[t]he young human being will no longer be an exception in nature—will not as now tend to grow into unfitness for the requirements of after-life, but will spontaneously unfold itself into that ideal manhood, whose every impulse coincides with the dictates of moral law.” In neither the current social state nor the perfect one he imagined, however, did Spencer allow for the possibility of the girl’s full individuation. More mature and less developed than boys, girls were, paradoxically, less dependent on adult guidance and regulation because they came of age sooner than
boys, and far more so, given that they were biologically incapable of benefiting from the extended development and education that would promote their ultimate freedom.

Clarke employed Spencer’s theories of “individual evolution” to make his case against identical coeducation, although he downplayed female developmental deficiency in favor of the positive aspects of female difference. From the outset, he positioned himself against what he decried as a “new gospel of female development” that insisted on establishing the identity between the sexes. “The notion is practically found everywhere,” he lamented, “that girls and boys are one, and that boys make the one.” As did Spencer, Clarke ascribed to the view that as children, girls and boys were indeed “very nearly alike,” and that it was that sameness that allowed them to exist in an appropriate state of “innocent abandon that is ignorant of sex.” Late-nineteenth-century evolutionary theory bolstered, and was bolstered by, the longstanding notion of the late acquisition of sexual difference in ontogeny by maintaining that sexual divergence increased as human evolution progressed—the more advanced a culture, the greater the distinction between the male and female spheres of life. As in the biological and cultural evolution of the species, the thinking went, so in the development of the individual, and vice versa. According to Clarke, the careful observer could, of course, recognize even in the girl baby the “divine instinct of motherhood” in her gentle treatment of a doll “that her tottering brother looks coldly upon.” Likewise, that same infant boy could be seen breaking “the thin disguise of his gown and sleeves by dropping the distaff, and grasping the sword.” Nonetheless, as the antebellum health reformers before him, he recognized that there were dangers to the physical, mental, and moral development of the child when sexual difference was allowed to manifest too soon. All of that accounted for and understood, however, Clarke’s primary contention was that not nearly enough attention was being paid to the epoch of sexual development—the critical stage of life when, because of the biological changes that occurred with puberty, the sexes unmistakably diverged in their development and, consequently, in the requirements for their education.49

Imparting dichotomous gendered meanings to concepts Spencer used to describe the physical laws of matter and motion, Clarke characterized the pubertal development in the male as governed by “persistence” and described female pubertal development as dominated by “periodicity.”50 Before and during the teenage years, he maintained, both boys and girls were governed by the physiological principle that growth only occurred when more of the body’s cells were created than were destroyed. Accordingly, for both sexes, mental and physical
work had to be apportioned and accompanied by sufficient sleep and proper nutrition, so that repair exceeded waste, with a margin left for “general and sexual development.” In the teenage boy, however, sexual development was subsumed under the process of general development, with the male body and all of its parts growing “steadily, gradually, and equally, from birth to maturity.” Reiterating the formula for prolonged, harmonious growth that health reformers thought enabled the development of the boy into the autonomous man, Clarke’s analysis nonetheless stands out for its rendering entirely inconsequential the effects of male puberty on the boy’s growth process. Indeed, repeatedly throughout *Sex in Education*, he insisted that the momentous changes he described as occurring in the development of the pubertal girl had but “feeble counterpart . . . in the male organization.” Because Nature did not fundamentally transform the teenage boy’s mind or body, nor require anything special from him at this time of his life, Clarke concluded, he best developed “health and strength, blood and nerve, intellect and life, by a regular, uninterrupted, and sustained course of [mental and physical] work.”

Female development, Clarke argued, followed the male norm of slow, persistent, harmonious growth up until puberty. Then, because of “the larger size, more complicated relations, and more important functions, of the female reproductive apparatus,” sexual development came to dominate the course of general development, and the girl’s “engine within an engine” began a (normatively) regularly recurring reliance on the body’s limited vital forces. Whereas health reformers such as Blackwell and Fowler had used the concept of “periodicity” to refer to the proper timing of the emergence of a particular developmental capacity, Clarke’s terminology was meant to signify the predictable and unmanageable alterations in energy and mood characterizing the female’s body and mind with each menstrual cycle. Here, he selectively drew on the theory of “vital periodicity” established by English neurophysiologist Thomas Laycock, who, in a series of important papers published in *The Lancet* between 1842 and 1844, asserted that all physiological processes, including reproductive ones, were governed by regular temporal cycles. Clarke then applied the law of conservation of energy to the epoch at which the periodical reproductive function was first established. He asserted that since the body was unable to perform two functions well simultaneously nervous energy used for mental cultivation during this critical age diverted much-needed nervous energy away from the reproductive development process, thereby endangering the reproductive system, the nervous system, or both. For boys, pubertal development was a continuation along the same even, reliable, imperturbable, and linear path of growth they had always
known. For girls, it was marked by patterned conflict: a continual contest among the “constant demands of force” for general growth, the “equally constant demands of force” for education, and the “periodical demands of force” for the establishment and maintenance of the reproductive function.52

That the female expended vital nerve force during the menses that would precipitate a conflict in the pubertal girl had been a mainstay in reproductive medicine since the mid-1840s when the ovarian theory of menstruation achieved prominence. This was the basis for Spencer’s claim, and Clarke’s endorsement, that the “cost of reproduction” was higher for the female. Before the eighteenth century, when what historian Thomas Laqueur terms a “one-sex model” of human sexuality held sway, menstruation was seen as a generally harmless purging of plethora, similar to other forms of bodily self-management in men and women. Ovulation, with its analog in male ejaculation, was understood as occurring only during intercourse and was linked directly to both the experience of pleasurable orgasm and the achievement of conception. With the rise of a “biology of [sexual] incommensurability,” ovulation still retained its connections with intercourse, orgasm, and conception, although some doctors, trying to reconcile this with expectations for female passionlessness, supposed that women experienced these collective phenomena “without sensation.” Then, in 1843, Theodor von Bischoff discovered that dogs ovulated “spontaneously,” that is, independent of the act of coitus and during the regularly occurring estrus, or the rut. Despite the absence of any direct evidence about human ovulation, prominent naturalists and physicians quickly extended Bischoff’s findings to human females, and the result was a new and highly influential theory of ovulation and menstruation.53

Ovarian theory disassociated ovulation from intercourse and fecundation, correlating it instead with menstruation and the excitement of the nervous system. Keeping with the Victorian conception of the body as a mechanical system driven by nerve force, ovarian theorists supposed that it was the accumulated effect of irritation to the nerves of the ovary caused by the periodical enlargement and rupture of the ovarian follicles that produced the congestion of blood in the uterus and the ensuing menstruation. Rendered as an inner drama wholly unique to the female sex, the process was deemed to be analogous to the experience of heat in animals, with the sexual pleasure and autonomous passion once associated with ovulation giving way to the perception of a generalized “animal madness” afflicting the woman with each menstrual cycle.54

Moreover, if each menstruation was likely to induce in the woman a heightened nervousness and precipitate an inner conflict over limited vital forces, the
undue demands of the first menstruation(s) tended to hyperbolize such effects in
the teenaged girl. On this point, Clarke quoted the eminent British psychiatrist
Henry Maudsley: “In the great mental revolution caused by the development of
the [girl’s] sexual system at puberty, we have the most striking example of the
intimate and essential sympathy between the brain, as a mental organ, and other
organs of the body.” Ovarian theory described female puberty as commencing
with the rapid development of the ovaries and the sudden assumption of the
pattern of the discharge of ova, accompanied by the initial menstrual hemor-
rhages. While the phenomenon of female puberty was premised on the qualities
of haste and abruptness, however, the onset of these functions was also under-
stood to predate their regular establishment by several years. And, as Clarke
asserted, like all developmental mandates, “unless the reproductive mechanism
is built and put in good working order at that time, it is never perfectly accom-
plished afterwards.” The teenage girl was thus perceived as experiencing an
extended period of pronounced physical and mental vulnerability, during which
she was more prone to weakness and disease in the present, more at risk of
compromising her future health, and more susceptible, in exaggerated form, to
the feminine temperamental attributes of sensitivity, irrationality, melancholy,
inchoate sexual feeling, restlessness, and self-absorption.

Like all those who ascribed to ovarian theory, Clarke recognized the impor-
tance of the sudden and rapid female growth spurt in shaping the teenage girl’s
body, mind, and temperament. Unlike Spencer, though, who saw the girl’s pre-
cocity as a cause of female developmental inferiority, he was more interested in
the problem of how to secure “the best kind of growth during this period, and
the best development at the end of it.” Woman, for Clarke, was not to be looked
on as “as a nondescript animal, with greater or less capacity for assimilation to
man,” but as a distinctive being who was capable of a complete and perfect
development of her own kind, in her own way. Clarke’s pubertal girl was thus
neither a lesser boy nor precisely a little woman, in that she possessed a nature of
her own that demanded both explanation by scientists and understanding, re-
spect, and accommodation by the girl and those adults entrusted with her care.
Such ends were defied by identical coeducation, Clarke declared, which “put up
the same goal, at the same distance” for both sexes, and required them “to run
their race for it side by side on the same road, in daily competition with each
other, and with equal expenditure of force at all times.” In a section of his book
entitled “Chiefly Clinical,” he provided evidence of the invidious effects of such a
practice: a series of examples of teenage girls and young women suffering from
general paleness and weakness, menstrual disorders, dyspepsia, sterility, hysteria,
and nervous exhaustion, all consequences of the neglect or ignorance of the demands of the female organization encouraged by the pressures of identical coeducation. To forestall such suffering, Clarke proposed a “special and appropriate” educational regimen for the girl that provided for a moderate academic program for three-quarters of each month, which incorporated plenty of opportunity for exercise and rest, and required absolute remission from mental work during the week of the catamenial period. Education, he carefully explained to his readers, did not refer to “intellectual or mental training alone,” capacities at which girls had, admittedly, shown themselves to be quite proficient, but “the drawing out and development of every part of the system,” which “necessarily include[d] the whole manner of life, physical and psychical, during the educational period.” Thus did the periodicity of the girl’s nature require a similarly periodical routine to ensure its full and proper emergence.58

In Clarke’s formulation, it was only the western, white middle-class girl who warranted such assiduous protection during the teenage years. Only she was capable of experiencing the “best kind” of development and education that constituted an extended period of female youth with challenges, privileges, and responsibilities all its own, equal in value, if not in kind, to the stage of youth Spencer prescribed for the civilized boy. By virtue of both inferior heredity and less complex social environments, Clarke explained, the girls of the “Orient,” of the European peasantry, and of the American working class possessed desirable physical strength but not the refined physical, mental, and emotional natures that portended both great risk and significant possibility for their civilized counterparts.59 On the problem of the greater developmental peril faced by civilized girls, many fellow physicians joined Clarke in declaring that much was normatively, and uniquely, dangerous, difficult, volatile, vulnerable, and therefore limiting about their stage of pubertal development, even under the best of circumstances. He went further than many of his contemporaries in medicine, however, in also describing girls’ youthful female nature as potent, beautiful, and important, the source of their individual freedom and power, as well as their indispensable contribution to society and the race.60

With this latter point, all those opposed to coeducation could also agree. The primary responsibility of white middle-class women was to propagate healthy boys and girls in inheritance of those evolutionarily superior mental and moral traits that would propel the continued advancement of western civilization. Civilized girls who did not attend to the requirements of their organization were not only committing the “slow suicide” of themselves as individuals, Clarke warned, but “race suicide” as well, threatening the “non-survival of the fittest”
and the future reproduction of the race “from its inferior classes.” As evidence for such a claim, late-nineteenth-century opponents of coeducation pointed to census reports that showed a decline in white women’s fertility rates and a corresponding increase in the birth rates of immigrants and African Americans. By 1900, marriage rates among those who attended college were less than 50 percent and of those educated women who did marry, 20 percent did not have children. Were civilized girls to honor their difference and allow for its complete unfolding under the guidance of an education in which the development of the body was paramount, Clarke insisted, they would be uniquely poised to experience and facilitate the creation of a more advanced womanliness and, with it, an ever-improving society. “[I]f it were possible to marry the Oriental care of woman’s organization to the Western liberty and culture of her brain,” he mused, “there would be a new birth and loftier type of womanly grace and force.”

That the epoch of sexual development for the civilized girl (in contrast to both her civilized brothers and her uncivilized female counterparts) represented a period of “new birth,” honed out of physical and psychological stress and productive of individual and racial regeneration, was echoed in numerous medical texts of the period. Thus declared the authors of _The Practical Home Physician_, who assumed the racial and class markers of the civilized girl and boy they sought to compare:

The girl therefore demands and must receive other treatment than her brother; for him, sexual development is a more gradual and less integral process; on which does not materially change the bent of his inclinations, the direction of his pursuits, nor his physical habits, which intrudes itself upon his attention by no imperious calls; change, indeed, of which he is often long unconscious. For her, it is an introduction into a new world . . . it is the transformation of the caterpillar into the butterfly. For her there is no possibility of ignoring the change at hand, body, mind and soul unite in calling her attention to the duty of the hour; the strange, uneasy, perhaps painful bodily sensations, the mental languor and indisposition for accustomed pursuits, the indefinable longings and emotions, indicate as plainly to others also the dawn of the new existence.

For all of the arduousness and wonder of the girl’s transformation, though, these physicians, like most of the antebellum health reformers before them, also established clear parameters for the “new world” she was about to enter. “[T]he chief aim of the girl is to become a woman,” they succinctly declared, asserting that
the development of the girl, however complex and fully realized it might be, was complete with the achievement of sexual difference.63

No image more ubiquitously encapsulated the limits and possibilities of civilized girlhood entertained by Clarke and his fellow late-nineteenth-century physicians than that of the “budding girl.” As expressed in the nomenclature of the “kindergarten,” the more generic image of the child as seed, with the environment as garden and the adult as gardener, had been represented in multiple discourses of child health, education, and welfare since the early nineteenth century.64 Taken together, these two images performed a certain amount of similar cultural work. They both conveyed a new interpretation of development that recognized childhood and youth as distinct stages of life with their own qualities and needs—just as the seed and the bud were not miniature trees, plants, or flowers, so neither was the child a miniature adult. They also both communicated the dictates of the organic paradigm of development. As with the seed and the bud, all children’s growth was the product of innate biological imperatives, which emerged according to the precepts of a uniform pattern and moved the individual toward a preordained state of full maturity. The child’s education was to follow, guide, and assist these imperatives but was not to thwart and did not determine them.

That the girl approaching puberty required an additional natural metaphor to give meaning to her maturation, however, suggested that she was somehow overdetermined by this developmental paradigm.65 Indeed, late-nineteenth-century medical discourse held up the pubertal girl as the exemplar of organic development, as well as the primary signifier of the terms of its paradox. Thus, the teenage girl’s body, with its dramatic and all-encompassing physical changes, constituted as visible and easily decipherable sign as any of nature’s plan for the growing child. Concomitantly, it also served as the primary locus of anxiety over the need for the right kind of intervention required to ensure the proper procurement of that plan. In contrast, beyond establishing a persistent trajectory of growth for the boy, nature revealed few definite plans for his development. Moreover, per Herbert Spencer, while adult monitoring of the boy’s education was certainly important in guiding him along in his course, so too always was his own self-directed initiative, discovery, and experimentation. In this vein, John Harvey Kellogg offered an effusive rendition of the budding girl metaphor. “Real girls are like the opening buds of beautiful flowers,” he wrote in his popular medical guidebook, Plain Facts for Old and Young (1888). “The beauty and fragrance of the full-blossomed rose scarcely exceeds the delicate loveliness of the
swelling bud which shows between the section of its bursting calyx the crimson petals tightly folded beneath. So the true girl possesses in her sphere as high a degree of attractive beauty as she can hope to attain in after years, though of a different character.”

In addition to his rendering of the pubescent girl as an aesthetic and erotic object (a tendency in which he was not alone), Kellogg asked that the girl be recognized as differing qualitatively from her mother and that the “sphere” of her youth be protected and tended to with a spirit dedicated to the fullest emergence of her being. At the same time, he insisted that the “real” girl’s development was a matter not of dynamic adaptation and progressive movement toward unknown potential, but of mere unfolding, revealing, and realizing the female destiny that was already, always, and exclusively the essence of her nature.

In many ways, then, the “budding girl” constructed by Clarke and others did not closely resemble the figure of the “youth” that had come before or the “adolescent” that would follow, figures that at least in part embraced the possibility for relaxed expectations, expanded opportunities, and assertions of independence during this developmental stage. Hereby formulated as a part of a tradition that accentuated the significance of biological sexual difference, the teenage girl would thus continue to require explanations all her own in the scientific literature on child development to follow, with such explanations often serving as justifications for constraints on her opportunities and behavior. In other respects, though, the “budding girl” anticipated, and even enabled, the modern construct of adolescence in quite significant ways. The conception of adolescence as a critical life stage; the grounding of adolescent development in bodily changes occurring at puberty; the links emphasized between physical, mental, and emotional development; and the connection between adolescent development, individual adult well being, and the advancement of society and the race were all central components of G. Stanley Hall’s theory of adolescence. These components received their most elaborate articulation in the late nineteenth century in discussions about the pubertal girl. Indeed, one of Hall’s tasks would be to reconcile what he would call a “feminized” stage of development with the claims of the boy to the dramatic transformation and consequential “new existence” that he depicted as so vital to individual development and the advancement of modern civilization.

Before he did so, however, several advocates of coeducation contended that girls and boys continued to be “very nearly alike” throughout their teenage years, with girls capable of far more physically and mentally than Spencer or Clarke allowed and, as importantly, with boys
resembling their sisters in some of their physiological functions, their temperamental characteristics, and their requirements for education.

“THE QUESTION OF REST”: THE RESPONSE TO CLARKE

Immediately following the publication of *Sex in Education* numerous women’s rights advocates, educators, and medical experts issued pointed critiques challenging Clarke on practical, methodological, and theoretical grounds. Some critics, most notably those public school leaders whose responsibility it was to implement theories such as Clarke’s, dismissed his prescribed educational regimen for girls as utterly unworkable in the face of the realities of school life. Many also charged him with doing bad science, condemning him for relying on scanty, exaggerated, and even faulty evidence in the presentation of his clinical case studies, all in the interest of supporting his own prejudices about the limits of woman’s sphere.

At the forefront of these latter critics was Mary Putnam Jacobi, who along with Elizabeth Blackwell, was one of the foremost women pioneers in the medical profession and was, during the late nineteenth century, the most prominent female physician in the United States. Born in London in 1842, the oldest child of the prominent publisher George Palmer Putnam, Mary Putnam was amply schooled in the prescriptions for Victorian femininity that Clarke sought to defend, while also being exposed to alternatives beyond them. Her parents ascribed to the traditional division of labor dictated by the ideology of separate spheres, with her father providing economic support for the family and her mother presiding over the domestic realm. Her devout Baptist paternal grandmother, who helped to raise the nine Putnam children, taught and exemplified the virtues of female piety, nurturance, and self-sacrifice, the core values of nineteenth-century womanhood. Putnam’s interactions with her father’s world of publishing, however, also offered her a more cosmopolitan worldview, introducing her to many of the most renowned and popular literary figures of the day, including several women writers, and prompting her engagement with such vital social and political problems as slavery and women’s rights. As an intellectually precocious teenager with literary ambitions, Putnam attended the public, progressive Twelfth Street School for girls in New York City and set her sights on work outside the home. Graduating in 1859, she embarked on a teaching career and continued writing nonfiction essays and short stories, the first of which was published in the *Atlantic Monthly* when she was 17 years old.
During her teenage years, Putnam also struggled to make sense of and imbibe the beliefs and values of her grandmother’s evangelical religion and expressed hope that she would one day be saved. She had her first conversion experience just before her sixteenth birthday, following her father’s brief turn to evangelical revivalism as an emotional ballast against the financial difficulties he faced resulting from the Panic of 1857. Putnam’s religious devotion was, however, short-lived, as well. Additional family tragedies, the untimely death of the minister who brought her and other family members into the church, and, most notably, the beginnings of her scientific training, taken up first with private tutors and then through classes at the New York College of Pharmacy, led her during the early 1860s to question and reject many of the religious doctrines she had only begun to embrace. She challenged Calvinist beliefs on many grounds. She was particularly critical of the church’s teachings about the inferiority of women and the institution’s greater concern with salvation in the next world instead of the improvement of this one. It was, she ventured, the methods and insights of positive science that would reveal more accurate truths about woman’s nature and proffer viable solutions to social problems, including woman’s subordination to man.70

Putnam continued to formulate connections between science and women’s rights during the years of her medical training, first at the Female Medical College of Pennsylvania and then at the École de Médecine in Paris. In both the United States and France, women seeking medical education faced formidable obstacles from within the medical establishment and suspicion and hostility from the culture at large. Although Putnam benefited from the efforts of liberal educational reformers in both countries endeavoring to counter this trend, her own considerable struggles to obtain her degrees spurred her to a lifelong commitment to winning women equal access to medical education and improving their status in the medical profession. In addition, the research Putnam conducted for her theses at both institutions, on the function of the human spleen and the relationship between cellular degeneration and cellular nutrition, laid some of the groundwork for her research into the physiological problems related to female health and development that would occupy her later in her career. Putnam’s efforts as a medical student to forge links between laboratory research and clinical practice placed her at the forefront of scientific medicine. As a student in France, Putnam’s exposure to and enthusiasm for philosophical positivism, which eschewed metaphysics to emphasize knowledge derived from empirically observable phenomena, as well as the principles of socialism, republi-
canism, and women’s rights, led her to believe that science could serve as a key tool for facilitating social change.71

The integration of scientism and political activism, especially on behalf of women’s rights, became the touchstone of Putnam’s subsequent life’s work. When she returned to New York in 1871, she entered into private practice, began teaching at the Woman’s Medical College of the New York Infirmary for Women and Children, continued to conduct laboratory studies and experimental research, and pursued opportunities to publish her findings as well as her views on many scientific and social issues. In 1873, she married the German-Jewish physician and socialist Abraham Jacobi, who directed his own commitments to science and social reform to forging the specialty of pediatrics and securing a public commitment to improving the health and welfare of children. In the 1890s, Mary Putnam Jacobi joined the ranks of the Gilded Age’s women’s reform network, bringing her scientific viewpoint and expertise to bear as a prominent voice in the campaign for suffrage in New York State and as a founding member of and leader in the Consumer’s League of New York City.72 Jacobi’s devotion to science earned the respect of both men in the medical field, who were increasingly wedded to a model of scientific medicine, and an educated public willing to accept scientific authority. However, Jacobi was frequently at odds with other female physicians, most notably her friend and fellow medical pioneer Elizabeth Blackwell. Both Blackwell and Jacobi strove to improve medical education for women and to enhance their opportunities and respect within the profession. Both also applied their scientific knowledge to challenge perceptions of women’s limited capabilities and to argue for their capacity to make vital contributions to social change. For Jacobi, though, Blackwell’s Christian perfectionist view of health and disease and her emphasis on female doctors’ distinctive and superior powers of morality and compassion threatened to compromise the achievement of women’s equality in the medical profession and the society at large. Thus, when the occasion arose shortly after her return from Paris to counter medical and evolutionary orthodoxy about female development, Jacobi reiterated many of Blackwell’s earlier conclusions; only hers were arrived at and buttressed by the language and methods of what she deemed to be a far more rigorous, and therefore far more politically efficacious, scientific paradigm.73

Jacobi directly responded to Clarke’s treatise as a contributor to the 1874 collection, The Education of American Girls, in which she exposed the conservative social agenda driving the anti-coeducation argument. “The singular avidity with which the press and the public have seized upon the theme discussed in Dr.
Clarke’s book . . . is a proof that this appeals to many interests besides those of scientific truth,” she wrote. “The public cares little about science, except in so far as its conclusions can be made to intervene in behalf of some moral, religious, or social controversy.” This was followed by her own effort to establish the “scientific truth” about woman’s nature: her prizewinning work entitled The Question of Rest for Women during Menstruation, which explained “the real succession of phenomena in the menstrual process” and its relation to “the other processes of the [bodily] economy.”

Given that most of Clarke’s critics were not physicians or research scientists, it is not surprising that some sought to shift the ground on which knowledge about woman was to be derived. “The question comes down then to the one point,” pondered coeducation advocate Eliza Duffey, “which know most about the capabilities and disabilities of the female sex, the doctors or the women themselves?” Even so, for Duffey and others, the protest against Clarke was most effectively waged by countering one set of scientific “truths” about woman’s nature and development with another. It was here that Jacobi’s response to Clarke was especially helpful because Jacobi married her “common sense” about women from her own experience with the authority of science, which the late-nineteenth-century “public” did, indeed, care about, and often for the reasons Jacobi suggested.

Like all of Clarke’s critics, Jacobi endeavored to remove the stigma attached to female puberty and to reformulate some of the qualities that were thought to constitute teenage girlhood, without, necessarily, rejecting all notions of essential sexual difference or the importance of white middle-class girls and women to the advancement of western civilization. At the same time, she and others also reinforced some of the attributes of the teenage years ventured in Clarke’s account of the epoch of sexual development in the girl, suggesting that such qualities of body and mind had to be attended to when explaining and guiding the boy’s development as well.

Jacobi led the way in undermining the argument that rigorous mental work axiomatically threatened healthy female development by providing alternative explanations of both female growth and ovulation and menstruation. In formulating these explanations, she relied on and offered different interpretations of the same physiological paradigms accepted by ovarian theorists. She also introduced new empirical evidence about women’s experiences with menstruation. This evidence was based on statistical analysis of 268 women’s responses to questions about such factors as their experiences with menstrual pain, the amount of exercise they engaged in, and their family and educational histories, as well as on measurements of the changes that took place in a group of six women through-
out their menstrual cycles in the excretion of urea, pulse rates and temperature, and degrees of arterial tension. From her examination of this collection of data, Jacobi concluded that girls and women did not normatively require mental and bodily rest during menstruation and that rather than marking the nadir of vital energy in the female, “the menstrual period represents the climax in the development of a surplus of nutritive force and material.”

Jacobi accounted for this by offering up a “theory of supplemental nutrition,” which challenged Spencer’s and Clarke’s accounts of the limitations that the growth spurt placed on female development. Accepting the notion of the body as a closed system with limited energies, she posited that the force required for the establishment of the reproductive system came not from “a spontaneous diminution in the functions of certain nerve centers” but, rather, from a reduction of force in the “motor apparatus.” This system, she granted, obviously grew greater in mass in the male but was not, as was so often assumed, consequently inferior in its “structural development” or “functional activity” in the female. “Any general inferiority in the entire mass of the central nervous organs in women, as compared with those of men, . . . principally relates to the organs of motility,” she asserted, “the anatomical conditions of sensibility and of thought remaining the same.” That established, she proposed that, because the girl’s muscles and bones finished growing sooner than the boy’s, the girl had a surplus of organic nourishment sent from all parts of the body to the reproductive organs at the onset of puberty. Contrary to Spencer’s “useless, and even untrue” generalization about women’s aborted development, then, rapid and arrested growth of “general development” was not the price the girl had to pay for her reproductive development. It was, instead, the natural added benefit that allowed her reproductive functions to become established and all without undue taxation on either her physical or mental powers. Furthermore, the girl’s experience with the first menstruations set the pattern for the duration of the woman’s reproductive life, with periodical reproductive demands continually compensated for by “a gradual deviation from muscular nutrition resulting in an accumulation in the blood vessels of nutritive fluid refused by the muscles.” It was, Jacobi declared, the girl’s, and later the woman’s, capacity to produce this reserve of nutritional material that constituted “the essential peculiarity of the female sex.”

With a view of nature as kind, wise, and fundamentally just, as opposed to antagonistic and strenuous, she asserted that structured into the rigors of female development was a unique provision that endowed girls and women with the capacity for health and vitality. While Clarke had also claimed to put his faith in nature’s intentions, Jacobi accused, he drastically misconstrued those intentions as limit-
ing, rather than enabling, the scope of the developing girl’s potential for physical and mental activity as she prepared to enjoy the opportunities and assume the responsibilities of adult life.

If Jacobi’s theory of supplemental nutrition attested to the greater degree of biological fitness of the female animal, her critique of ovarian theory sought to effect a theoretical separation of the animal from the human and the body from the mind. Although she did not dispute the trends in modern science that alleged continuities and relationships among these realms of life, she did protest the excessive attention on woman as the exemplar of somatic determinism. To that end, her account of female reproductive physiology severed the links between both ovulation and menstruation and sex and reproduction. She severely objected to unsubstantiated inferences about menstruation in the human female from the experience of heat in the lower animals. She also argued that while menstruation and ovulation had been shown to be “parallel facts,” their “causal dependence” was by no means proved in the scientific record. Her own review of that record identified very few autopsy cases that found ruptured ovarian follicles in women who died during menstruation and noted the many autopsy findings of ruptured follicles in the absence of menstruation and of menstruation with no ruptured follicles. Also supporting her contention were the “tolerably numerous cases” of conception occurring, not just before or after menstruation as ovarian theorists surmised but midway through the menstrual cycle. According to Jacobi, ovulation was, indeed, a “spontaneous” phenomenon, as ovarian theorists claimed but rather than occurring periodically and precipitating menstruation, the consecutive maturation and rupture of the vesicles containing the ova “strictly resemble[d] the successive growth of buds on a bough,” a purely random, and rather unremarkable, occurrence, tied only statistically to the menstrual flow.

After she dismissed the links between ovulation and menstruation, Jacobi proceeded to contest ovarian theory’s core assumption that the reproductive function in the female involved “a peculiar expenditure of nerve force, which was so much of dead loss to the individual life of the woman.” Such a claim, she argued, was based on a mistaken conflation of two, wholly distinct aspects of the female reproductive system, the sexual and the reproductive. Reproduction, she explained, was essentially a nutritive process that bore no fundamental connection to the sexual instinct. Unlike the male, for whom the expulsion of the reproductive cell coincided with sexual pleasure and the experience of intercourse, in the female, the ova dehisced independent of coitus, with the sexual instinct remaining unawakened. For Jacobi, this was the significance of the spontaneous occurrence of ovulation propounded by ovarian theory. It was also an-
other factor that determined the essential difference between man and woman. “The theory of spontaneous ovulation,” she asserted, “means precisely that in the female the essential part of reproduction can be effected without any sexual act. The superior contribution to 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.” As nutritive phenomena, Jacobi concluded, ovulation and menstruation had no more effect on mental activity or the nervous system than any of the other bodily nutritive functions, such as respiration, circulation, or digestion. Rather than constituting “an extraordinary exception among physiological phenomena” that dramatically interrupted ordinary physiological life, the periodicity of the menstrual flow, like all other rhythmic bodily functions, marked “the simple climax of a series of consecutive processes perfectly continuous with one another.” Jacobi allowed that insofar as the reproductive system required additional vital energy for its proper functioning, the other difference in the female body worth remarking—its capacity to replenish quietly and constantly a supplemental nutritional reserve—guaranteed that the need would be met without affecting the woman’s intellectual capacity or her general nervous stability.

The first menstruations were conceived by Jacobi as instigating no great crisis in the life of the girl just as each adult menstruation did not upset the equilibrium of the nervous system. To make such a case, she illustrated the physiological continuity between childhood and maturity in the female. Again challenging a basic presumption of ovarian theory, she explained that Graafian vesicles and ova indistinguishable from those of the adult female composed the ovaries of girl children after age 2. During childhood, the vesicles gradually and successively developed, eventually atrophying without rupture. In the three or four years preceding the onset of menstruation, the ovaries increased in size gradually, a process that never exceeded the girl’s capacity to meet the added nutritive requirements. The establishment of puberty was not, then, characterized by sudden or rapid growth of the reproductive organs or by the assumption of entirely new functions but merely by the greater vascularization of the Graafian vesicle, accompanied by “the secretion of fluid into its cavity, leading to the rupture of its walls and the escape of the ovum.” Although the commencement of the menstrual flow also marked the onset of puberty, it was the changes in the ovaries, conceived as such, that defined female pubertal physiology for Jacobi and that indeed provided the physiological basis for a period of adolescence. She explained: “The period of [the uterus’s] prominent activity does not come until after the action of the ovaries has been completely established; that is, the period
of maternity is, or should be, consecutive to the period of adolescence, and the
work of gestation only entered upon when the work of ovulation has long been
thoroughly accomplished.” As Clarke had asserted, Jacobi also maintained that
the pubertal girl was not yet in full possession of her reproductive powers. For
her, though, the first menstruations, rather than occasioning immediate danger,
constituted a more or less benign rehearsal, in rudimentary form, of a crucial
nutritive function that would be carried out at a future epoch in the life of the
woman. That nature determined female development so was more of a “ca-
price” than a threat and warranted far less anxiety than was currently being
propelled in the direction of the growing girl. “[T]o impose on the girl the
precautions necessary to the mother,” Jacobi admonished, “is one way to en-
feeble and prematurely age her.”85

Many of Clarke’s other critics joined Jacobi in depicting girls as “good ani-
mals,” albeit decidedly immature ones, insisting that they possessed the natural
strength, essential vitality, and native intelligence during childhood and youth
that provided an optimum foundation for future physical and mental health. Yes,
they conceded, nature made some undue demands on the girl at puberty, but it
also overcompensated for the added difficulties by endowing females with a
“surplus vitality” present from birth. This extra energy bestowed on girl infants a
greater capacity to thrive, as well as conferred on pubertal girls the rapid growth
spurt, which was designed as such to meet the particular requirements of the
female reproductive system.86 Still, this optimistic characterization of the girl’s
nature did not explain why so many civilized girls and women suffered from ill
health. Indeed, most women Jacobi questioned reported suffering from some
sort of “pain, discomfort, or weakness” during their menstrual periods.87 To
explain this, many of Clarke’s critics returned to the group of dangers subsumed
under “precocity,” which they defined, not as Spencer did, as an essentially
limiting attribute of the girl’s development, but as the antebellum health re-
formers had, as artificial influences acting on the girl that belied and frustrated
nature’s true intentions for her development. Whereas Clarke was concerned
that the pursuit of education during the teenage years dangerously postponed
the girl’s attention to her reproductive function until it was “too late,” then, his
opponents were preoccupied with the developmental problems that ensued
when the ways of childhood were “too early” relinquished for adult manners and
mores. Thus, girls were vulnerable to weakness and disease because they succ-
cumbed to the trappings of adult femininity that abided in civilized society: a
sophisticated diet of rich or spicy foods, fashionable dress, unwholesome novel
reading, frequent socializing, no outdoor play and exercise, and, worst of all,
sexual passion. It was the emotional excitement induced by such rushed female development that produced the ominous consequences that Clarke associated primarily with rigorous education. Sickly constitutions and menstrual problems resulted, to be sure, as did vapid and sensuous personalities, nervous temperaments, and dull intellects. “Critical’ fudge!” exclaimed Duffey in decrying Clarke’s conception of the girl’s teenage years. “Let nature have fair play, and she is perfectly capable of managing the child without repressing physical manifestations of activity or checking mental ones . . . The headache, the dyspepsia, the nervous paroxysms, are so many protests of nature against the compressment and confinement—in direct words, against the unnaturalness of her life.”

Management of the female child was not, of course, to be left entirely to the play of nature, however “fair” this may have been. Indeed, the point of all of the responses to *Sex in Education* was to argue that civilized girls were capable and in need of a rigorous intellectual and moral education comparable to what their brothers received. This would both counter the pernicious environmental pressures that preyed on the female child in modern society and enable her “animal nature” to be trained toward what Anna Brackett called her “second and better nature.” “The very essence of civilization, of morality, and of religion, consists in the overruling and directing of the merely natural,” Brackett insisted. “By nature, man is not man at all. Only in so far as by force of spirit he overcomes, rules, and directs the nature in him can he lay claim to manhood.” Whatever she intended by it, Brackett’s use of the generic “man” here would have recalled for her readers Spencer’s and Clarke’s view that it was the civilized male who was most capable of exercising the rationality, self-control, and self-determination that were the driving forces behind individual, racial, and social evolution.

Other advocates of coeducation more directly countered such notions of male advantage. Like Jacobi, they deemed that woman’s “animal nature” was “inferior” to that of man, with the gap between her “barbarous” childhood and “civilized” adulthood therefore narrower and more quickly closed. Endowed with the strength, health, and intellectual capacity to support its wide-reaching influence, woman’s “second nature” was superiorly oriented toward the qualities of altruism, compassion, and service. Moreover, it was these attributes that would provide an important counterpoint to men’s destructive selfishness, competitiveness, and greed in the modern world and play a leading role in revitalizing the race at this stage of its evolution. Jacobi, too, conceded that moral differences between men and women were more marked than intellectual ones, although she hedged on whether these were either entirely innate or exclusive to woman’s nature. Even so, she advised, the failure to recognize and to cultivate
“feminine” morality in the education of the girl “would be an injury to society, that requires, not uniformity, but increasing complexity, by means of increasing variety of character among its members.”

In their outcry against precocity, then, Clarke’s opponents expressed their distaste for what they perceived to be the dominant feminine ideal in modern society—weak, superficial, vain, dependent—as well as registered their hopes for an advancing civilization in which women of the white middle class would have a larger role to play. The problem was not that the girl received too much education, Duffey exhorted, but that she received too little, and the wrong kind, in that it encouraged her toward the “follies and dissipations of fashionable society” from earliest childhood, turning her into “but a pitiful caricature of what she should be.” Clarke’s program for special education would only make things worse, she averred, because by placing exclusive emphasis on the development of the reproductive system, “woman will be woman no longer, but an exaggerated female, weak and wanting in all other functions and faculties, and abnormally developed in the peculiarly feminine parts of her organization.” Several of Clarke’s critics joined Duffey in deriding these “sexual monsters” for their inability to perform their roles as wives and mothers, deeming them physically, mentally, and morally unfit to transmit the attainments and values of civilization to the next generation. Others envisioned the identity of “woman” as encompassing the functions of the female, certainly, and the roles of wife and mother, most likely, but also the possibilities of the individual, the “citizen,” and the “human being.” It was, Julia Ward Howe insisted, no wonder that girls professed only to be concerned with fashion or that they became ill after leaving school. Unlike boys, who had “the healthful hope held out to them of being able to pursue their own objects,” girls and young women faced only “the dispiriting prospect of a secondary and derivative existence.” Jacoby weighed in here, too, with an equal measure of critique and sympathy: “A healthy objectivity is one of the greatest desiderata for modern women. To knock the nonsense out of them, to direct attention from self, to substitute a cosmic horizon for that of their own feelings, who does not know the importance of this for thousands of hysterical women? and equally the impossibility of attaining it?” For the more optimistic Mrs. Horace Mann, the degree of civilization was directly correlated to the number of unmarried women in a society. It was, she contended, those women who cultivated independent lives—developed and educated both into and beyond their “femaleness”—who would “bear the noble fruits of culture, benevolence, and devotion to human improvement” that were the well-springs for ongoing racial and social progress.
Clarke’s opponents hereby made the case for increased educational opportunity for girls during their teenage years and for a wider range of possibilities for female identity in adulthood. Their emphasis on “keeping girls girls,” however, also established its own limits on the maturing girl’s capacities for autonomous action and self-determination. After all, Duffey’s question about who was to be the authority on female potential supposed that adult women had as much to say about the matter as male doctors but did not consider what the developing girl might know, imagine, or seek to express about her current or future self. Insofar as white middle-class girls were engaging in the sorts of “precocious” behaviors that Clarke’s critics found so objectionable, they were depicted as surrendering to dangerous external influences that were beyond their control, at worst, or, at best, as misguidedly pursuing their natural inclination for activity and independence. American girls “will rule themselves,” Brackett reluctantly conceded and proudly proclaimed, “and it therefore behooves us to see that they are so educated that they shall do so wisely.” Duffey, too, recognized and applauded the girl’s penchant and capacity for autonomy, certainly a departure from Spencer’s and Clarke’s characterization of her dependence and passivity, while also cautioning that this tendency had to be channeled through the proper education of the body, mind, and will toward her “better nature,” the substance and limits of which were determined by the values and mores of adults of the white middle class. Given the prevalence of all of the “crying evils of our age,” she chastised, Clarke was remiss for not realizing that “there is an energy in girlhood that will not be repressed, that will always indulge in some sort of activity.” “A girl at this age never does anything by halves,” she continued. “It is the time for a life-choice with her, and what is chosen is chosen. She will throw all her energies into flirtation and turn out a coquette of the first water. Or, if she have not strength of character to do any of these wholesale things, she will fritter away her time in small nothings, and so fix herself in the habit of inactivity that when her years of enforced rest are passed she cannot be aroused to effort of any sort.” Alternatively, Duffey anticipated, the girl who chose to expend her energy in exercising her superior capacity for love and compassion marshaled a power that was “sufficient almost for the regeneration of the world.” Whatever route the girl took (and it was patently clear where Duffey’s preference lay), the more subtle and novel contribution here was that for girls, too, the transition from childhood to adulthood was to be marked by a tension between dependence and independence. The gradual development and sustained education that were to take place during this stage of life were at once to foster the autonomy and self-directed energy in the female child that coeducation supporters viewed as her
birthright and as vital to the advancement of civilization and to provide for adult protection and supervision so that the girl would be sure to grow up to become "what she should be."

As their identification of this tension suggests, coeducation advocates’ characterization of the teenage girl as strong, active, healthy, intellectually capable, and in possession of a heightened moral capacity did not mean that she did not also face a unique set of physical, mental, or emotional challenges. For Clarke’s critics, though, such difficulties were as much attributable to her age as to her sex. With this claim, they made the case that if, on balance, female puberty required less attention than it received, the male epoch of development warranted far more. It was, again, Jacobi who provided the initial medical justification for this assertion. Returning to the ancient one-sex model of the body, she boldly asserted that the organs of reproduction were anatomically and physiologically equivalent in the two sexes. “An excess of bulk in one direction,” she slyly noted, “is compensated by an inferiority in another, so that the sum total is the same.” Moreover, “the period of [the development of the reproductive organs], the influence of such development on the entire nutrition of the body, the irregularities of nutritive or of cerebro-spinal action that may be caused by irregularities in such development” were also entirely analogous. Whereas girls required a “trifling” amount of nutrition for the “extra development” of the egg and more nutrition for the production of the menstrual blood (which did not immediately cost them anything), boys spent more nutrition on the new and more abundant development of sperm and less on the production of semen. Such comparisons were useful to Jacobi both to counter declarations about the girl’s physical and mental weakness and to draw attention to the age-specific potential dangers faced by girls and boys at puberty. Thus, despite her highly sanguine depiction of female development, she nonetheless also warned that during adolescence, both boys and girls were as likely to suffer physically and psychically from the injurious effects of competitive schooling, lack of sufficient exercise, and ignorance of basic physical care. They were also both likely to experience a degree of “morbid emotional excitement” that was natural to their age, simply because all young people had yet to cultivate the kind of sophisticated mental power and moral judgment to always temper their emotions properly.

Jacobi’s recommendation for handling such psychological challenges and for cultivating maximum physical health for both girls and boys was to secure the predominance of the intellect and the will over the emotions and the instincts. This was to be achieved by providing all adolescents with “a larger, wider, slower,
and more complete intellectual education” than was currently the norm for either sex, by accompanying it with a systematic program of physical exercise, and by making individual adjustments to meet particular mental, moral, and physical needs. Ideally, though, girls’ education during the early teenage years was to be separate from boys’, even as it was to be intellectually identical. This was counter to the view of some of Clarke’s other critics, who saw integrated education as morally uplifting for both sexes and single-sex schools as pernicious “breeding grounds” for the “secret vice.” In Jacobi’s determination, the most compelling reason for separate education was to prolong the “unconsciousness of sex” during those years when the physical, mental, and moral organizations of boys and girls were still imperfectly developed and unable to manage effectively the emotional excitement aroused by the close contact between them that co-education required. To claim that woman was “sexually inferior” to man was thus not necessarily to discount the importance of safeguards that would protect female purity, especially during teenage girlhood. Still, Jacobi was also careful to add that such precautionary measures ought to abide only during the early teenage years and in no way justified denying girls age 18 or over access to identical and integrated higher educational opportunities.

Fellow physician Elizabeth Blackwell drew similar conclusions to Jacobi’s about the development of girls and boys during the teenage years, although these were derived from her markedly different Christian-physiological perspective. Blackwell’s *The Laws of Life* pioneered in laying out general principles of child development for mothers and teachers in the antebellum period, as well as in claiming for the girl the same moral, intellectual, and physical benefits of gradual, steady development deemed to be normative for the boy. In her 1884 work, *The Human Element in Sex*, she was as interested in revealing the ways in which the boy’s pubertal development seemed to mimic that of the much more frequently commented on pubertal girl. Like Jacobi, she declared that the organs that produced the two essential secretions for reproduction—the ova and the sperm—were “strictly analogous in the two sexes.” Departing from earlier medical and religious admonitions against all forms of sexual incontinence in young men, Blackwell compared the nocturnal emissions that occurred spontaneously, and “even with a certain degree of periodicity,” in the teenage boy with the “natural healthy” functions of ovulation and menstruation in the girl. For Blackwell, in both cases, the body beneficently discharged the unused sexual secretions with the divine purpose of realizing the “perfection of human growth”: “Thus in the female the constant formation of ova is subordinated to the needs of individual freedom, and to the power of mental self-government, by the function
of menstruation . . . In the male the slower secretion of sperm is adapted to the same individual freedom and power of self-control by the natural function of sperm-emission.” The benevolent intentions of the “Creative Power” notwithstanding, however, the “sudden appearance” of the functions of menstruation and sperm emission was sure to occasion “fright” in the teenage girl and boy alike, and these functions certainly had the tendency to become diseased when “unduly stimulated” by the brain and nervous system. Thus were parents to be ever vigilant during this critical stage of development: “It is of vital importance to the parent to know that such action [occurring at puberty] is as natural and healthy in the growing lad as in the growing girl, but that in both it is a time requiring guidance, both moral and physical.”104 As in her earlier work, Blackwell’s late-nineteenth-century text recognized physical differences between the sexes, celebrated women’s distinctive moral and spiritual power, and advocated for the special contributions women could make to private and public life. Here, though, it was the girl who stood out as the normative model for pubertal development; knowing what happened to her body and mind provided a way to understand, to talk about, and to respond to the boy’s epoch of development as well.

Clarke’s other critics also took this dual tack. On the one hand, they were determined to establish that the epoch of sexual development was not so debilitating that it impeded the girl from taking advantage of educational opportunities or exercising her capacity for “individual freedom.” On the other hand, they were willing to allow that important biological and psychological changes did occur during this transitional developmental stage but only insofar as these were attributable to boys as well as girls. Duffey asserted that the “outer characteristics” of impending maturity were “as striking” in the boy as in the girl and identified these as the change of voice, the appearance of facial hair, and the seminal secretion, “the normal and proper production and retention” of which determined the young man’s future health just as surely as the regular establishment of the menstrual cycle determined the girl’s future health. These corresponding changes in the boy’s body called for a similar response to the changes visited on the girl, which, Duffey regretted, was not currently forthcoming. “Just as great a care, just as watchful precautions, are required in the one sex as in the other,” she avowed, “though to the shame of humanity be it spoken, the needs of the young man are overlooked, while his sister attracts all the attention.”105 Boys suffered equally, too, from precocious behaviors and especially from an educational system that was in dire need of reform for the benefit of all children. The debate over the education of the girl hereby gave voice to calls for schools that
would attend to the physical, mental, moral, and social development of children on the basis of their discrete needs—children of “quick,” “average,” and “dull” intellects and of weak and strong constitutions receiving opportunities that matched their distinctive deficits and capabilities. “When development begins,” explained Caroline Dall, “special treatment is required; not according to the sex so much as according to the individual . . . That school or family is an absolute failure which does not allow a margin large enough and loose enough for all possible contingencies, as regards boys or girls.”

Duffy contended that more attention to providing the boy with a balanced education that attended to more than the cultivation of his intellect or to his prospects for individual success would restore to him his “obligations to posterity” and his “responsibilities of the coming race.” Countering Clarke’s portrayal of the cold, “tottling brother” with the example of her own son’s clasp and caressing of his sister’s doll, she posited the existence of a “divine instinct of fatherhood,” which, she lamented, the current system of education would continue to destroy until there were but “few really worthy, good and loving fathers in the land.”

At the same time that some of Clarke’s critics drew attention to those biological and psychological imperatives of age that cut across gender lines, others took note of the changes that were occurring in working-class girls’ lives in this same period and ventured to universalize those same imperatives across lines of class and ethnicity as well. With the growth of cities and the expansion of industrial capitalism, working-class girls, many of them immigrants, were taking jobs in factories, department stores, and offices that afforded them new opportunities for social independence and sexual autonomy and subjected them to various forms of economic and sexual exploitation. This same dynamic abided in the free time of these girls as well, as they sought out the many new forms of commercialized leisure that strove to appeal to a youthful, heterosocial audience. Many of the same advocates of coeducation who condemned precocity as the primary culprit in the poor health and nervousness of white middle-class girls also charged the life of “common toiling” as destroying the essential vitality of working-class and immigrant girls and of robbing them of a gradual development in which they, too, were to be sheltered from the temptations and free from the responsibilities of the adult world. Far more taxing on the girl’s physical energies than even the most rigorous schoolwork, rebuked Marie Elmore, were the long hours and poor conditions faced by female factory operatives, clerks, and seamstresses. And yet, she rhetorically demanded, “Has Dr. Clarke written a book on ‘Sex in Manufacturing Establishments’?”

Following the initial brouhaha over coeducation, working-class and immi-
grant girls came under even closer scrutiny by moral reformers, who feared the challenges the changes in their lives posed to the Victorian gender and sexual order. More wont to see such girls as victims of class, gender, and age exploitation, rather than as willfully rebellious, reformers involved in the late-nineteenth-century campaigns to raise the age of consent, eliminate prostitution, and regulate leisure affirmed that the teenage years were vulnerable ones for all girls, whose imperiled bodies required the special protection of adults. Indeed, one of the arguments of those advocating to raise the age of consent (a campaign in which the voices of physicians also played an important role) was that puberty not be relegated, as some would have had it, as the “natural position” at which the girl could legally agree “to this form of degradation.” Working-class girls just growing up, declared Emily Blackwell (Elizabeth’s sister) in her testimony on the issue, were the most helpless class in society and deserved the same opportunity as their more privileged sisters to develop physically, mentally, and morally before being held responsible for making decisions about sexual activity. Not everyone agreed. As one opponent of age-of-consent legislation opined in an article entitled “The Age of Consent from a Physio-Psychological Standpoint,” for girls of the working class and girls of color, puberty conferred maturity. To fail to recognize this was potentially to subject an innocent boy to “the hands of a lecherous, sensual Negro woman, who for the sake of blackmail or revenge would not hesitate to bring criminal action even though she had been a prostitute since her eleventh year!” For this writer, as well as for the opponents and, in some ways the proponents of coeducation, insofar as an epoch of development bestowed on the female child protections for her growing body, allowances for her immature mind, and opportunities to claim some capacity for independence in the pursuit of an intellectual education, these privileges were to be enjoyed by civilized girls alone.

The rhetorical onslaught against coeducation had no effect on the predominant trend in gender practices in education that had been unfolding since the early nineteenth century. From 1870 to 1900, public secondary education remained “overwhelmingly coeducational,” with teenage girls accounting for 57 percent of the students and 65 percent of the graduates of high schools in 1890. In addition, young women continued to take advantage of expanding opportunities for higher education. By 1900, 36 percent of all students enrolled in colleges and universities were young women. Even so, as historian Margaret A. Lowe demonstrates, concerns about the developing female body continued to loom large throughout the period, particularly on college campuses. In response
to the fears incited by Clarke and in keeping with the recommendations offered by his critics, college administrators at single-sex and coeducational schools established health education programs and instituted practices that encouraged and, in many cases, required girls to take care of themselves by eating well, exercising, getting sufficient rest, and observing proper hygiene. They measured how their “student bodies” were doing by conducting mandatory physical and medical exams on girls at specific points during their college careers. Moreover, they prominently reported on their success at maintaining and even improving female students’ health, allegedly at no compromise to their femininity, in annual reports, promotional materials, and public speeches. In personal letters and student publications, girls also revealed a heightened attention to their physical health. While some registered anxiety that they may indeed be putting their health at risk by studying too hard, far more expressed confidence, pride, and even pleasure in their bodily well being and played active roles in defining the meaning of good health and sustaining it in conjunction with their educational endeavors and goals. Meanwhile, following Jacobi’s lead, numerous scientific studies were conducted by individual physicians and organizations, such as the newly founded Association of Collegiate Alumnae, that corroborated the reassurance about education and female health being offered by college officials and their students.114

Along with these influences on the girl’s educational career, the coeducation debate also left an important legacy to the intellectual tradition of child development studies. Taken together, the accounts of the detractors and defenders of coeducation constituted the most comprehensive and multifaceted examinations and explanations of female adolescent development before the publication of Hall’s text. The points of contention and convergence over the nature of female puberty; the temperament of the teenage girl; the relationship of sexual difference to physical, mental, moral, and emotional development; and the relative influences of nature and nurture in the manifestation of femininity across the life cycle all worked to construct the adolescent girl as a meaningful object worthy of future scientific investigation. In addition, from the collection of portrayals of female development that composed the coeducation debate, the girl emerged as a prominent model of the modern adolescent, helping to establish those links between puberty and adolescence, biology and psychology, and individual growth and social progress that the developmental tradition’s concerns with the growing teenage child would both reinforce and question throughout the twentieth century.