CHAPTER 8

Purdah, National Degeneration, and Pelvic Politics: Women's Physical Exercise in Colonial India, c. 1900–1947[1]

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Abstract

Against the background of pervasive anxieties of national degeneration, physical exercise for Indian girls and women became an issue taken seriously in the British colony from the early decades of the twentieth century on. This was true especially for girls and women belonging to the middle- and upper-caste and class sections of Indian society. This chapter examines the discourses that portrayed physical exercise as a scientific remedy to the ills allegedly brought about by purdah, or female seclusion, and to maternal mortality in particular. In doing so, it shows that the globalizing medico-scientific fixation with the breadth and flexibility of the female pelvis and its role in child delivery influenced the debates on women's physical education and contributed to its gendering.

Keywords: purdah; physical exercise; women's health; maternal mortality; colonial India; colonial medicine

Introduction

In the past few decades, scholars, especially historians of women's history, have shown that the size, shape, and position of the female pelvis, like breasts and labia, captured the imagination of several scientific studies and were attributed a prominent role in procreation in the late nineteenth and early twentieth centuries. The medico-scientific and anthropological fixation with the breadth of the female pelvis and its role in child delivery influenced discourses of reproduction at the global level. Like in the case of head shape in craniometry, the differences existing in pelvises

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were deemed to be marks of racial identity and hierarchies. Whereas initially it was believed by anthropologists that a wide pelvis was a characteristic of primitive races linked to their hypersexuality, by the 1820s the combination of craniometry and pelvimetry gave currency to the view that pelvises had grown larger in white women to accommodate the superior head size and intelligence of more civilized races during delivery. Even though it never reached the symbolic value of the cranium, the pelvis remained crucial for decades in placing different "races" on an evolutionary ladder. Offering conflicting and equivocal explanations on what exactly made a pelvis racially advanced and being associated with moral values that showed how gender was firmly rooted in sex, the story of the female pelvis remained a matter of debate well into the twentieth century.[2] Perhaps it was precisely this ambiguity that ensured its long-lasting popularity in both anthropological and medico-scientific discourse as well as its flexible adoption and often unruly appropriation.

While influential studies have thus explained how pelvimetry historically influenced the construction of racial difference and sexual dimorphism, what is decidedly less known is that ideas about the pelvis affected notions and practices of physical exercise, often upholding and reinforcing deep-seated beliefs of women's innate physical weakness and fragility. This chapter attempts to piece together the ideas that linked the debate on the female pelvis and childbirth with the development of schemes of physical exercise for girls and women in colonial India and beyond. Centering on historical actors from different fields, such as medical doctors and physical culture experts, the chapter reveals the haphazard and contingent nature of processes of knowledge production, appropriation and circulation.

A rich scholarship on South Asia has investigated the emergence, especially from the fin de siècle onwards, of the male physical body as a crucial link between the strength and vitality of the national community and the health and vigor of its individual members.[3] New ideas of "muscular" nationalism that emphasized the

[2] Among others see Rebecca Hodes, "The 'Hottentot Apron': Genital Aberration in The History of Sexual Science" in V. Fuechtner, D. E. Haynes, R. M. Jones (eds.), *A Global History of Sexual Science, 1880–1960* (Oakland, CA: University of California Press, 2018), 118–38; John Hoberman, "The Primitive Pelvis: The Role of Racial Folklore in Obstetrics and Gynecology During the Twentieth Century", in C. E. Forth and I. Crozier (eds.), *Body Parts: Critical Explorations in Corporeality*, (Lanham, MD: Lexington Books, 2005): 85–104; Sally Markowitz, "Pelvic Politics: Sexual Dimorphism and Racial Difference", *Signs* 26, no. 2 (2001): 389–414; Laura Briggs, "The Race of Hysteria: 'Overcivilization' and the 'Savage' Woman in Late Nineteenth-Century Obstetrics and Gynecology", *American Quarterly* 52, no. 2 (2000): 246–73; Londa Schiebinger, *Nature's Body. Gender in the Making of Modern Science* (New Brunswick, NJ: Rutgers University Press, 2004 [1993]), 156–8; Ornella Moscucci, *The Science of Woman: Gynaecology and Gender in England, 1800–1929* (New York: CUP 1990), 38–39; Londa Schiebinger, "Skeletons in the Closet: The First Illustrations of the Female Skeleton in Eighteenth-Century Anatomy", *Representations*, no. 14 (1986): 42–82.

[3] For a concise analysis see Carey Watt, "Physical Culture and the Body in Colonial India, c. 1850–1947", in H. Fischer-Tiné and M. Framke (eds.), *Routledge Handbook of the History of Colonialism*

entwinement of physical culture and political activism became powerful tools in the hands of Indians with which they could challenge claims to a "superior" "imperial masculinity", and "perform" a nationalism based on a premise of hegemonic masculinity.[4] While this has by now become a trope of South Asian studies, the emphasis that was placed on the female body as a polysemic site to be rendered fit, strong, modern and (Hindu) national through physical exercise to ensure the healthy reproduction of the nation is yet to be fully explored. As far as the female body is concerned, in fact, more attention has been paid to the discursive construction of it as the symbolic bearer of identity and honor, personally and collectively.[5] However, as argued by Antoinette Burton, like symbolic ones, material bodies are neither self-evident nor static: they do not exist *a priori* but are produced and consolidated by their collision with historically specific events, formations and experiences.[6]

As I have shown elsewhere, Indian female fit bodies were culturally constructed, historically contingent, and based on often unstable and ambiguous gender differentiation norms. Advocated by a cacophony of historical actors and institutions, either Western or Indian, to teach Indian girls and women ways of behaving, moving and taking care of their bodies, physical fitness schemes gained increasing importance from the turn of the twentieth century in light of global and colonial specific factors. Female physical exercise targeted especially the "right sort of women", namely middle-class, upper-caste Hindu girls and women, who were

in South Asia, (Abingdon: Routledge, 2022), 345–58. This was a global phenomenon: with the increasing popularity of sports and fitness, fit bodies became a strong component of nationalism. Among many others see Sayuri Guthrie-Shimizu, *Transpacific Field of Dreams: How Baseball Linked the United States and Japan in Peace and War* (Chapel Hill: UNC Press, 2012); Wilson C. Jacob, *Working Out Egypt: Effendi Masculinity and Subject Formation in Colonial Modernity, 1870–1940* (Durham and London: Duke University Press, 2011); Barbara J. Keys, *Globalizing Sport* (Cambridge, MA: Harvard University Press, 2006).

[4] See for example Aishwarya Ramachandran and Conor Heffernan, "A Distinctly Indian Body? K.V. Iyer and Physical Culture in 1930s India", *International Journal of the History of Sports 36*, n. 12 (2019): 1053–1075; Sikata Banerjee, *Make Me a Man!: Masculinity, Hinduism, and Nationalism in India* (Albany: State University of New York Press, 2005); Joseph Alter, "Indian Clubs and Colonialism: Hindu Masculinity and Muscular Christianity", *Comparative Studies in Society and History* 46 (1 July 2004): 497–534; Paul Dimeo, "Colonial Bodies, Colonial Sport: 'Martial' Punjabis, 'Effeminate' Bengalis and the Development of Indian Football", *International Journal of the History of Sport* 19, no. 1 (2002): 72–90; Mrinalini Sinha, *Colonial Masculinity: The "Manly Englishman" and the "Effeminate" Bengali in the Late Nineteenth Century* (Manchester: Manchester University Press, 1995).

[5] For a classic analysis of these themes see Nira Yuval-Davis, *Gender and Nation*, London: Sage, 1997. See also Mrinalini Sinha, "Gender and Nation", in Bonnie G. Smith (ed.), *Women's History in Global Perspective*, Vol. 1 (Urbana and Chicago: Illinois University Press 2004, 229–274).

[6] Antoinette Burton, "The Body in/as World History" in D. Northrop (ed.), *A Companion to World History* (Oxford: Wiley–Blackwell, 2012), 272–284, here 276.

expected to embody the highest physical, moral and intellectual standards of the Indian "nation".[7]

In this context, ideologies of childbirth, fears of racial degeneracy, and population control urges opened a new arena of debate on the need for strong healthy female bodies—with physical exercise increasingly portrayed as a scientific remedy to the ills supposedly brought about by purdah (the custom of secluding and veiling women), in particular maternal and infantile mortality. This development was influenced by the emergence of professional medical platforms spearheaded by British women in India and centering almost exclusively on the care of Indian women. In what follows, I explore the link established between physical exercise, healthy reproduction and the pelvis both in colonial medical circles and among Indian physical culture experts in colonial India. The chapter intends to demonstrate that the focus on the female pelvis in terms of women's physicality problematized forms of binaries such as colonized/colonizer, civilized/uncivilized women and mobility/confinement while (re)iterating sexual physical difference and gender stratification.

Physical Exercise As a Remedy for the Ills of Purdah

Initiatives surrounding physical exercise for girls and women appeared at around the turn of the twentieth century. Concerned with keeping female bodies healthy in view of their chief role as mothers of the nation as well as with anxieties about their feminine attractiveness, respectability and graceful movement, physical education was part of the curricular activities of a few schools in British India.[8] Examples were the Kanya Mahavidyalya in Jalandhar[9] and the Central Hindu Girl's School in Benares,[10] respectively founded by the Arya Samaji Lal Devraj and by the

[7] Elena Valdameri, "Training Female Bodies for New India: Women's Physical Education between Global Trends and Local Politics in Colonial South Asia, c. 1900–1939", *International Journal of the History of Sport* 39, no. 11 (2022): 1240–1264.

[8] *Progress of Education in India 1892–97: Third Quinquennial Review* (London, 1898), 379 and *Progress of Education in India 1897–1902* (Calcutta: Office of the Superintendent of Government Printing in India, 1904), 423.

[9] See Madhu Kishwar, "Arya Samaj and Women's Education: Kanya Mahavidyalaya, Jalandhar," *Economic and Political Weekly* 21, no.17 (1986): 9–24. Also, J.E Llewellyn, *The Legacy of Women's Uplift in India: Contemporary Women Leaders in the Arya Samaj* (Delhi: Sage, 1998) 26–46. The Arya Samaj was a Hindu revivalist religious and social reform movement whose origin goes back to the last quarter of the nineteenth century. The Arya Samaj was particularly influential in North India among urban clerical castes until the 1940s, when it started dwindling. See Harald Fischer-Tiné, "Arya Samaj", in K. A. Jacobsen (ed.), *Brill's Encyclopedia of Hinduism*, Vol. V (Leiden: Brill, 2013), 389–396.

[10] See "Education of Indian Girls", in Annie Wood Besant, *The Birth of New India: A Collection of Writings and Speeches on Indian Affairs* (Adyar, Madras: Theosophical Publishing House 1917),

Theosophist Annie Besant. Like in the case of the male body, the nexus between individual female exercise and the health of the national body was clearly built on discourses such as the degeneration of the "stock", influenced by widespread social Darwinist and (para-) eugenic views.[11]

It was only from the 1910s and then more markedly from the 1920s that the attention to physical education for girls and women gained greater traction and became woven into worries about the quantity *and* the quality of the Indian population. The 1920s was, in fact, the period when population growth started being perceived as a problem in colonial India. In the view of Indian eugenicists, the reduction in India's population, however, should not disproportionately reduce those segments of the population that they considered "fit", namely the middle class comprising mainly upper caste Hindus,[12] whose women often observed purdah.

Within this framework, educated elite and middle-class Indian women vociferously discussed physical fitness in several English and vernacular publications across the political spectrum. In doing so, they engaged with new categorizations of Indian girlhood and womanhood in the context of the rising anticolonial nationalism. *Stri Darpan*, a Hindi magazine targeting literate women from the middle and upper-classes, dedicated a considerable amount of space to themes related to health and hygiene and carried several articles encouraging women to perform regular physical exercise notwithstanding the feeling of shame associated with a practice that, according to prejudice, was too masculine. In the magazine's pages, as shown by Maneesha Lal, we find recurring references to infant and maternal mortality, tuberculosis and other ailments allegedly connected to purdah, the larger picture being women's responsibility for strong children and for a nation free of disease.[13]

reproduced in Eunice de Souza (ed.), *Purdah. An Anthology* (New Delhi: OUP, 2004), 99–104. On Besant's educational views and efforts to make Indian girls 'ideal' Indian women see Chandra Lekha Singh, "Making 'ideal' Indian women: Annie Besant's engagement with the issue of women's education in early twentieth-century India", *Paedagogica Historica*, 54, no. 5 (2018): 606–25.

[11] See for instance, Lal Lajpat Rai, *The Problem of National Education in India* (London: Allen & Unwin, 1920), 149 ff. On the Indian adaptations of social Darwinism and eugenics see Luzia Savary, *Evolution, Race and Public Spheres in India: Vernacular Concepts and Sciences (1860–1930)* (London: Routledge 2019); Sarah Hodges, "South Asia's Eugenic Past", in A. Bashford and P. Levine (eds.), *The Oxford Handbook of the History of Eugenics* (Oxford: OUP, 2010), 228–42; Harald Fischer-Tiné, "From *Brahmacharya* to 'Conscious Race Culture': Victorian Discourses of 'Science' and Hindu Traditions in Early Indian Nationalism" in C. Bates (ed.), *Beyond Representation: Colonial and Postcolonial Constructions of Indian Identity* (Delhi: OUP, 2006), 230–259; Asha Nadkarni, *Eugenic Feminism: Reproductive Nationalism in the United States and India* (Minneapolis: University of Minnesota Press, 2006).

[12] Rahul Nair, "The Construction of a 'Population Problem' in Colonial India 1919–1947", *The Journal of Imperial and Commonwealth History 39*, n. 2 (2011), 227–247: here 229.

[13] See Maneesha Lal, "'The Ignorance of Women is the House of Illness': Gender, Nationalism and Health Reform in Colonial North India", in M. Sutphen and B. Andrews (eds.), *Medicine and Colonial*

For Indian women, then, keeping physically fit was a duty to the national "body politic at large". This was made clear in a 1920 article published on *Stri Dharma*, the official organ of the Women's Indian Association (WIA),[14] which interestingly gave exercise a religious twist in order to win the widespread resistance of the most conservative sections of Hindu society as well as to ground the debate in a nativist, if not anti-Muslim, perspective:[15]

> Women in India little realize that their state of health is either a blessing or a curse to the Motherland they love. If the women of a country are weakly, sickly, undergrown, physically underdeveloped, then the whole nation will become physically degenerate […]. Every young woman should continue the splendid religious exercises of Buskis [South Asian version of squats] and Dandas [South Asian version of push-ups] which were instituted by the Rishis. […] Less time should be passed in the closed confined air of the home.[16]

While it is necessary to understand this increased attention to the female body against the backdrop of the intensifying anticolonial nationalism, ideals of the modern girl[17] and the rise of a globalizing physical culture movement,[18] our picture

Identity (London and New York: Routledge, 2003), 14–40. See also by the same author "Purdah as Pathology: Gender and the Circulation of Medical Knowledge in Late Colonial India," in S. Hodges (ed.), *Reproductive Health in India: History, Politics, Controversies* (Delhi: Orient Longman, 2006), 85–114.

[14] Founded in Madras in 1917, this was one of the most important women's organizations of the time along with the National Council of Women in India (NCWI) and the All-India Women's Conference (AIWC). See Geraldine Forbes, *Women in Modern India* (Cambridge: CUP, 1996), 64–120.

[15] The Indian women addressed by the analyzed magazines were very often Hindu women. Through Muslim domination, purdah had in fact become common among the Hindu middle and upper classes especially in Northern India. In a cultural-political context characterized by increasing communal tensions, the subtext of discourses on purdah was many a time framed in anti-Muslim terms. In other words, Muslims were blamed for women's seclusion and Hindu women needed to be "freed" from such Islamic practice. But this did not detract from the fact that Muslim and Hindu women could be allied against purdah. On Muslim women and purdah see Margrit Pernau, *Emotions and Modernity in Colonial India: From Balance to Fervor* (Delhi: OUP, 2019), ch. 5 and by the same author, "Handlungkompetenz im Harem: Mädchenerziehung im indischen Fürstenstaat Hyderabad", in H. Fischer-Tiné (ed.), *Handeln und Verhandeln, Kolonialismus, transkulturelle Prozesse und Handlungkompetenz* (Münster: LIT, 2002), 91–12; Siobhan Lambert-Hurley, "Fostering Sisterhood: Muslim Women and the All-India Ladies' Association", *Journal of Women's History* 16, no. 2 (Summer 2004): 40–65; Karina Deutsch, "Muslim Women in Colonial North India 1920–1947: Politics, Law and Community Identity", PhD Thesis, Cambridge Univ. 1998, esp. ch. 3 and 4.

[16] "The Health of Women by Periammal", *Stri Dharma*, 1920, Vol. I, n. 20, 167–9.

[17] Priti Ramamurthy, "All-Consuming Nationalism: The Indian Modern Girl in the 1920s and 1930s" in A. E. Weinbaum at al. (eds), *The Modern Girl Around the World* (Durham: Duke University Press, 2008), 147–173.

[18] Sebastian Conrad, "Globalizing the Beautiful Body: Eugen Sandow, Bodybuilding, and the Ideal of Muscular Manliness at the Turn of the Twentieth Century", *Journal of World History* 32, no. 1 (2021): 95–125.

would be incomplete if the influence exerted by medical colonial ideas in terms of purdah and physical exercise were not taken into consideration.

Purdah, an indicator of female sexual purity as well as an important marker of social respectability and status, included a varied set of cultural practices aimed at enforcing female modesty and at regulating gender relations according to class, caste, and religion.[19] In the colonial view, however, the purdah system was an unproblematically homogenized symbol of the degraded condition of Indian womanhood,[20] while the *zenana* (the women's segregated quarters of a house) was demonized as a space of decadence, plight, and disease that needed educational, medical and scientific interventions. Purdah thus motivated various imperial and Indian nationalist commitments. On its emotional potency relied several Western and Indian women reformers to legitimize their interventions and carve out a new domain of gendered power for themselves.[21] As various studies have demonstrated, the conviction that the purdah-observing Indian women were trapped in the allegedly unhygienic *zenana* prompted the institutionalization of women-targeting colonial medicine from the 1870s onwards. On the one hand, depicting the *zenana* as a "separate world"[22] from which medical men were excluded, British and Indian medical women enhanced their employment opportunities in the still male-dominated medical profession.[23] On the other hand, the body of the *purdahnashin*—the

[19] Overall, upwardly mobile classes adopted purdah to conform to upper-caste standards in the effort to acquire the same reputability.

[20] See for example Souza (ed.), *Purdah*.

[21] Samiksha Sehrawat, *Colonial Medical Care in North India. Gender, State and Society* (Delhi: OUP, 2013), esp. ch. 4 and 5; Maina Chawla Singh, *Gender, Religion and Heathen Lands. American Missionary Women in India 1860s–1940s* (Abingdon and New York: Routledge, 2000); Mary Hancock "Gendering the Modern: Women and Home Science in India" in A. Burton. *Gender, Sexuality and Colonial Modernities*, (London and New York: Routledge 1999) 149–161; Eliza F. Kent, "Tamil Bible Women and the Zenana Missions of Colonial South India," *History of Religions* 39, no. 2 (November 1999): 117–149; Antoinette Burton, "Contesting the Zenana: The Mission to Make "Lady Doctors for India," 1874–1885", *Journal of British Studies* 35, no. 3 (1996): 368–97; Geraldine Forbes, "Medical Careers and Health Care for Indian Women: Patterns of Control", *Women's History Review* 3, no. 4 (1994): 515–30; Maneesha Lal, "The Politics of Gender and Medicine in Colonial India: The Countess of Dufferin's Fund, 1885–1888", *Bulletin of the History of Medicine* 68, no. 1 (1994): 29–66; Janaki Nair, "Uncovering the Zenana: Visions of Indian Womanhood in Englishwomen's Writings: 1813–1940," *Journal of Women's History* 2, no. 1 (Spring 1990): 8–34.

[22] Hanna Papanek and Gail Minault (eds.), *Separate Worlds: Studies of Purdah in South Asia* (Columbia, MO: South Asia Books, 1982).

[23] Scholars have demonstrated that reality was different. In fact, Indian women did not have easy access to male medical practitioners, the reasons being high costs and patriarchal structures which rendered women's health care secondary to men's. Moreover, even high-caste women could be willing to see male doctors, to whom the *zenanas* were accessible to provide their services to women (Lal, "The Politics of Gender", 39–43).

object of knowledge constructed as a malfunctioning organism that embodied the social disabilities of Indian women—constituted a site of civilizing effort and imposed imperial and nationalist obligations on women medical experts.[24]

One of the results of such initiatives was that, in a timespan of around thirty years, three important professional medical platforms spearheaded by British women and unofficially connected with the colonial government were founded.[25] These were the Dufferin Fund (1885, DF), the Association of Medical Women in India (1907, AMWI) and the Women's Medical Service (1913, WMSI).[26] Their emergence coincided with that of a clear medical discourse that tied the practice of purdah to specific diseases, like osteomalacia, tuberculosis, anemia, and to risks of maternal and infantile mortality.[27] Fixated on purdah and with its "apparently transhistorical, apolitical, and scientific aura", colonial medicine was "an effective agency of cultural colonialism"[28] that re-interpreted and reinforced ideologies of race and gender in medical and scientific terms. Moreover, the "apolitical" and "scientific" colonial medical discourse marginalized other socio-economic factors of women's ill health, such as colonial policies, poverty, malnutrition,[29] and stigma-

[24] According to Burton, providing medical care to the women of India grew into "the highest form of national-imperial service" (Burton, "Contesting the Zenana", 392).

[25] This connection made them co-participants in the imperial agenda that, as asserted by David Arnold, promoted Western medicine in order to advance the security of the colonial state. Such an agenda entailed subordinating and replacing "rival systems of ideas and authority", that is, indigenous medical systems and experts. See David Arnold, "Public Health and Public Power: Medicine and Hegemony in Colonial India", in Dagmar Engels and Shula Marks (eds.), *Contesting Colonial Hegemony: State and Society in Africa and India* (London: British Academic Press 1994), 152–172.

[26] This was run by the DF and the core of its employees were British women doctors of the AMWI (Sehrawat *Colonial Medical Care,* 182–4).

[27] Lal, "Purdah as Pathology". Maternal and infantile mortality were a social reality. According to a 1927 report, "in 1920 the Crude Infantile Mortality rate, which is calculated on the total number of deaths and births per year was 424 deaths per mille of births, while in 1925 it was 214 deaths per mille of births, and in 1926 it was 218 per mille of births" [Lady Chelmsford All-India League for Maternity and Child Welfare. Report of the Maternity and Child Welfare Conference, held at Delhi, 4–8 February 1927 (Delhi: Delhi Printing Works 1927), 138]. Maternal mortality, instead, from 21 per mille in 1920, dropped to 13 per mile in 1926 (ibidem, 139).

[28] Judy Whitehead, "Tropical Medicine and Inscriptions of Stigma: The Lessons of Katherine Mayo's *Mother India*", *Canadian Woman Studies/Les Cahiers de La Femme* 13, no. 1 (1992), 47–51, here 47.

[29] Ambalika Guha, *Colonial Modernities. Midwifery in Bengal c. 1870–1947* (Abingdon and New York: Routledge, 2018), *passim*; Sehrawat, *Colonial Medical Care*, (ch. 4 and 5); Lal, "Purdah as Pathology". Lisa Trivedi "Maternal Care and Global Public Health: Bombay and Manchester, 1900–1950", *Social History of Medicine* 34, Issue 1, (Feb. 2021): 46–69; Cecilia Van Hollen, *Birth on the Threshold: Childbirth and Modernity in South India*, (Berkeley and Los Angeles: University of California Press, 2003); Dagmar Engels, *Beyond Purdah?, Women in Bengal 1890–1939*, (Delhi: OUP 1996), 132–157. For a historical overview of maternal health policies in South Asia see Samiksha Sehrawat, "Colonial

tized traditional Indian birth attendants [*dhais*] as a "social pathology"[30] at the root of deaths surrounding childbirth.

Physical exercise figured among the effective remedies suggested by British and Indian medical journals against the diseases and physical debility brought about by purdah.[31] Since, for colonial medicine, Indian women's health meant essentially reproductive health, it is hardly surprising that the focus of the recommendations for physical exercise was "between the breasts and the knees".[32] According to Dr Rukhmabai (1864–1955), purdah was "an infliction on the natural dignity of womanhood and, on the purely physical side, results still in a deplorable lack of air and exercise and will lead to the physical deterioration of the race".[33] *The Work of Medical Women in India*, a 1929 book that celebrated the activities of the Association of Medical Women of India in the previous twenty years and that was written by two British members of the same association, stated that:

> The troubles during pregnancy and labour are not only due to the lack of medical aid, but to habits of life. The almost entire lack of physical exercise discourages metabolism and to this is often added an almost entire lack of sunshine and fresh air.[34]

Legacies and Maternal Health in South Asia", in C. Jullien and R. Jeffery (eds.), *Childbirth in South Asia. Old Challenges and New Paradoxes* (Oxford: OUP 2021), 40–67.

[30] Geraldine Forbes, *Women in Colonial India. Essays on Politics, Medicine and Historiography*, [New Delhi: Chronicle Books 2008 (2005)] p. 100. As noted by Forbes, not only British-dominated women's medical associations but also the Indian "new women" of the three main Indian women's organizations, enamored with Western science and motivated by issues of respectability and refinement, played an important role in marginalizing the *dhai*, namely the only caregiver to whom the larger female population had access. See *Ibidem*, 79–100. See also Sandhya Shetty, "(Dis)locating Gender Space and Medical Discourse in Colonial India" in C. Siegel and A. M. Kibbey (eds.), *Eroticism and Containment: Notes from the Flood Plain* (New York and London: NYU Press, 1994), 188–230. For a reconstruction of the attempts at "modernizing" the knowledge and work of the *dhai* in Bengal see Guha, *Colonial Modernities*, ch. 3. On this see also several of the contributions in the above-mentioned Report of the Maternity and Child Welfare Conference, held at Delhi, 4–8 February 1927. For discourses of motherhood and working-class women see Samita Sen, *Women and Labour in Late Colonial India: The Bengal Jute Industry* (Cambridge: CUP 1999), 142–76.

[31] See for example H. S. Hutchison and S. J. Shah, "The Aetiology of Rickets, Early and Late", *Quarterly Journal of Medicine* 15 (1922): 167–94; Grace Stapleton, "Late Rickets and Osteomalacia in Delhi", *Lancet* 103 (May 1925): 1119–23.

[32] Forbes, "Medical Careers", 525.

[33] "Dr Rukhmabai", in Souza (ed.), *Purdah*, 257. On Rukhmabai see Sudhir Chandra, *Enslaved Daughters. Colonialism, Law and Women's Rights* [Delhi: OUP, 2008 (1998)].

[34] Margaret Balfour and Ruth Young, *The Work of Medical Women in India* (Bombay: Humphrey Milford, OUP, 1929), 185. On Balfour and her role in maternal health in India see Engels, *Beyond Purdah?*, 132–134 and Sen, *Women and Labour*, 150–151.

The same book praised the work "nearly related to the medical one", namely "the opening and development of the Girl Guides movement" and "the initiation of classes of physical culture of girls by the YWCA and others."[35] The Girl Guide movement and the Young Women's Christian Association (YWCA), even though not dedicated primarily to physical culture, promoted—like local girls and young women clubs as well as several other colonial and Indian institutions and associations—an array of physical exercise schemes.[36] For instance, the Wellesley College graduate Florence Salzer was a YWCA member and director of physical education at the Isabella Thoburn College, an American Mission school and elite female institution in Lucknow. She wrote the manual *Physical Exercises and Games for Indian Girls*, published in 1932, with lesson plans "scientifically devised".[37] The book denounced some common Indian practices among Indian girls and women (such as balancing a big earthen pot on their hips) for jeopardizing their reproductive functions or for causing the birth of a deformed baby.[38] Salzer, former director of physical education in Rochester, New York, had been motivated to move to "wonderful" and "picturesque Hindustan" by the presence of "the shy Indian girls who ha[d] lived in a secluded 'purdah' all their lives", something which made her cause particularly worthy.[39] Physical exercise thus, under the tutelage of white women, equated to a mission to civilize: it was among the practices to inscribe within the daily habits and bodily disciplines of the Indian women "others".

From the second decade of the twentieth century, among the medical and obstetric research attached to the AMWI and the WMSI that posited the connection between seclusion and diseases affecting child delivery, several pelvimetric studies were conducted.[40] This literature attributed to the custom of purdah the worst

[35] Balfour, and Young, *The Work*, 185.

[36] On the Girl Guides see Kristine Alexander, *Guiding Modern Girls: Girlhood, Empire, and Internationalism in the 1920s and 1930s,* (Vancouver: University of British Columbia Press, 2017). On the YWCA see Karen Phoenix, "A Social Gospel for India", *The Journal of the Gilded Age and Progressive Era* 13, no. 2 (April 2014): 200–222. For the plethora of historical actors and institutions active in the promotion of physical fitness schemes in colonial India see Valdameri, 'Training Female Bodies'.

[37] The book was reviewed in *Teaching. A Quarterly Technical Journals for Teachers*, vol. VI (Sept. 1933–June 1934), 46.

[38] Sudipa Topdar, "The Corporeal Empire: Physical Education and Politicising Children's Bodies in Late Colonial Bengal", *Gender and History* 29, no. 1 (April 2017): 176–197, here 184.

[39] "Minnesotans You Should Know", *Minnesota Alumni Weekly*, March 23, 1929, 441.

[40] Supriya Guha, "The Nature of Woman: Medical Ideas in Colonial Bengal", *Indian Journal of Gender Studies* 3, no. 1 (1996): 23–38, here 30–32; Guha, *Colonial Modernities*, 166 and ff. Among the studies carried out in this period were: Kathleen Vaughan, "The Shape of the Pelvic Brim as a Determining Factor in Childbirth", *The British Medical Journal* 2, no. 3698 (1931): 939–941; Margaret Balfour, "Diseases of Pregnancy and Labour in India with Special Reference to Community", *Proceedings of the Seventh Congress of the Eastern Association for Tropical Medicine*, 1927, 318–28; Grace Stapleton, "Pelvic

cases of osteomalacia.[41] Leading to a softening of the bones, this disease produced deformity which, once the bones became hard again, was rendered permanent. Osteomalacia attracted chiefly the attention of obstetricians because, in pregnant women, it could cause contraction of the pelvis, a maternal condition that hindered the smooth passage of the fetal head during childbirth and that could result in difficult if not fatal delivery.

One prolific author of studies on pelvimetry was Kathleen Olga Vaughan (?—1956), whose work was widely published in the *British Medical Journal* and the *Lancet*. Her 1928 little volume *The Purdah System and Its Effect on Motherhood,* which became quite influential even beyond medical circles, clearly pathologized purdah and blamed it, together with "native" midwifery, for the high maternal mortality in the colony.[42] A review of the book claimed that it was "distressing to learn from this authoritative source that the evils of the purdah system were, if anything, understated by Miss Mayo."[43] The reviewer referred to American journalist Katherine Mayo's *Mother India* (1927), which rendered a derogatory account of Indian society and culture.[44] Based on "salient facts", Vaughan's *The Purdah System* was considered more reliable than Mayo's "impressions of a tourist."[45]

Vaughan was a British medical doctor, obstetrician and member of the AMWI who worked for around two decades in India. In 1903 she became superintendent of the Lady Dufferin Victoria Hospital in Calcutta and a few years later of the Diamond Jubilee Zenana Hospital in Srinagar, where she worked for three years.[46] During her medical service in Kashmir, Vaughan noticed the absence of contracted pelvis among women of the lower classes who were not confined in the *zenana*, such as the *manji* or boatwomen.[47] Vaughan was struck by the fact that better-off female city-dwellers suffered physically and mentally from childbirth, whereas women working in the fields or tending cattle, could deliver their children safely and "with no more difficulty than the animals around them have in parturition".

Measurements in Indian Women", *Journal of the Association of Medical Women in India* 15, no. 2 (1927): 8–11.

41 For instance, Kathleen Vaughan, *The Purdah System and Its Effect on Motherhood. Osteomalacia Caused By Absence of Light in India, etc.* (Cambridge: W. Heffer & Sons, 1928).

42 Vaughan, *The Purdah System*.

43 See "Lethal Social Customs", *The British Medical Journal* 2, no. 3529 (1928): 344–45, here 344.

44 Katherine Mayo, *Mother India*, (New York: Harcourt Brace and Company, 1927).

45 "Lethal Social Customs", 344.

46 "Obituary of Kathleen O. Vaughan", *The Medical Women's Federation Journal*, Vol. 39, n. 1 (January 1957), p. 138.

47 Kathleen Vaughan, "The Case for Antenatal Exercises", *Journal of the Association of Medical Women in India*, Vol. XXI, no. 1, (February 1943): 16–19 and Vaughan, *The Purdah System*, 10, 17. For a critical analysis see Lal, "Purdah as Pathology", 94–95; Guha, "The Nature of Woman", 29 ff., Guha, *Colonial Modernities*, 166–67.

The explanation she gave was that Indian rural women—romanticized and looked upon as strong and healthy despite the extreme poverty and exposure to disease they suffered—led active lives that involved exercises that contributed to keeping the pelvic anatomy healthy and functional.[48] It was in the squatting position assumed by the "native" races of the East for defecation, as well as for work or rest, that pelvic development was perfect and childbirth easy.[49] Vaughan wrote:

> The city dwellers, and especially women who on account of the custom known as "purdah" must remain in seclusion and live indoors from 8 years old and onwards, […] find their confinements increasingly difficult and dangerous for themselves and their offspring. In China, the women who bind the feet are the class from which the difficult obstetric cases come.[50]

According to Vaughan, ease of parturition was not a question of pelvis size as tied to race but of a certain "manner of life":

> The negress provides a good illustration. In her natural surroundings she gives birth to children with ease, but in America, […] living in big cities such as New York and Baltimore, […] she has more obstetric difficulties than the American white woman herself, and […] this must be due to something in the manner of life in the crowded quarters of great cities.[51]

The pelvic brim and the fetal head, Vaughan argued, were meant to fit and when this was not the case it was a matter of an undeveloped pelvis, due to ankylosis of the sacro-iliac joints. In other words, the lack of mobility associated with "civilised conditions and habits"[52]—and not only to heathen customs—had made the pelvis

[48] Vaughan, "The Shape of the Pelvic Brim", 940. For recent discussions on the long-lasting romanticization of "Oriental poverty" see, for instance, Barbara Schmidt-Haberkamp, Marion Gymnich and Klaus P. Schneider (eds.), *Representing Poverty and Precarity in a Postcolonial World* (Leiden, Brill, 2018).

[49] Kathleen Vaughan, "The Enlargement of the Pelvis in the Squatting Position and the Necessity of Exercise for the Pelvic Joints", *Journal of the Association of Medical Women in India XIII*, no. 3 (August 1935): 31–39. Radiograms confirmed the enlargement of the pelvic brim in the squatting position. "The Effect of Posture on the Pelvic Canal", *The Lancet*, Feb. 17 (1934): 360.

[50] Vaughan, "The Shape of the Pelvic Brim", 939.

[51] Vaughan, "The Shape of the Pelvic Brim", 940. Vaughan did not show any awareness of racial disparities in terms of maternal and infantile mortality in the United States, where black women were (and still are) more likely to die due to the influence of racial ideas and stereotypes on diagnoses and treatments. See Hoberman, "The Primitive Pelvis", and, for a contemporary account, Khiara M. Bridges, *Reproducing Race: An Ethnography of Pregnancy as a Site of Racialization* (Los Angeles: University of California Press, 2011).

[52] Kathleen Vaughan, "The Expanding Pelvis", *British Medical Journal*, June 27 (1942): 786–7, here 787.

rigid and deprived it of its natural elasticity.[53] Through active life and specific exercise the proper development of the female pelvis and a healthy and smooth delivery could be ensured, regardless of race.[54]

With her medical research disputing the existence of a clear relation between the female pelvis and race, Vaughan questioned, at least to some degree, the "science" of pelvimetry that had originated in the nineteenth century and had since then asserted a hierarchy of races.[55] In claiming that through physical exercise the pelvis could become more flexible—and maternity, as a natural function, "easy and safe"—she placated evolutionist fears about pelvises not seeming to keep pace with heads getting larger with the advancement of civilization.[56]

The trajectory of Vaughan's career after returning to England is an interesting one. While in the subcontinent she exploited purdah as a productive site for establishing her Western medical authority, once back in Europe she capitalized on her previous experience in India to take part in the rising medical movement that criticized the heavy medicalization of pregnancy and birth.[57] Vaughan became involved in projects at the St Thomas Maternity Hospital as well as in the maternity departments of Paddington and St Mary Abbot's Hospitals, London, where she

[53] The view that delivery was a natural and normal function when the size of the mother's pelvis fitted the size of the child's head had been also espoused by a professor of anatomy of the Medical College in Calcutta [See Pan N., "Measurements of the Pelvis in Hindu Females", *Journal of Anatomy*, Vol. 63 (Pt 2), (January 1929): 263–6].

[54] Kathleen Vaughan, *Safe Childbirth: The Three Essentials* (London: Baillière, Tindall and Cox 1937), *passim*; "The Case for Antenatal Exercises", and "The Enlargement of the Pelvis".

[55] The colonial medical doctor Albert Cook reached similar conclusions in Uganda in the 1930s. Focusing on Baganda women, he argued that their maternal problems were rooted in cultural and heathen customs and not in racial anatomy. His findings were strongly opposed by medical doctors that did not want to give up a racialist and evolutionist understanding of the female pelvis. See Nakakyike Musisi and Seggane Musisi, "Inimitable Colonial Anxiety: African Sexuality in Uganda's Medical History, 1900–1945", in Poonam Bala (ed.), *Medicine and Colonial Engagements in India and sub-Saharan Africa* (Newcastle upon Tyne: Cambridge Scholars Publishing, 2018) 131–153, esp. 142–43. For critical analyses of pelvimetry see fn. 1 above. Racial explanations of pelvic variations continued to be discussed well into the second half of the twentieth century. See for example, Herbert Thoms, *Pelvimetry* (London: Cassel and Company Limited 1956), 41, 55.

[56] Vaughan, "The Shape", 940–941.

[57] Joanna Bourke, "Becoming the 'Natural' Mother in Britain and North America: Power, Emotions and the Labour of Childbirth Between 1947 and 1967", *Past & Present 246*, no. Supplement_15 (December 2020): 92–114. Jessica Martucci, *Back to the Breast: Natural Motherhood and Breastfeeding in America,* (Chicago and London*:* University of Chicago Press 2015), esp. ch, 1; Ornella Moscucci, "Holistic Obstetrics: The Origins of "Natural Childbirth" in Britain", *Postgraduate Medical Journal* 79, no. 929 (2003): 168–73; Jenny Kitzinger "Strategies of the Early Childbirth Movement: A Case-Study of the National Childbirth Trust", in J. Garcia, R. Kilpatrick, M. Richards (eds.), *The Politics of Maternity Care: Services for Childbearing Women in Twentieth-century Britain* (Oxford: Clarendon Press 1990), 92–115.

was instrumental in starting prenatal and postnatal physical training for women preparing and recovering from the "athletic feat" of childbirth.[58] Through her publications and obstetric practice, Vaughan propounded the need of pregnant Western women to "go native" by embracing habits commonly associated with supposedly less civilized peoples.[59] These practices included adopting the squatting position daily for defecation and during labor as well as taking to the physical exercises normally carried out in their everyday life by "native races", otherwise portrayed in the dominant medical discourse as ignorant, diseased, deformed and unable to take care of their body.[60] Recognizing the "native" habits as something that could be appropriated, Vaughan's views cut through colonizer/colonized, Western/non-Western, scientific/unscientific binaries and revealed slippages from the pathologization of race and gender to the pathologization of civilization.

Vaughan's "culturalist" call was not isolated in the period under purview. In Fascist Italy, for example, Giuseppe Poggi-Longostrevi, one of the founders of the Federazione Italiana Medici Sportivi, claimed that "if Italian girls could follow the example of the balanced and fecund women of primitive societies who practice a sort of "natural" athletics, they too would be able to develop their abdominal muscles, favoring beauty and maternity at the same time".[61] Sexual hygiene and birth control activist, Ettie Rout, a Tasmania-born New Zealander who settled down in London after the Second World War, was of a similar opinion. In her physical culture manual, recommended by medical doctors too, *Sex and Exercise*,[62] she argued that the efficiency of intercourse, pregnancy and labor depended on a healthy pelvic floor and abdominal area. The book promoted a system of "rhythmic rotary" pelvic and hip exercises based on "native dances" and aimed at strengthening the abdominal, gluteal, and pelvic muscles. In her view, "primitive" women, thanks to their dances, enjoyed better muscular development and organic health than "civilized" women, and unlike these, they had no difficulties in recovering from childbirth.[63]

[58] See Jonathan Hoffman & C. Philip Gabel, "The Origins of Western Mind–Body Exercise Methods", *Physical Therapy Reviews* 20, no. 5–6 (2015): 315–324. See the 1939 video in which expectant mothers in Paddington hospital are shown practicing delivery-preparatory physical exercises designed by Vaughan, "Childbirth as an Athletic Feat", 1939, Wellcome Library, available at https://www.youtube.com/watch?v=g9wRBWDxReY

[59] Kathleen Vaughan, *Exercises Before Childbirth* (London: Faber and Faber Limited, 1951).

[60] For instance, Forbes, *Women in Colonial India,* 79–100. Hodes, "The 'Hottentot Apron'".

[61] Quoted in Gigliola Gori, *Italian Fascism and the Female Body: Sport, Submissive Women and Strong Mothers* (Abingdon: Routledge, 2004), 88.

[62] Ettie A. Rout, *Sex and Exercise: A Study of the Sex Function in Women and Its Relation to Exercise* (London: William Heinemann, 1925).

[63] Ina Zweiniger-Bargielowska, "The Making of a Modern Female Body: Beauty, Health and Fitness in Interwar Britain", *Women's History Review* 20, no. 2 (2011): 299–317, here 304–6. See also Jane Tolerton,

Similar cultural appropriations, however, far from blurring cultural boundaries and threatening "the authority of oppositions sacred to the colonial project,"[64] shed light on the ambivalent and contrasting ways medical and obstetrical research and observations carried out in the colony could be deployed. They were used in the colonies themselves as "matériel for the social and political battle against "primitive" or "uncivilized" cultural practices,"[65] whereas, in the metropolitan centers, as tools of professional advancement and white bodily improvement against fears of racial degeneration.[66]

Strengthening the Nation Through the Female Pelvis

Discourses connecting an underdeveloped pelvis and maternal and infantile mortality with a lack of mobility found ready purchase among Indian physical culture experts who, with their nationalist and eugenicist inclinations, saw healthy women's bodies as crucial in ensuring a strong progeny.[67] The attention that these experts paid to the female pelvis, not so evident before the 1930s, can be explained as the outcome of interlinked global and Indian developments.

At the global level, the call for a "scientific" approach to physical education, informed by enduring biomedical and scientific theories and notions about sex differences, advocated forms of physical activity suited to women's anatomy and physiology.[68] Such views reflected transcultural dominant beliefs about women's social role and gave cautionary recommendations: women should engage in moderate activity, balanced by an appropriate measure of rest, to avoid any debilitating effect on their reproductive capacities.[69]

At the India level, instead, the concern of Indian physical culture experts about women's pelvic health can be explained as part of the broader strong reaction of

"A Lifetime of Campaigning: Ettie Rout, Emancipationist beyond the Pale" in J. A. Mangan and Fan Hong (eds.), *Freeing the Female Body: Inspirational Icons* (Abingdon and New York: Frank Cass Pub., 2001), 73–97.

[64] Gyan Prakash, "Science 'Gone Native' in Colonial India", *Representations*, no. 40 (1992): 153–78, here 155.

[65] Roberta Bivins, "'The English Disease' or 'Asian Rickets'?", *Bulletin of the History of Medicine* 81, no. 3 (2007): 533–68, here 541.

[66] Vaughan explicitly referred to maternal and infant mortality in England in terms of racial degeneration in her book *Safe Childbirth*, 1–29.

[67] Mark Singleton, "Yoga, Eugenics, and Spiritual Darwinism in the Early Twentieth Century", *International Journal of Hindu Studies* 11, no. 2 (2007): 125–46.

[68] Jan Todd, *Physical Culture and the Body Beautiful: Purposive Exercise in the Lives of American Women, 1800–1870* (Macon: Mercer University Press 1998), 137–170.

[69] For instance, Patricia Vertinsky, *The Eternally Wounded Woman: Women, Doctors and Exercise in the Late Nineteenth Century* (Manchester: Manchester University Press, 1990).

Indian nationalists to Mayo's *Mother India*. Intending to discredit Indians' claims to political autonomy, the book focused on child marriage and on the poor conditions of mothers, blaming an inherently "backward" Hindu culture for India's social ills.[70] In presenting purdah as one such social ill, Mayo relied on several official documents and reports, among which figured medical publications.[71] The name of Vaughan as well as those of other women doctors of the AMWI appear repeatedly in the American journalist's book and so do references to conditions affecting the female pelvis.[72] Thus, through multiple channels such as books like *Mother India* and *The Purdah System*, newspaper columns, women's magazines etc., colonial medical knowledge about Indian female bodies circulated and reached audiences beyond the narrow medical circles.

Indian physical educators, eager to acquire credibility and carve out a professional niche in a field that was increasingly scientized and transculturated, proved their expertise adopting globally-circulating theories and notions. Among physical culture experts in India, yoga specialists, consciously preoccupied with the "modernisation of tradition,"[73] were particularly receptive to biomedical and scientific research. In a climate of intense experimentation informed by a mix of rejection and assimilation of foreign modes of exercise, they presented yoga as the epitome of an essentially Hindu "national" scientific system of physical culture that could contribute to the nation-building project.[74] Framing embodied yoga technique's concern with health and better body functions in an explicitly nationalist discourse afforded them a certain prominence in the field of physical culture.[75]

The beneficial physiological functions that yoga experts attributed to yoga fitted well with the fact that female bodies were tightly tied to medical notions and to always imperiled reproductive mechanisms. In his 1933 publication *Aasanas* (Yoga Postures), for instance, Swami Kuvalayananda (1883–1966), one of the most important promoters of modern yoga at the national and international level, wrote:

[70] See among others Mrinalini Sinha, *Specters of Mother India: The Global Restructuring of an Empire* (Durham, NC: Duke University Press, 2006), Ishita Pande, *Sex, Law, and the Politics of Age. Child Marriage in India, 1891–1937* (Cambridge: CUP, 2020) and Bhaswati Chatterjee, "Child Marriage and the Second Social Reform Movement", in S. Sen and A, Ghosh (eds.), *Love, Labour and Law. Early and Child Marriage in India* (New Delhi: Sage, 2021), 29–62.

[71] Whitehead, "Tropical Medicine". Mrinalini Sinha convincingly shows that these "facts" of *Mother India* were widely debated and appropriated within competing imperial and nationalist narratives (*Specters of Mother India*, esp. 109–151)

[72] For mentions of Vaughan see Mayo, *Mother India*, 95 ff.

[73] See Joseph S. Alter, "Yoga at the *Fin de Siècle*: Muscular Christianity with a 'Hindu' Twist", *The International Journal of the History of Sport 23*, n. 5 (2006): 759–776.

[74] Mark Singleton, *Yoga Body*: *The Origins of Modern Posture Practice* (New York: OUP, 2010), 81–111.

[75] Joseph Alter, "Body, Text, Nation: Writing the Physically Fit Body in Post-Colonial India" in J.H. Mills and S. Sen (eds.), *Confronting the Body* (London: Anthem, 2004), 16–39.

> Weak abdominal and pelvic muscles in the females are often responsible for the alarmingly large maternal mortality and the surprisingly large number of miscarriages in India […]. So far as the thoracic and abdominal muscles are concerned, Yogic poses do train them quite satisfactorily. […] if the student is a female, she can be sure of healthy pregnancy and safe delivery.[76]

Kuvalayananda argued that the yogic physical culture of *āsana* and *prānāyāma* was a science that could generate healthy and muscular bodies and, as such, should be disseminated to the larger population in schools and colleges to serve the nationalist project and rebut the colonial image of a sickly Indian population.[77] The recommendations of the Bombay Government Committee of Physical Education in 1937,[78] of which Kuvalayananda was chairman until 1950, drew largely from the knowledge generated through his yoga experiments as well as from Western anatomical studies and physical training schemes that gave scientific authority to the former. Together, these focused on the perceived need to provide girls in primary and secondary schools with specific exercises to train their abdomen and pelvis to contain "the appalling maternal mortality which swe[pt] away 150,000 to 200,000 Indian mothers every year".[79] Due to the still widespread evolutionist belief that "the development within the civilised races tend[ed] more and more to produce children born with large heads", to have stronger and wider pelvises was seen as vital. But this could be achieved only through mild exercises accompanied by music, whereas track and field events and combative group games, recommended only for boys because seen as essentially masculine, had to be omitted from the curricula.[80] Exercises that involved strength, courage, stamina, competition or other characteristics which were considered "unfeminine" according to patriarchal ideals or "common sense" were branded as inappropriate for girls and women with the support of medical arguments. Discourses around yoga, thus, contributed to nationalist patriarchal projections that placed on the girl child the burden of

[76] Swami Kuvalayananda, *Aasanas* [Lonavla: Kaivalyadhama, 2012 (1933)], 104.

[77] See Mark Singleton, "Transnational Exchange and the Genesis of Modern Postural Yoga", in B. Hauser (ed.), *Yoga Traveling. Bodily Practice in Transnational Perspective* (Cham: Springer 2013), 37–56; Joseph Alter, "Yoga and Physical Education: Swami Kuvalayananda's Nationalist Project," *Asian Medicine* 3 (2007): 20–36; Joseph Alter, *Yoga in Modern India: The Body between Science and Philosophy* (Princeton: Princeton University Press, 2004), 73–108.

[78] The 1919 India Act introduced dyarchy, namely a partial decentralization of the colonial powers in favor of a limited number of elected middle-class Indians. Local self-government, education, health, public works, industry and agriculture were among the subjects transferred.

[79] *Bombay Government Report of the Physical Education Committee 1937* (Bombay: Gov. Central Press, 1938), 19.

[80] *Physical Education Committee 1937*, 19.

reproduction as early as in her primary school years. Ironically, in a historical moment in which, as shown by Ishita Pande, childhood was defined as a moral category and pressure point in politics,[81] the girl child could not escape the mother she would have to become, while "the possibility of spontaneity and discovery as befits the stage of girlhood" was largely erased.[82]

A look at the works referred to by the committee, whose recommendations were subsequently employed by the United Provinces government in its educational institutes,[83] reveals not only a process of multidirectional citations but also the transnational mobility and scientific resonance of claims surrounding the female pelvis. Among these works we find two that are particularly worth mentioning. One is *The Theory of Gymnastics*, by Johannes Lindhard, a Danish medical doctor that had a huge influence on the gendering of physical exercise.[84] He argued that vigorous exercises would influence the shape of the feminine pelvis which would tend to approach the male type with children having "to pay with their lives for the imperfectly developed parturition mechanism of their mothers".[85] These arguments were based on contemporary theories of "masculinization" and echoed late nineteenth-century theories of sex reversal,[86] according to which women taking up sport lost their femininity, tended to turn away from heterosexuality, might lose their ability to bear children or might even have "defective" ones.[87] The citation of *Sex Efficiency Through Exercises* by the Dutch gynecologist Theodor H. Van De Velde showcases, instead, the selective ways in which medical advice was adopted by Indian physical educators. Van de Velde's *Sex Efficiency* promoted pelvic exercises with a view to improve women's two special functions as sex partners and mothers so that they could be put "in the position to exert an active influence in coitus […] by accentuating the sensations of mutual pleasure" as well as keep "healthy and ready for the heavy ordeal [of giving birth]".[88] However, the Indian Committee completely

[81] Pande, *Sex, Law, and the Politics of Age*.

[82] Ruby Lal, "Recasting the Women's Question", *Interventions* 10, no. 3 (2008): 321–39, here 322. In the same article, the discussion about the conflation of the notions of girl and woman is relevant.

[83] Singleton, *Yoga Body*, 115; Alter, "Yoga and Physical Education", 31–33.

[84] Hans Bonde, "Projection of Male Fantasies: The Creation of "Scientific" Female Gymnastics", *The International Journal of the History of Sport* 29, no. 2 (2012): 228–46.

[85] Lindhard, *The Theory of Gymnastics* (London: Methuen and Company, 1934), 67.

[86] Lisa Carstens, "Unbecoming Women: Sex Reversal in the Scientific Discourse on Female Deviance in Britain, 1880–1920", *Journal of the History of Sexuality*, 20, no.1 (2011): 62–94.

[87] The famous German gynecologist Hugo Sellheim was one of the promoters of this theory. See Gertrud Pfister, "The Medical Discourse on Female Physical Culture in Germany in the 19th and Early 20th Centuries", *Journal of Sport History* 17, no. 2 (1990): 183–98.

[88] Theodor H. van De Velde, *Sex Efficiency Through Exercises: Special Physical Culture for Women* (London 1932), 13. The work of Van De Velde was popular in India and Japan. Karve cited his publications (See Shrikant Botre and Douglas E. Haynes "Understanding R.D. Karve. Brahmacharya,

ignored the purpose of exercises against women's passivity in sexual intercourse and simply focused on their value in terms of having a safe delivery. Despite the liberating aspects of his pelvic exercises, Van de Velde cautioned against "violent and prolonged gymnastic exercise" as they posed a great strain on girls and women. The feminine pelvic region could be often injured by "lack of judgement" shown in games, gymnastics and athletics, the consequences becoming visible only in crucial moments like during pregnancy. The "golden mean" was the rule. Overall, in Van de Velde's view, athletic women were "not particularly adapted for motherhood. Rather the reverse."[89]

The same Bombay Committee gathered in 1945–46 and published a lengthy and up-to-date report, in which the pelvis was still prominent when physical education for girls and women was discussed. The report referred to *A Modern Philosophy of Physical Education*, by Agnes R. Wayman,[90] one of the most prominent physical educators in the United States and promoter of views against women's competition in sports.[91] According to Wayman, Head of the Department of Physical Education, at Barnard College, Columbia University, women's physical education "should be based upon sound educational psychology as well as upon sound physiological, anatomical and biological principles […]. It should be governed by the fact that every girl is a potential mother, that every girl is a future citizen".[92] What was

Modernity and the appropriation of Global Sexual Science in Western India, 1927–1953", in *Global History of Sexual Science*, 163–85, here 169, whereas Indian sexologist A. Pillay in his work *The Art of Love and Sane Sex Living* (Bombay: D.B. Taraporevala Sons & Co, n.d., 1948, 17th edition), 174–80, referred to his pelvic exercises. In Japan, Van De Velde's work became quite influential especially after the Second World War (See in the same volume Mark McLelland, "Takahashi Tetsu and Popular Sexology in Early Postwar Japan 1945–70", 211–231, here 216–17).

[89] Van de Velde, *Sex Efficiency*, 54–55. Similar arguments based on hard to die theories on the female body vis-à-vis sport participation were widely circulating in the 1930s. Van de Velde in particular drew on the studies of the already mentioned German gynecologist Hugo Sellheim and of Stefan Westmann who discouraged women from taking part in competitive and strenuous sports. See Pfister, "The Medical Discourse".

[90] Agnes R. Wayman, *A Modern Philosophy of Physical Education for Girls and Women and for the College Freshman Program* (Philadelphia: W.B. Saunders, 1938).

[91] Agnes R. Wayman, *Education through Physical Education: Its Organization and Administration for Girls and Women* (Philadelphia and New York: Lea & Febiger, 1925), 121, 162–64. Karen V. Epstein, "Sameness or Difference? Class, Gender, Sport, the Wdnaaf and the Ncaa/Naaf", *The International Journal of the History of Sport* 9, no. 2 (1992): 280–87 and Lynn E. Couturier, "'Play with Us, Not Against Us': The Debate About Play Days in the Regulation of Women's Sport", *The International Journal of the History of Sport* 25., no. (2008): 421–42.

[92] Wayman, *Education through Physical Education*, 59. On sex differences arguments made by women physical educators in the US see Martha H. Verbrugge, "Recreating the Body: Women's Physical Education and the Science of Sex Differences in America, 1900–1940", *Bulletin of the History of Medicine* 71, no. 2 (1997): 273–304.

worrisome for the Indian committee were the observations carried out by Wayman demonstrating that "the modern girls undoubtedly have smaller hips and tend towards the masculine type",[93] something which resonated with Indian apprehensions towards women embracing a modern lifestyle.[94]

The "scientific" principles on which the gender-differentiation of physical exercise was supposedly based were debated in newspapers too. For instance, a *Bombay Chronicle* reader, whose nom de plume—Athleticus—leads us to believe that this was someone connected to the milieu of physical education, and obviously a man, wrote a polemic letter to the newspaper denouncing the "idiocy of the 'physical culture' quacks" that trained little girls and young women in vigorous gymnasium exercises and standardized drills.[95] Athleticus instead praised "the tradition of the Swedish Manual" and the work of J. P. Müller, the Danish promoter of the nationalistic system of gymnastics, that had a strong eugenicist bent and was based on raising the level of the race as a whole.[96] Athleticus valued in particular the fact that these schemes:

> Differentiat[ed] between men and women […], between the male pelvis and the female […]. That is why, while boys and girls may do certain standardized drill-exercises, the latter are required to stop them at a point where the continuance of a common programme is likely to injure their physical development which proceeds along the purely biologic lines. Any physical exercise that involves an undue strain on the [female] beautifully sensitive and fine nervous system, impedes the growth of the bone structure of the pelvis or hardens the thigh muscle is avoided because it produces repercussions that endanger parturition and even woman's life.[97]

In the period under review, the large majority of Indian physical educators were men, their advice equating to patriarchal sanctions. However, especially in the

[93] Quoted from *Bombay Government Report of the Physical Education Committee 1945–46* (Bombay: Gov. Central Press, 1947), 26.

[94] Similar fears were expressed in Fascist Italy by the endocrinologist Nicola Pende, "Costituzione e fecondità", in Corrado Gini (ed.), *Atti del Congresso internazionale per gli studi sulla popolazione* (Roma, 7–10 settembre 1931-IX), Vol. 3, Rome: Istituto Poligrafico dello Stato 1933, 77–101. On the Indian modern girl see Priti Ramamurthy, "The Modern Girl in India in the Interwar Years: Interracial Intimacies, International Competition, and Historical Eclipsing." *Women's Studies Quarterly* 34, no. 1/2 (2006): 197–226.

[95] "Physical Culture for Women. Plea for Scientific Outlook: A Criticism" by "Athleticus", *Bombay Chronicle*, 8 August 1936, 6.

[96] Singleton, *Yoga Body*, 98. Müller published a work *My System* in 1904 and *My System for Ladies* in 1915 that, as shown by the reference, remained very popular for the following decades. See Watt, "Physical Culture and the Body", 346–9.

[97] "Physical Culture for Women".

growing field of yoga, a few women, generally wives or daughters of famous male yoga experts, started to emerge and establish themselves from the 1930s on. One such example is Sitadevi Yogendra (1912–2008), married to Shri Yogendra (1897–1989), the founder of the renowned Bombay Yoga Institute. Her 1934 *Yoga: Physical Education for Women*, the first modern yoga book ever written by a woman, intended to demonstrate "the scientific foundation of physical education for women".[98] Being a "non-violent and non-fatiguing activity" and as such suitable for women,[99] yoga is presented by Sitadevi as having been revived by a new scientific vigor that had provided it with greater authority. Her views were not different from those of her male colleagues regarding physical, physiological and psychological sex differences. A great deal of importance was paid to a wide pelvis and to ovaries. Their impaired functions, caused by the loss of proportions produced by "the tragic folly of muscle-cult and body building", could affect the "charm, personality and behaviour of women", while jeopardizing their "genetic, social and moral responsibilities [… towards] the future citizens of the world".[100]

Overall, the medical arguments selectively embraced by the above-mentioned Indian experts are revealing of the kind of physical exercise they wanted for Indian women. The same arguments also served the purpose of depoliticizing the issue of equality between men and women and thus naturalizing patriarchal ideals and conventional views of women's social role in society. In other words, motivating their recommendations on the basis of health or disease gave experts the ideological benefit to dodge controversial issues and present their claims as incontrovertible qua informed by scientific notions and ideas. Moreover, presenting themselves as co-producers of pidginized forms of knowledge, theirs was not simply an uncritical and unshakable faith in the scientific knowledge produced in the West.[101] On the contrary, they were agents in a process of knowledge hybridization which gave them increased authority by showing that Western science confirmed the benefits of their putatively indigenous ancient knowledge.[102]

[98] Sitadevi Yogendra, *Yoga Physical Education for Women* [Bombay: The Yoga Institute, 1947 (3rd edition)], 13.

[99] Sitadevi, *Yoga*, 31.

[100] Sitadevi, *Yoga*, 35, 82, 24.

[101] Even though the category of "Western science" is analytically untenable, this designation of science as Western is a durable construction of the interacting positivist and colonial discourses. A classic study is Jan Golinski, "Is it Time to Forget Science? Reflections on Singular Science and Its History," *Osiris* 27,1 (2012): 19–36; for a more recent intervention see Kapil Raj, "Beyond Postcolonialism … and Postpositivism: Circulation and the Global History of Science", *Isis* 104, n. 2 (2013), 337–347.

[102] A rich body of scholarship has been produced on the topic of knowledge circulation, hybridization, vernacularization and co-production. See, for instance, Projit Bihari Mukharji, *Doctoring Traditions: Ayurveda, Small Technologies, and Braided Sciences* (Chicago and London: University of Chicago Press, 2016); Kapil Raj, "Networks of Knowledge, or Spaces of Circulation? The Birth of British

Conclusion

This chapter has analyzed a facet of the thus-far neglected history of women's physical education in colonial South Asia. It has done so by showing that women medical doctors' views about purdah as a factor of maternal mortality contributed to emphasizing the importance of physical exercise for girls and women. Overall, the emphasis on the female pelvis and on its role in child delivery played an important part in the gender stratification of physical exercise and resonated with the disquiet about the "degenerate" state of the existing Hindu society and with calls for racial regeneration. The new attention to the physically fit female body thus resulted in new discursive alliances between medical doctors, social reformers and physical education experts that could transcend the colonizer/colonized divide.

The chapter has shown that the medical research and observations about conditions supposedly correlated with the custom of purdah and affecting the pelvis and healthy child deliveries could take very different directions and have an impact beyond India. The case study of Kathleen Vaughan has revealed that her work on pelvimetry challenged dominant medico-scientific views that attributed the size of the pelvis and complications during childbirth to race. Drawing parallels between purdah and modern civilization, Vaughan saw in an insufficiently active lifestyle the causes of pelvic anatomical anomalies and attendant difficult, if not fatal, child deliveries. Once back in England, Vaughan started prenatal physical exercise programs that, inspired by the everyday habit of squatting observed in the "Oriental" races, made her a harbinger of the natural childbirth movement who could think beyond Western/non-Western, scientific/unscientific, civilized/uncivilized dichotomies. As such, Vaughan deserves further research and can be equated to better known figures, like the American anthropologist Margaret Mead, who became a strong advocate of the ideology of "natural" motherhood after conducting fieldworks in New Guinea and Bali.[103]

In India, physical exercise for girls and women was scrutinized and scientized by the Indian physical culture experts considered in the foregoing account. This development was in line with a broader phenomenon underway at the global level, where schemes of physical education had to be rational and scientific in order to be judged as authoritative, worthy and safe for the "fragile" female body. So, in the process of carving out their professional niche and appearing as credible

Cartography in Colonial South Asia in the Late Eighteenth Century", *Global Intellectual History 2*, n. 1 (2017), 49–66; Raj, "Beyond Postcolonialism"; Deepak Kumar, "Unequal Contenders, Uneven Ground: Medical Encounters in British India, 1820–1920", in A. Cunningham and B. Andrews (eds.), *Western Medicine as Contested Knowledge* (Manchester: Manchester University Press, 1997), 172–211.

[103] On Mead see Martucci, *Back to Breast*, 45–55.

physical educators, Indian experts had at their disposal a rich body of literature to draw from. Such international medico-scientific publications were selectively appropriated and readapted to justify prescriptive agendas of nationalism and patriarchy. In doing so, Indian physical educators and yoga experts showed the ability of marshaling the existing biomedical and scientific knowledge to keep control over female bodies through a conscious politics of citation.[104] Their ideas were a mixture of cultural adaptation, "pidginized" innovation, and commitment to what they presented as Indian (Hindu) tradition.

What is particularly interesting is the fact that the female pelvis, used to tailor physical exercise for girls and women to their being perceived as reproductive vehicles, provided experts with a putatively "natural" instrument to enforce hegemonic gender identities and gendered bodies. In this way, male anxieties over women's athletic ability, competition and independence—anxieties that echoed the one on women's education at large[105]—could be kept at bay. The disproportionate attention given to a healthy pelvis and to physical exercise, however, had the hidden potential to engender women's emancipation. In other words, Indian women were provided with the possibility to claim an active physicality within the discourse of racial regeneration and national health and beyond the binaries of home confinement and mobility. All in all, linking female physical fitness with the goal of improving the nation, the "new patriarchy" advocated by nationalism bound women to a new legitimate subordination[106] and, at the same time, increased their space of maneuver in ways that men at pain to check female bodies had not anticipated.

[104] A similar process of selective citation that was used to render patriarchal and upper-caste practice hegemonic is discussed in Shefali Chandra, "Decolonising the Orgasm: Caste, Whiteness and Knowledge Production at the 'End of Empire'", *South Asia: Journal of South Asian Studies* 43, no. 6 (2020): 1179–95.

[105] Among many others, see Tim Allender, *Learning Femininity in Colonial India, 1820–1932* (Manchester: Manchester University Press, 2016).

[106] Partha Chatterjee, "Colonialism, Nationalism, and Colonialized Women: The Contest in India", *American Ethnologist* 16, no. 4 (1989): 622–33.

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