

Mountaineering, Masculinity, and the Male Body in Mid-Victorian Britain

by *Michael S. Reidy**

ABSTRACT

Golden-age mountaineers attempted to codify gender, like flora and fauna, by altitude. They zoned the high Alps masculine. As women also reached into the highest regions, male alpinists increasingly turned to their bodies, and the bodies of their guides, to give scientific validity to their all-male preserve. Edward Whymper traveled to the Andes in 1879, where he transformed Chimborazo into a laboratory and his own body and those of his guides into scientific objects. His work helped spearhead a field-based, vertical approach to human physiology that proliferated after the turn of the century. By viewing gender through a spatial lens and using the sides of mountains to map it, this essay highlights the gendered notions that directed early research in high-altitude physiology.

The fact is—and it cannot be too strongly insisted on—that there really exist three distinct Switzerlands, suspended one over the other at different altitudes. The first—the Switzerland of ladies, children, elderly gentlemen, and ordinary folk in general—includes all the valleys and lakes traversed by railways, high-way roads, and steamers. . . . The second region . . . takes in the localities which cannot be reached in carriages, but to which prudent lads and lasses may roam on foot or horseback. . . . Our third and uppermost Switzerland supplies the Alpine Club with spots where a human foot has never trod, or where the number of its footprints may be counted. It furnishes peaks ascended only by scientific men and human donkeys.

—Charles Dickens, “Foreign Climbs,” 1865¹

Edward Whymper’s successful ascent of the Matterhorn on his eighth attempt in July 1865 mired the burgeoning sport of mountaineering in an ethical debate. During the descent, on a rather tricky section of mixed ice and rock, a quick slip, one false move, and four men fell thousands of feet, their clothes later found fused to their flesh,

* Department of History and Philosophy, 2-170 Wilson Hall, Montana State University, Bozeman, MT 59717; mreidy@montana.edu.

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¹ Dickens, “Foreign Climbs,” *All the Year Round* 14 (2 September 1865): 135–7.

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with arms and legs missing from their mangled bodies. Three were British, including Charles Hudson, vicar of Killington, the most promising young alpinist of the age, and Lord Francis Douglas, a member of the British landed elite. “Why is the best blood of England to waste itself in scaling hitherto inaccessible peaks,” the *Times* mocked, “in staining the eternal snow, and reaching the unfathomable abyss, never to return?”² The nascent climbing fraternity pleaded with Whymper to respond. The “bitter attacks on the Alpine Club and all mountain climbers,” they feared, had produced the general sentiment that climbing was “morally wrong.”³

Several such attacks came from Charles Dickens. He scoffed at the “salubrious excitement of mountaineering for over-worked men; the proud preeminence of England in manly courage.”⁴ It was a dismal sign of the suffocating state of British society. No wonder, he frothed, that the weary businessman, benumbed lawyer, or bored professor, “if he have a fibre of manhood in him, rejoices in the change, rejoices in the adventure, rejoices (this largely enters into the Englishman’s account) in his power of proving to himself that he is neither effete nor effeminate.”⁵ During a time when working-class bodies were being mangled in London factories in the name of industrial progress, that the inner “fibre” of England’s best and brightest was being mutilated in Swiss crevasses seemed beyond the pale.

Leslie Stephen—literary critic and mountaineering apologist—insisted that climbing was a sport, nothing more, but the raging debate in the public press suggested otherwise. So, why all the fuss? What was at stake? In this essay, I argue that definitions of masculinity were at the bottom of the Matterhorn tragedy. I show how golden-age mountaineers attempted to codify gender, like flora and fauna, by altitude. How this worked and why it worked is part of a fascinating story of alpine heights, of death and self-definition, of guides and gentlemen, and of pioneering alpinists’ ability to use their bodies to define the masculine in what Dickens pejoratively referred to as the third Switzerland.

Dickens’s use of a spatial metaphor of “distinct” zones should come as no surprise. He had a knack for feeling the pulse of his age. His move through the vertical—from civilization to wilderness, from common sense to hubris, and from the feminine to the masculine—mimicked the spatial perspective that had taken hold in the sciences by midcentury. Vertical zonation had become a steady guide to research in the geological, botanical, and zoological sciences. It was a guiding organizational force behind biogeography and early oceanography, atmospheric studies of light and heat, and the Humboldtian sciences of terrestrial magnetism, meteorology, and radiation physics. As scientists began exploring the ocean depths and the upper atmosphere, attempting to fathom the oceanic and aerial realms through technologies such as deep-ocean soundings and hot air balloons, a vertical orientation enabled researchers to answer questions that had previously been beyond their reach.

In the middle decades of the nineteenth century, mountaineers used this same

² As quoted in David Robertson, “Mid-Victorians amongst the Alps,” in *Nature and the Victorian Imagination*, ed. U. C. Knoepfelmacher and G. G. Tennyson (Berkeley and Los Angeles, 1978), 113–36, on 114.

³ Alfred Wills to Edward Whymper, 6 August 1865, and Howel Buxton to Edward Whymper, 9 August 1865, MS 822/35, “Letters Concerning the Matterhorn,” Scott Polar Research Institute, Cambridge, England.

⁴ Dickens, “Hardihood and Foolhardihood,” *All the Year Round* 14 (19 August 1865): 85–7.

⁵ *Ibid.*

guiding principle to advance the study of human physiology. A wide range of cultural forces influenced this new interest in the human body. One was the Darwinian emphasis on the natural mechanisms responsible for how the body worked, including its physical and mental limits. Another was the cultural fascination with the consequences of the laws of thermodynamics, especially the seemingly irreversible deterioration associated with entropy. By reducing the body to a machine, which took in food and expended energy through physical labor, nineteenth-century physiologists could focus on fatigue, that onerous quality responsible for limiting productivity, be it on the factory floor or in the trenches of war.⁶ The quest to determine the limits of the human body in extreme environments was part of a larger pursuit to reduce human physiology to an exact science. Mountaineers were in a propitious position to advance these questions. By placing their own bodies in extreme environments, mid-Victorian alpinists helped spearhead a scientific, field-based approach to high-altitude physiology that flourished after the turn of the century.⁷

A focus on the human body linked Darwinian evolutionary theory and the sport of mountaineering from the very beginnings of alpinism. The first edited volume on climbing, *Peaks, Passes, and Glaciers*, appeared in 1859, the same year as Darwin's *Origin*. The three foundational mountaineering texts in Britain—Tyndall's *Hours of Exercise*, Stephen's *Playground of Europe*, and Whymper's *Scrambles amongst the Alps*—were all published in 1871, the same year as Darwin's *Descent of Man*. Victorian mountaineers were well versed in Darwin's powerful new theory, acutely aware of its implications for morality and the focus it placed on the human body: as an animal, a specimen, and an experimental object.⁸

These foundational mountaineering narratives move consistently upward, physically and metaphorically: from civilization to isolation, from domestication to wilderness, and from the feminine to the masculine. Mountaineering narratives have never been simply about climbing, especially during the mid-Victorian golden age, when the sport was invented and debated.⁹ The mountains provided the perfect physical geography to discuss issues of race, class, nationalism, civilization, modernity, morality, and physical ability.¹⁰ But the most highly charged topic of debate

⁶ Anson Rabinbach, *The Human Motor: Energy, Fatigue, and the Origins of Modernity* (New York, 1990), 4, 63. For the manner in which Victorians used the metaphor of the machine to determine the differences between the sexes, see Cynthia Eagle Russett, *Sexual Science: The Victorian Construction of Womanhood* (Cambridge, Mass., 1989).

⁷ The historiographies of both sport and human physiology place this type of scientific analysis in the late nineteenth and early twentieth centuries, attributing it primarily to the work of French and German physiologists. See, e.g., Richard Holt, *Sport and the British: A Modern History* (Oxford, 1989); Vanessa Heggie, *A History of British Sports Medicine* (Manchester, 2011); John B. West, *High Life: A History of High-Altitude Physiology and Medicine* (Oxford, 1998); John M. Hoberman, *Mortal Engines: The Science of Performance and the Dehumanization of Sport* (New York, 1992); and Rabinbach, *The Human Motor* (cit. n. 6).

⁸ For Tyndall and Stephen, two of the leading evolutionary naturalists of their day, these questions were paramount. See Michael S. Reidy, "Scientific Naturalism on High: The X-Club Sequesters the Alps," in *Victorian Scientific Naturalism: Community, Identity, Continuity*, ed. Gowan Dawson and Bernard Lightman (Chicago, 2014), 55–78; and Reidy, "Cosmic Emotion," *Alpinist Magazine*, Summer 2012, 93–6.

⁹ Susan Schrepfer, *Nature's Altars: Mountains, Gender, and American Environmentalism* (Lawrence, Kans., 2005), 3.

¹⁰ See the recent spate of secondary material covering the history of mountaineering, including Peter H. Hansen, *The Summits of Modern Man: Mountaineering after the Enlightenment* (Cambridge, Mass., 2011); Ann C. Colley, *Victorians in the Mountains: Sinking the Sublime* (Burlington, Vt., 2010); Joseph E. Taylor III, *Pilgrims of the Vertical: Yosemite Rock Climbers and Nature at Risk* (Cambridge,

was gender. Mountains became a preferred site for the cultivation of all that was considered masculine and the expulsion of all that was deemed “effete and effeminate.” The body became the tool, the instrument that contemporaries employed to fight their battles over these contested concepts. Thus, this essay analyzes broad geographical trends in the sciences that Victorians used to divide landscapes into zones in order to underscore the gendered notions that directed pioneering research in high-altitude physiology.

WHY CLIMB?

The people beneath our feet inhabit a different world. They don't belong to us, nor we to them. We have risen above the latitudes where battles are fought and crowns are lost; we breathe a purer ether and serener air; and, like the gods from Olympus, look down complacently upon the races of men who make haste to destruction.

—Member of the Alpine Club, 1873¹¹

Three climbers, in particular, structured the narrative of mountaineering in the mid-Victorian era. Edward Whymper towered over the sport, much like the mountain with which he will forever be associated. His rival on the Matterhorn, John Tyndall, infused the sport with science, scaling the mighty Weissshorn in 1861. And Leslie Stephen turned the Alps into a playground, especially for British agnostics. They were the elite of the climbing community. Whymper's *Scrambles*, Tyndall's *Hours*, and Stephen's *Playground* helped define the culture of climbing in Europe.¹² One might assume these adventuresome texts to be filled with hairbreadth (and harebrained) escapes and dangerous fights to the death with the horror of the heights. Literary scholar Francis O'Gorman, for instance, pinpoints the masculinity in both Stephen's and Tyndall's work primarily in their “bravery in facing the physical dangers of the mountains.”¹³ Historian of science Bruce Hevly likewise argues that scientists established authority primarily through the “physical discomfort, if not immediate danger” they experienced as they climbed.¹⁴

Yet the Matterhorn disaster produced an outpouring of anger, encouraging all three alpinists to downplay the dangers of climbing in their publications. “Our great climbers are really getting modest,” one reviewer quipped. “For some reason or other it is becoming the fashion to represent one's own performances in the gross with a tone of gentle disparagement.”¹⁵ The lack of brag and bravado smelled of a conspiracy,

Mass., 2010); and Maurice Isserman and Stewart Weaver, *Fallen Giants: A History of Himalayan Mountaineering from the Age of Empire to the Age of Extremes* (New Haven, Conn., 2008).

¹¹ “The Doctor Abroad,” *Blackwood's Edinburgh Magazine* 113 (1873): 657–77, on 664.

¹² See, e.g., Claire-Elaine Engel, *A History of Mountaineering in the Alps* (London, 1977); James Ramsey Ullman, *The Age of Mountaineering* (Philadelphia, 1964); and, for a popular account, Fergus Fleming, *Killing Dragons: The Conquest of the Alps* (New York, 2000).

¹³ Francis O'Gorman, “The Mightiest Evangel of the Alpine Club: Masculinity and Agnosticism in the Alpine Writing of John Tyndall,” in *Masculinity and Spirituality in Victorian Culture*, ed. Andrew Bradstock, Sean Gill, Anne Hogan, and Sue Morgan (New York, 2000), 134–48, on 135.

¹⁴ Bruce Hevly, “The Heroic Science of Glacier Motion,” *Osiris* 11 (1996): 66–86, on 66, 84. For a nuanced discussion of Victorian mountaineering and risk, see R. D. Eaton, “In the ‘World of Death and Beauty’: Risk, Control and John Tyndall as Alpinist,” *Vict. Lit. Cult.* 41 (2013): 55–73.

¹⁵ “Hours of Scrambling Exercise—Tyndall and Whymper,” *Saturday Review of Politics, Literature, Science and Art* 32 (1871): 59–60, on 59.

another reviewer noted, as alpinists “gloss over the dangers of mountaineering and give the fiercest Alps a quiet, comfortable character, — in fact, to warrant them one and all to carry a lady if required.”¹⁶

Whymper, Tyndall, and Stephen all attained hero-like status among mountaineers for their passionate defense of climbing in ways other than dallying with danger. Danger was certainly involved, but they spoke of this in terms of a benign struggle with nature that ultimately benefited their bodies. Climbing was safe if one took precautions, hired a trustworthy guide, and knew one’s natural limits. Then, it provided an “education in bravery, in self-collectedness, in self control, and in the power of acting in sudden emergencies.”¹⁷ The sport exemplified the Victorian fascination with the assertion of physical and mental control of one’s own body.

Victorian mountaineers also spoke of their yearning to escape the monotony and drudgery of a mundane, urbanized existence, fearing that increased cultivation had eroded a healthy mental and physical equilibrium.¹⁸ Tyndall said he climbed to “restore that balance between mind and body which the purely intellectual discipline of London is calculated to destroy.”¹⁹ For Stephen, the mountains offered “strong stimulants” to reinvigorate his “sluggish imagination.”²⁰ The mountains represented a liminal space blending mind and body, a vertical arena where imaginations could be rejuvenated by the body being pressed to its physical limits. This could not be accomplished in the flat, sullied streets of London. It required a flight to the heights. As one critic rather curiously put it in the *Westminster Review* in 1864, “We must rise now and then, like the whales, to a purer medium.”²¹ This purer medium enabled mountaineers to break down distinctions between physical and intellectual labor, to stress their mental motivations while experiencing hearty, physical activity.

But most of all—and like Dickens, I must stress that this theme appeared throughout British accounts—mountaineers spoke of the manly nature of climbing, of ridding the bored Englishmen of everything that was “effeminate and effete.” These mountaineers drew upon well-established models of masculinity circulating at the time in novels and weeklies, from the books of Charles Kingsley and Thomas Hughes to the heated discussions of women’s education in the *Times*.²² Alpinists believed that they were in a good position to advance this discourse, to approach questions of gender from a privileged position on high. One reviewer noted that each author had his merits—Stephen his buoyancy, Tyndall his imagination, and Whymper his artistic excellence. “But they agree in one virtue, that of manliness.”²³

Physical and mental qualities attained through climbing were always conflated with questions of manliness and the male body. “To attain the perfect balance of body required for difficult glacier and rock work,” one commentator noted, “brings one

¹⁶ “The Alps; or, Sketches of Life and Nature in the Mountains,” *Brit. Quart. Rev.*, July 1862, 71–102, on 98–9.

¹⁷ “Switzerland in Summer and Autumn. Part I,” *Blackwood’s Edinburgh Magazine* 98 (1865): 323–45, on 344.

¹⁸ Robert Nye, *Masculinity and Male Codes of Honor in Modern France* (Oxford, 1993); Taylor, *Pilgrims of the Vertical* (cit. n. 10).

¹⁹ John Tyndall, *Mountaineering in 1861* (London, 1862), vi.

²⁰ Leslie Stephen, *Playground of Europe* (London, 1871), 180.

²¹ “Mountaineering,” *Westminster Rev.*, October 1864, 276–90, on 279.

²² Charles Kingsley, *Two Years Ago: A Novel* (1857); Thomas Hughes, *Tom Brown’s Schooldays* (1857); and Hughes, *Tom Brown at Oxford* (1861).

²³ “Hours of Scrambling Exercise” (cit. n. 15), 59–60.

very near, at least, to the perfection of physical manhood.”²⁴ Another argued that the “qualities of manhood” were all refined through the physical exertions required on steep cliffs: “a reasonable disregard of pain and of life, that insensibility to physical privation, that lightning readiness of hand and eye, that dogged temper of endurance which men have called manliness ever since the days of the Trojan war.”²⁵ Mountains provided Tyndall with a laboratory for his scientific research, the perfect backdrop for his lack of faith, and an outlet for his agnosticism, but most importantly, he stressed, “they have made me feel in all my fibres the blessedness of perfect manhood.”²⁶ In the mountains, physical privation and mental acuity were rarely disassociated from questions of gender.

ESTABLISHING GENDERED ALTITUDINAL ZONES

Between the tropic or table d’hôte zone, inhabited by elderly papas, and the glacial regions devoted to the chamois and to climbers who can equal or surpass the chamois, comes the temperate or middle-aged and ladylike zone of mountaineering.

—“Mountaineering,” *Saturday Review*, 1862²⁷

There is nothing inherently masculine about either mountains or the sport of mountaineering. Historically, mountains were the province of the gods, a place to experience ghastriness or to contemplate the sublime, none of which had ever been strictly codified as masculine in character. Women could see godliness in the mountains, could fear them or see the sublime in them, or even want to conquer them.²⁸ In fact, the mountaineering narratives of 1871 were as popular among women as men, as were the debates about the merits of climbing.²⁹ Women, it seems, were banished from the heights primarily in Britain. As historian Susan Schrepfer demonstrates, a group of New England women founded the first mountaineering club in the United States in 1863, and few subsequent clubs in the United States, New Zealand, or Canada were exclusively male.³⁰ Women routinely undertook serious alpine excursions, often attaining the summit first.³¹

Even in Britain, as climbing grew in popularity, it became increasingly difficult to sustain the process of gendering the sport masculine.³² Women climbers, including Lucy Walker and Marguerite Claudia “Meta” Brevoort, the aunt of William Coolidge, were celebrated climbers in their own right.³³ In 1871, Walker became the first

²⁴ “Switzerland” (cit. n. 17), 343.

²⁵ “Mountaineering” (cit. n. 21), 281.

²⁶ As quoted in “A Scientific Climber,” *Critic* 24 (April 1862): 413–5, on 414.

²⁷ “Mountaineering,” *Saturday Review of Politics, Literature, Science and Art* 13 (1862): 627–8.

²⁸ Ruth Oldenziel, *Making Technology Masculine: Men, Women and Modern Machines in America 1870–1945* (Amsterdam, 1999), 10.

²⁹ Schrepfer, *Nature’s Altars* (cit. n. 9), 13. This is similar to the Arctic exploration narratives discussed in Michael Robinson’s essay, “Manliness and Exploration: The Discovery of the North Pole,” in this volume.

³⁰ Schrepfer, *Nature’s Altars* (cit. n. 9), 69. Women were not allowed as members of the British Alpine Club until 1976.

³¹ *Ibid.*, 72.

³² “Mountaineering,” *London Review of Politics, Society, Literature, Art, and Science* 109 (1862): 98–9.

³³ Rebecca A. Brown, *Women on High: Pioneers of Mountaineering* (Boston, 2002); Colley, *Victorians* (cit. n. 10), 133.

woman to summit the Matterhorn. That same year, Brevoort climbed the Weisshorn, a mountain that had overpowered both Tyndall and Stephen on their first attempts, and which Tyndall had finally summited only a decade earlier. Women climbers, moreover, exhibited all the qualities of their male counterparts, good and bad: they were competitive, self-aggrandizing, self-promoting, and they cared about when they got to the summit and where they would fit in mountaineering history. And they were obviously great athletes. Climbing the Weisshorn or the Matterhorn is no easy feat. As literary scholar Ann Colley has recently pointed out, the sheer number of women mountaineers by the last decades of the nineteenth century suggests that all did not share the idea of an exclusively male domain. Yet, though women were not “summarily discouraged” from climbing,³⁴ gender still operated as a primary means by which Tyndall, Stephen, Whymper, and members of the all-male Alpine Club codified the mountain landscape.

Just as men erected barriers against women entering the labor market or gaining access to education and the professions, so too did a parallel process of spatial boundary making occur in the mountains. Because women were regularly climbing to high altitude, members of the male climbing fraternity focused more diligently on finding zones where women and lesser men could be excluded. Similar to the boundary-making processes seen in the essays by Nathan Ensmenger, Erika Lorraine Milam, and Alexandra Rutherford in this volume, male alpinists attempted to invent an all-male upper zone that could be distinguished from the supposedly demasculinized glaciers and valleys.³⁵ The Alps, especially its glaciers, were becoming uncomfortably accessible, prompting the famous British mountaineer, Alfred Mummery, to describe the history of every mountain in Switzerland in three stages: “An Inaccessible Peak.—The most difficult ascent in the Alps—An easy day for a lady.”³⁶ It is useful here to note that the masculinization of the higher realms took place at exactly the same time as the masculinization of technology, and for similar reasons.³⁷ Just as machines became the measure of men, so too could the ability to reach high altitudes (and latitudes) be used to measure masculinity.

Thus, not all mountain regions were gendered masculine. Titles of texts from the period also included references to a “temperate zone” that was “ladylike.” Compare, for instance, Charles Hudson and Edward Kennedy’s *Where There’s a Will There’s a Way: An Ascent of Mont Blanc by a New Route*, with Mrs. Freshfield’s *Alpine Byways or Light Leaves Gathered in 1859 and 1860*, or contrast Alfred Wills’s *The High Alps* with Mrs. Cole’s *A Lady’s Tour Round Monte Rosa*. Or, if we simply study the iconic paintings and photographs of the era, we find scenes of summits highlighting males in the act of climbing (fig. 1) while pictures of glaciers feature women in skirts in the act of walking.

Duplicating similar moves in the counting-houses and colleges of London, women began to rebel against what they rightfully perceived as a repression of their physical

³⁴ Colley, *Victorians* (cit. n. 10), 5.

³⁵ Nathan Ensmenger, “‘Beards, Sandals, and Other Signs of Rugged Individualism’: Masculine Culture within the Computing Professions,” Erika Lorraine Milam, “Men in Groups: Anthropology and Aggression, 1965–84,” and Alexandra Rutherford, “Maintaining Masculinity in Mid-Twentieth-Century American Psychology: Edwin Boring, Scientific Eminence, and the ‘Woman Problem,’” all in this volume.

³⁶ As quoted in “A Happy Mountaineer,” *Bookman* 8 (1895): 85–6, on 85.

³⁷ Oldenziel, *Making Technology Masculine* (cit. n. 28), 11.



Figure 1. The First Ascent of the Matterhorn by Gustave Doré, 1865.

abilities.³⁸ They took to the high peaks. Marie Paradis had climbed Mont Blanc very early, in 1808, but she was a “peasant” from Chamonix and never published her own story. Published accounts stressed how guides literally carried her to the top as she swooned, semiconscious and fearful to the point of hallucination. There was less to mock, however, in the second female ascent. Henriette d’Angeville, a woman of noble rather than peasant birth, summited the peak in 1838 after a decade of planning. She attributed her success primarily to the triumph of her will. “My physical powers were abandoning me,” she recalled near the summit. “I heard without hearing and saw without seeing.”³⁹ The first British woman to scale Mont Blanc represents a similar triumph over both the mountain and established gender roles. Accompanied by her husband, nine guides, and a sixteen-year-old porter, Mrs. Hamilton passed two nights on the ascent, attained the summit, and returned to Chamonix where she joined the celebration, dancing and toasting her guides with sherry.⁴⁰

The most accomplished British women climbers such as Lucy Walker rarely published their accounts of summiting high peaks. The narratives of those who did publish were often confined to the lower regions. One of the earliest and most popular was *A Lady’s Tour Round Monte Rosa*, unsigned, but known to be the work of Mrs. Henry Warwick Cole. Her aim in writing the book, she related, was the hope of inducing others, “especially members of my own sex,” to follow in her footsteps.⁴¹ The narrative is gendered distinctly feminine.⁴² Cole focused on the inns and hotels, the proper feminine dress, the ability to hire mules or donkeys, and whether “recent numbers of the ‘Times’ and ‘Quarterly Review’” were readily accessible.⁴³ She represented the local guides as a lazy lot, selfish, ignorant, often timid, and always drunk. In the climax of the text, Cole walks around the Chamonix valley rather than conquering one of the surrounding peaks. She begins and ends in civilization.

The text posed little threat, as Cole did not challenge the upper male zone. It was a ride on a mule “round” Monte Rosa, not a climb up, so most reviewers treated her book with a wink and a nod. The one negative review mistakenly believed “the bold lady” actually summited the peak. The reviewer castigated Cole for forfeiting the “gentler and more loving characteristics of her kind.” In fact, the reviewer questioned what “kind” she was. “In daring, in physical strength, and in closeness and accuracy of thought she seems as much a man as Semiramis or Lady Macbeth.”⁴⁴ Similarly, in “A Lady’s Ascent of the Breithorn,” published in *Chambers’s Journal* in 1877, an alpinist also described herself as “the hapless object of half a woman.”⁴⁵ The Breithorn is an extremely high but relatively accessible peak overlooking Zermatt. Its accessibility

³⁸ David Rosen, “The Volcano and the Cathedral: Muscular Christianity and the Origins of Primal Manliness,” in *Muscular Christianity: Embodying the Victorian Age*, ed. Donald E. Hall (Cambridge, 1994), 17–44, on 20.

³⁹ As quoted in Hansen, *Summits* (cit. n. 10), 172.

⁴⁰ “A Lady’s Ascent of Mont Blanc,” *Leader* 5 (1854): 845; “A Lady’s Ascent of Mont Blanc,” *Reynold’s Miscellany of Romance, General Literature, Science and Art* 13 (1854): 212.

⁴¹ [Mrs. Henry Warwick Cole], *A Lady’s Tour Round Monte Rosa* (London, 1860), 2.

⁴² For “proper” and “improper” females, see J. B. Bullen, *The Pre-Raphaelite Body: Fear and Desire in Painting, Poetry, and Criticism* (New York, 1998), 166.

⁴³ [Cole], *A Lady’s Tour* (cit. n. 41), 58.

⁴⁴ “Alpine Tours,” *Dublin University Magazine* 54 (1859): 475–86, on 475.

⁴⁵ “A Lady’s Ascent of the Breithorn,” *Chambers’s Journal*, 1877, 535. See also R. A. E., “A Lady’s Ascent of a Snow Mountain,” *Golden Hours: A Monthly Magazine for Family and General Reading* 15 (1882): 441–5, for a description of the ascent of the Cima di Jazi, a lofty snow-covered peak of the Monte Rosa range, reaching 12,500 feet.

lessened its value for mountaineers, and tellingly, it became known as “the Ladies’ Mountain.”⁴⁶

Other climbing narratives written by women seemed to follow a similar course. *Alpine Byways* by “A Lady” appeared in 1861, the same year that Tyndall climbed the Weissshorn. Its frontispiece featured a magnificent woodcut of the mountain, but only as seen from below (fig. 2). In fact, none of the seven illustrations depict icy crags or rocky pinnacles. The “lady” seemed to know her place. However, “without aspiring to exploits which may be deemed unfeminine,” the author explained that the pursuit of “manly amusement” had spread far and wide, “making wives and sisters seek participation in the pleasures which they hear so vividly described.”⁴⁷

The text then subtly undermined the all-male vertical zonation of mountain regions. While always with her husband and young son, she consistently left the “well-known routes” and “(accompanied by a lady friend) sought to extend our acquaintance with the by-ways and higher passes of the Alps.”⁴⁸ While climbing the Schilthorn, she stressed how “there were no defined tracks, and we had to climb up steep, rough rocks . . . affording precarious footholds, where a slip would have had unpleasant consequences.”⁴⁹ At one point, they had to cross a knife-edged ridge, “skirting the snow on one side, while on the other the rocks descended precipitously below us.”⁵⁰ This sounds very much like the accounts given by Whymper, Stephen, and Tyndall. As she ascended ever upward, a decidedly masculine narrative follows, with the crossing of extensive snow-fields embedded with crevasses, snow bridges, the cutting of steps, and the incessant dallying with danger through deep snow to the summit. Her husband was enfeebled by the climb, both on the way up, when his “breathing became oppressed and painful,” and on the way down, when he “sprained his knee and nearly exhausted his powers.”⁵¹

The author took more chances with her second book, *A Summer Tour in the Grisons and Italian Valleys of the Bernina*, published in 1862. Both the Grisons and Bernina Alps had rarely been visited, so the title alone suggested experiences beyond the ordinary. This time, she signed her name, Mrs. Henry Freshfield, to the title page and acknowledged her authorship of *Alpine Byways*. From the beginning, she consciously focused on heights and included a table of “Mountain Heights in English Feet.”⁵² Following a common trope of alpine narratives, she began by comparing most travelers to sheep, never wandering from the beaten path. She then asked the reader to follow her as she broke new trails, scrambled across knife-edge ridges, glissaded down snow-fields, and climbed “high above the glacier.”⁵³ In her first book, her husband often had trouble following her on the mountain; in this bolder text, he is purposefully and unceremoniously left behind at the hotel.

⁴⁶ See Annie S. Pec, “A Woman’s Ascent of the Matterhorn,” *English Illustrated Magazine* 157 (1896): 53–62, on 56. This language still prevails. Today, most climbing areas have “girlfriend friendly routes,” usually the warm-up climb. The irony, of course, is that some of the greatest climbers today are female, including the greatest rock climber of my generation, Lynn Hill, the first to free climb “The Nose” on El Capitan in Yosemite National Park, as well as the first to free climb it in a day.

⁴⁷ A Lady, *Alpine Byways, or Light Leaves Gathered in 1859 and 1860* (London 1861), 2.

⁴⁸ Ibid. Her son, Douglas Freshfield, became a world-renowned climber, the first to open up the Caucasus to climbing, one of the first to visit Kanchenjunga, and a future president of the Alpine Club.

⁴⁹ Ibid., 10.

⁵⁰ Ibid., 12.

⁵¹ Ibid., 28, 32.

⁵² Mrs. Henry Freshfield, *A Summer Tour in the Grisons and Italian Valleys of the Bernina* (London, 1862).

⁵³ Ibid., 102.



Figure 2. The Weisshorn from above Ronda (from a drawing by Edward Whymper). From [Mrs. Henry Freshfield], Alpine Byways (cit. n. 47), frontispiece.

Mrs. Freshfield's mountaineering texts predated the narratives of Stephen, Tyndall, and Whymper, who focused exclusively on the heights, insisted on the courage and trustworthiness of guides, and defined their own regions as the place where the *Times* could never be found. They realized the boundary they were attempting to create was much more porous than they liked to admit. The higher Mrs. Freshfield climbed, the higher their exclusive zone needed to be. Most of all, they required a boundary-making instrument. For this, they turned to their bodies, and when that proved insufficient, they co-opted the bodies of their guides, the real natives of the third Switzerland.

THE BODY AND THE GUIDE

The mountaineers as a rule seem to think that their consumption and assimilation of food is a subject of very general interest, not only to themselves, but to the public. If there could be removed from the various Alpine chronicles all that bears upon breakfasts and suppers, the sustaining character of concentrated meat, the vicious consequences of excess in bread and milk, the use and abuse of cold tea, and the invigorating properties of chocolate, there would vanish all that lends glow, so to speak, and substance to a considerable number of narratives.

—"Guides or No Guides," *Saturday Review*, 1870⁵⁴

Whymper, Stephen, and Tyndall focused incessantly on their own bodies: their physical health, the amount they could walk, the fitness of their stomachs, and especially on everything that they ate. Tyndall's solo ascent of Monte Rosa, the first time the mountain had been climbed alone and without a guide, is representative of other narratives of high-altitude climbing in its focus not on where he went, but on what he ingested. He commented on the "cowardly and apathetic" nature for the need of "incessant 'refreshing'" found in more touristy narratives, and then related what he ate at each and every point. He had "neither brandy nor wine," merely "four ounces of bread and ham."⁵⁵ Near the summit, "I had eaten nothing. I had two mouthfuls of sandwich and nearly the whole of the tea that remained."⁵⁶ To lighten his load, he left the rest of the sandwich behind. We know little about the route he took, but we know, practically to the ounce, what he ate the entire day.

Tyndall was religious about what he consumed. As one commentator noted, he viewed "physical existence as the mystic substratus of men's moral nature" and was particularly fixated on eating wholesome food. "The self-same atmosphere forced through one instrument produces music; through another noise," Tyndall thought, "and thus the spirit of life, acting through the human organism, is rendered demoniac or angelic by the health or the disease which originate in what we eat."⁵⁷ More to the point, Tyndall's caloric intake was repeated in almost every review of his climbing accomplishments. "It is not every man" noted one commentator, "who can, like Professor Tyndall, climb the Weisshorn on a box of meat lozenges, and Monte Rosa on a couple of ham sandwiches."⁵⁸ On the Monte Rosa, noted the *Athenaeum*, Tyndall

⁵⁴ "Guides or No Guides in the Swiss Mountains?" *Saturday Review of Politics, Literature, Science and Art* 29 (1870): 681–2, on 681.

⁵⁵ John Tyndall, *The Glaciers of the Alps* (London, 1861), 151.

⁵⁶ *Ibid.*, 155.

⁵⁷ As quoted in "A Scientific Climber" (cit. n. 26), 413.

⁵⁸ "Mountaineering in 1861: A Vacation Tour," *Athenaeum*, no. 1801 (1862): 589–91.

persevered “without a guide, without a coat, and without a neckcloth, provided only with a small bottle of tea and a ham sandwich.”⁵⁹ If Tyndall and others didn’t speak of food, reviewers superadded it to the account of the alpinists’ own narratives, underscoring bodily exertion, the need for sustenance, and the health of the body.⁶⁰ As historian of sport Richard Holt put it, “The Victorians were much preoccupied with matters of health.”⁶¹

The focus on food enabled Tyndall and others to demonstrate their physical endurance under extreme privation, directing the focus specifically on the body itself.⁶² As Cynthia Eagle Russett has shown, “the idea that great thinkers are hearty eaters” also enabled the Victorians to equate a healthy body with a healthy mind, the one leading to the other.⁶³ The self-discipline required to deny bodily wants was also the key to both intellectual and physical control. They did not distinguish between the rigorous self-discipline needed to conquer peaks and the same manly discipline displayed by “truth-seekers” in their quest for intellectual or spiritual attainment.⁶⁴ Tyndall, Stephen, and Whymper all dwelled on the physicality involved in climbing in the higher regions of the Alps, the simian contortions of their movements, and the resulting inscriptions produced on their flesh. “Blood shot eyes, burnt cheeks, and blistered lips,” Tyndall recounted, “are the results of the journey.”⁶⁵

A focus on the male body was a defining aspect of the cultural milieu of “muscular Christianity,” the unification of physical strength and evangelicalism that became so widespread in the second half of the nineteenth century. It was Charles Kingsley, argues historian James Eli Adams, who “placed the male body into widespread circulation as an object of celebration and desire.”⁶⁶ Though muscular Christianity exerted a profound influence on Victorian mountaineers, it is actually a rather strange moniker. First, following the work of Rousseau, Humboldt, de Saussure, and others, many Victorian alpinists viewed the high Alps in decidedly secular terms. Stephen and Tyndall were among the most outspoken agnostics of their day, their views formulated in the early 1860s, at the height of their climbing careers.⁶⁷ High Alpine environments provided the ideal backdrop to establish their new creed and to prove through physical exertion what they popularized in print.

Second, Tyndall, Stephen, and Whymper were not muscular. They all had a similar physique: tall and slender, certainly tough, but more wiry than strong. Tyndall spoke of the “fibres” of his frame, a tenacity that he portrayed as more moral than physical.⁶⁸

⁵⁹ “Our Weekly Gossip,” *Athenaeum*, no. 1719 (1860): 453–4.

⁶⁰ See, e.g., “The Alps” (cit. n. 16), 91.

⁶¹ Holt, *Sport* (cit. n. 7), 87.

⁶² Like a host of other students at Cambridge, Stephen mingled athleticism and intellectual study. For the close connection between athletics and the Mathematical Tripos Exams, see Andrew Warwick, “Exercising the Student Body: Mathematics and Athleticism in Victorian Cambridge,” in *Science Incarnate: Historical Embodiments of Natural Knowledge*, ed. Christopher Lawrence and Steven Shapin (Chicago, 1998), 288–323.

⁶³ Russett, *Sexual Science* (cit. n. 6), 104–5.

⁶⁴ Stephen Shapin, “The Philosopher and the Chicken: On the Dietetics of Disembodied Knowledge,” in Lawrence and Shapin, *Science Incarnate* (cit. n. 62), 21–50.

⁶⁵ John Tyndall, *Journals*, 25 August 1861, JT.2.13c, Royal Institution of Great Britain, London, England (hereafter cited as RI).

⁶⁶ James Eli Adams, *Dandies and Desert Saints: Styles of Victorian Masculinity* (Ithaca, N.Y., 1995), 150.

⁶⁷ Reidy, “Scientific Naturalism” (cit. n. 8).

⁶⁸ As quoted in “A Scientific Climber” (cit. n. 26), 413.

Stephen was often described as striding “from peak to peak like a pair of compasses.”⁶⁹ With their tall, lanky frames, physically diminished from lack of food and physical exertion, they looked more like Christ on the Cross than an athlete on the rugby field. And they had the ascetic control to prove it. Through temperament and training, they limited their bodily needs and desires. Their accounts echo a precious narrative of Western culture: the suffering, death, and rebirth of Christ. Christ’s body—its actual physical form—his suffering and eventual resurrection, dominated thinking at the time,⁷⁰ and mountaineering narratives recapitulated the same narrative. Alpinists also suffered. They too died on their way to the summit, often one toe or finger at a time. And, in the end, they too were resurrected—physically, emotionally, and spiritually. The mountain life was an ascetic life, and like Christ bearing a burden for humanity, suffering physically on the cross for our sins, so too did climbing inscribe suffering directly on the bodies of climbers.⁷¹

So, if the elite mountaineers were thin and wiry, where were the muscles to be found? The answer leads us to Dickens’s “human donkeys,” the bodies in the mountains that actually did all the work, the brawn connected to the brain. Stephen was explicit about this point: “It is the guide who precedes the rest of his party, cuts out the steps, supports the exhausted, and carries the provisions; while the traveller only carries himself and his brandy flask.”⁷² Stephen idolized Ulrich Lauener and Melchior Anderegg, his guides of many years (fig. 3). He described Lauener as “square-shouldered,” “gigantic,” “the most picturesque of guides,” and “the very model of a true mountaineer.” Tyndall, likewise, described his guide, Joseph Johann Bennen, as giving the “impression of great strength and great decision.” Other guides are “not so strong as Bennen; and Bennen knows no fear: what man can accomplish he will do.”⁷³

The guides were not discussed ambivalently, as we might expect. They were not invisible, making up the “silent majority who never made it into the world of documents.”⁷⁴ They were always named—Christian Kaufmann, Johann Auer, Eduard Balmat, Anderegg, Lauener, Bennen, Jean Antoine Carrel. They were present because their bodies made them so.

In some respects, the guides were obviously subordinate to their employers. Their bodies were objectified commodities belonging to the climber, an ownership that was functionally hierarchical.⁷⁵ They were paid for their services, and they climbed at the behest of their employer. The amateur planned the entire climb, directed it, decided

⁶⁹ Frederic William Maitland, *The Life and Letters of Leslie Stephen* (London, 1906), 143.

⁷⁰ Norman Vance, *Sinews of the Spirit: The Ideal of Christian Manliness in Victorian Literature and Religious Thought* (New York, 1985), 6.

⁷¹ Stephen D. Moore, *God’s Gym: Divine Male Bodies of the Bible* (New York, 1996), 81; Adams, *Dandies* (cit. n. 66), 4–16.

⁷² As quoted in “The Playground of Europe,” *Chambers’s Journal*, issue 384 (1871): 276–80.

⁷³ Tyndall went on to write of Bennen, “He is proud of his calling and will show no danger. He is conscientious, and depend upon it, if you lose your life in his company he will lose his in yours, for he will die to save the man he leads.” John Tyndall to Heinrich Debus, 4 August 1858, Tyndall Correspondence, RI. Tyndall was unfortunately correct. Bennen died leading three British amateurs up the Haut de Cry in 1864.

⁷⁴ Nicholas Jardine and Emma Spary, “The Natures of Cultural History,” in *Cultures of Natural History*, ed. N. Jardine, J. A. Secord, and E. C. Spary (Cambridge, 1996), 3–13, on 9.

⁷⁵ Donald E. Hall, “On the Making and Unmaking of Monsters: Christian Socialism, Muscular Christianity, and the Metaphorization of Class Conflict,” in Hall, *Muscular Christianity* (cit. n. 38), 45–65, on 50.



Figure 3. Leslie Stephen with his longtime guide, Melchior Anderegg, circa 1870.

where they should go and when they ought to turn back. But this was true only to a point. Verticality reigned supreme here as well, dictating the power relationship between a guide and “his” amateur. The guide led the party. It was his decision that constrained the choices of the amateur, defining where they could go and when they had to turn back. Up to a certain height, the guide was at the behest of the amateur.

Past that point, the amateur was at the behest of the guide. The decision-making and power structure was thus mapped onto a vertical scale. Although the “amateur” was referred to as “Herr,” which retained a class distinction, the guides were the *Bergführers*, or mountain masters.⁷⁶

The relationship that middle-class Victorian alpinists had with their working-class guides is fascinating in its complexity. Everything strikes a historian’s ears as slightly amiss, partly because the class distinctions that were so apparent in other venues were lessened in the high Alps. The mountain ascent became one of the few places where men could transcend class divisions, at least rhetorically, erasing the social stratification between worker and gentleman.⁷⁷ One of the peculiar merits of mountaineering, one commentator noted, was the “human fellowship” that it provided between different classes of companions. Gentlemen usually interact with their “laboring fellow men” only in artificial circumstances, making true brotherhood impossible. “Men of education and of wealth meet their toiling brothers only as employers, as rulers, as teachers,—never, by the nature of things, as friends.” Yet, the mountain environment changed all of that, for reasons that were clear enough: “Conventional reserve, however thickly coated, shrivels off from men who owe each other their lives several times a day.”⁷⁸ With the creation of climbing came the advent of climbing partners, and a bond formed between men irrespective of social class or education. Then and now, this is reverently referred to as a “fellowship of the rope.”⁷⁹

As Dennis W. Allen has argued with respect to Charles Kingsley and others, “the emphasis on physical vigor in muscular Christianity is also an act of co-optation, the ideological annexation by the middle classes of the body itself, which had formerly been associated with the working classes.”⁸⁰ In the high Alps, the guide’s body literally became an extension of the climber, and its qualities—paid for by the British amateur—an extension of middle-class British masculinity. Physically tethered by a rope, their fellowship united their bodies into one form, with the same fate and the same destiny, be it triumph or defeat, courage or weakness.

Though the relationship between guides and amateurs often blurred common distinctions of class and authority, it actually helped solidify contemporary notions of masculinity. The metaphorical figure of Christ that some saw in the bodies of the British amateur, when combined with the muscular bodies and physical strength of

⁷⁶ For insightful discussions of the relationship between Victorian mountaineers and their guides, see Hansen, *Summits* (cit. n. 10); Eaton, “In the ‘World of Death and Beauty’” (cit. n. 14), 64–73; and Helen Blackman, “A Spiritual Leader? Cambridge Zoology, Mountaineering, and the Death of F. M. Balfour,” *Stud. Hist. Phil. Biol. Biomed. Sci.* 35 (2004): 93–117. In the use of “*Bergführers*,” note the patriarchy implied. There were women climbers but no women guides. The same phrasing was at work with the introduction of the “master mechanic” in the 1880s. See Oldenzel, *Making Technology Masculine* (cit. n. 28), 108.

⁷⁷ As “H” wrote in the *Alpine Journal*, “Dangers and difficulties shared, and the exchange of thoughts and opinions . . . wonderfully diminish, for the time, at least, the gulf that exists, socially, between them while the courage, presence of mind, endurance and unselfishness which is so often displayed on behalf of the traveller, makes him feel that his advantages of birth and education do not weigh so very heavily against native worth.” “Letter to Editor,” *Alpine Journal* 44 (1863–4): 132.

⁷⁸ “Mountaineering” (cit. n. 21), 285.

⁷⁹ There is also a complicated connection between the creation of a muscular Christian fellowship in the mountains, and the rugged, cross-class brotherhood formed in socialist circles in the nineteenth century. See esp. Hansen, *Summits* (cit. n. 10); and Sheila Rowbotham, *Edward Carpenter: A Life of Liberty and Love* (London, 2009).

⁸⁰ Dennis W. Allen, “Young England: Muscular Christianity and the Politics of the Body in ‘Tom Brown’s Schooldays,’” in Hall, *Muscular Christianity* (cit. n. 38), 114–32, on 128.

the guides, offered a means of uniting seemingly disparate forms of manhood, the ascetic and the muscular, that in himself the middle-class amateur often lacked. By co-opting the guide's body in this way, the Victorian mountaineer could combine the elements of both working-class and middle-class masculinity, mixing autonomy, skill, and physical strength with judgment, restraint, and mental prowess, a swaggering masculinity with a respectable one.⁸¹ The mountains are thus a fruitful place to look for the transition from early Victorian conceptualizations of masculinity, based on ascetic self-discipline and moral strength of conduct, to the late Victorian rhetoric of courage, bodily exertion, and physical strength.⁸²

WHYMPER AND THE PHYSIOLOGY OF MASCULINITY

As water finds its own level, so does the Alpine tourist, after a short experience, know his own range on the Alpine scale. A little training may enable him to reach the extreme limits of that range. . . . But the range itself is fixed by tastes and habits as well as physical powers.

—*Saturday Review*, 1862⁸³

Mountaineers brought seemingly contradictory visions of masculinity together in the mountains, the muscular and the ascetic, the working and the genteel. Their focus on their own bodies and those of their guides also enabled them to tease out the differing physical and mental capacities of men and women, imparting scientific validity to the all-male vertical zone. The problem for women—and the advantage for men—could be found in the body.

The transition from identifying the masculine in the male's mind to situating it in the body, from the moral to the physical, is a dominant theme in the mountaineering literature of the mid-nineteenth century. Thus, in addition to the domestic manliness outlined by historian John Tosh, where the "Victorian codes of manliness made scant acknowledgement of the body,"⁸⁴ we also see the creation of a rugged, outdoor manliness that focused on the body itself. The high alpine environment provided an ideal geography to discuss, debate, and ultimately define the physiology of the male body and the characteristics that might flow from it.⁸⁵ Where a climber's body could go was not simply a matter of physical training or mental preparedness. The range was fixed by nature, like water finding its level.

Edward Whymper was obsessed with finding just that fixed limit. All mountaineers know his *Scrambles amongst the Alps*, perhaps the seminal text in the history of mountaineering. It contains chapter after chapter of exciting explorations in the heart of the Swiss heights, climaxing with a firsthand recounting of the Matterhorn tragedy. Few today, however, read his *Travels amongst the Great Andes of the Equator*, even though it contains an account of the first European to climb in the Andes to over

⁸¹ Stephen Meyer, "Work, Play, and Power: Masculine Culture on the Automotive Shop Floor, 1930–1960," in *Boys and Their Toys? Masculinity, Technology and Class in America*, ed. Roger Horowitz (New York, 2001), 13–32.

⁸² Adams, *Dandies* (cit. n. 66), 230, though Adams does not discuss mountaineering.

⁸³ "Mountaineering" (cit. n. 27), 627–8.

⁸⁴ John Tosh, "What Should Historians Do with Masculinity? Reflections on Nineteenth-Century Britain," *Hist. Workshop J.* 38 (1994): 179–202, on 182.

⁸⁵ *Ibid.*, 180. Tosh acknowledges this point as well, noting how the Imperial Service enabled Victorian young men to move beyond the domestic sphere and thus domestic masculinity.

20,000 feet, the first to spend the night on Cotopaxi, and the first to climb Chimborazo (not once but twice, by two different routes).⁸⁶ Alpinists don't read it today because it's not really a mountaineering narrative; it is primarily a contribution to high-altitude physiology. That is certainly how Whymper's contemporaries viewed his work.⁸⁷

Whymper focused incessantly on his own body. His stamina was the stuff of legends. He often walked thirty-five miles in a day, including twenty-seven miles non-stop during a walk from Edinburgh to London. He had his pedestrianism down to a science, calculating his pace at about eleven minutes per mile.⁸⁸ In 1865, the year of the Matterhorn tragedy, he calculated that he had climbed over 100,000 vertical feet in eighteen days.⁸⁹ He transformed his walking prowess into both climbing proficiency and scientific achievement. His focus on his own body propelled him to a unique, if largely forgotten, place in the history of physiology.

Whymper had long dreamed of making a name for himself through science and exploration, eventually making two exploratory voyages to Greenland in 1867 and 1872, to the glaciers of South America in the mid-1880s, and to the Rocky Mountains in the early 1900s. His love for mountains began in the Swiss Alps in the 1860s, a result of his training as an engraver. William Longman sent him to the mountains to make woodcuts for the first edited volume on climbing, *Peaks, Passes, and Glaciers*, and Whymper became entranced by high-altitude environments. The Matterhorn seemed to control him like a spell. He made numerous attempts on the mountain, all from the Italian side, before successfully climbing the Hornli Ridge from Switzerland. "There seemed to be a cordon drawn around it," he said of the deadly mountain, "up to which one might go, but no further."⁹⁰

After the solemn events of 1865, Whymper turned his attention to defining the actual physical cordons that limited human movement in the high altitudes. His work fit into a larger contemporary cultural fascination with how the human body worked, a nascent scientific approach to understanding the body's natural limits.⁹¹ By searching for the limits of the human body, he helped spearhead a scientific, field-based approach to high-altitude physiology that would flourish only after the turn of the twentieth century.

The limits of the human body in extreme environments, especially the sickness brought on by high altitude, had become a popular topic among researchers, particularly on the Continent. The symptoms of mountain sickness seemed to correspond almost perfectly to the presumed physiology of the "effete and effeminate," suggesting a topic of study that could highlight the inner workings of the human body and thus a useful means for distinguishing scientifically between males and females. Scientists

⁸⁶ Indeed, it contains the first ascent of some of the world's greatest mountains, including Chimborazo (20,564 ft.), Cayambe (18,996 ft.), Antisana (18,714 ft.), Carihuairazo (16,750 ft.), Sincholagua (16,360 ft.), Cotacachi (16,290 ft.)—all higher than the highest mountain in Europe.

⁸⁷ See the numerous reviews of the text in all the major journals of the day, including, e.g., "Travels amongst the Great Andes," *Athenaeum*, no. 3366 (30 April 1892): 557–8; "The Andes of the Equator," *All the Year Round* 7 (21 May 1892): 486–92; and "On the Great Andes; Or Life at Low Pressure," *Chambers's Journal of Popular Literature, Science and Arts* 9 (28 May 1892): 343–5. And see the reviews in the scientific literature of the day, such as "Mountain Sickness," *Brit. Med. J.*, 16 April 1895, 829.

⁸⁸ Edward Whymper, *Travels amongst the Great Andes of the Equator*, ed. Loren McIntyre (Salt Lake City, 1987), 300.

⁸⁹ Whymper, *Scrambles amongst the Alps* (London, 1871), 352.

⁹⁰ *Ibid.*, 76.

⁹¹ Rabinbach, *The Human Motor* (cit. n. 6), 6.

had studied the body's response to balloon ascents, but they rarely stayed aloft long enough to determine either the causes or effects of altitude sickness, whether exhaustion, lack of nourishment, weather, or temperature mattered, and whether the effects were permanent or temporary. The question, so to speak, was still in the air.

It also had moved into the laboratory. French physiologists were perfecting the hyperbaric chamber, an instrument designed to mimic the high altitudes achieved by mountaineers. The French physiologist Paul Bert constructed numerous chambers in his laboratory in Paris, evacuating them to dangerously low pressures. His first instruments were big enough to house birds, dogs, cats, and rabbits, but he soon advanced to chambers large enough to accommodate humans, including himself, in 1874. Scientific mountaineers were interested in Bert's results but argued that humans could not remain in the chambers long enough to obtain meaningful conclusions. They believed that experiments in the air and laboratory were inconclusive at best and lethal at worst, resulting in more questions than answers.

Whymper believed that the only way to settle such questions was to spend a large amount of time at high altitudes, stationary, where he could perform experiments, obtain measurements, and confirm results. The Alps weren't high enough, maxing out below 16,000 feet. He needed a higher mountain, and he chose the one with the longest, most distinguished history in the sciences. On the bottom slopes of Chimborazo, Alexander von Humboldt had penned his famous "Essay on the Geography of Plants," which laid the foundation for studying the relationship between climate, elevation, and the distribution of species. The mountain had also never been summited. In 1879, along with his two Swiss guides, Jean Antoine Carrel and Louis Carrel, Whymper transformed the Andes into his third Switzerland, Chimborazo into his scientific laboratory, and his own body and those of his guides into his scientific instruments.

Whymper set up his entire *Travels amongst the Great Andes of the Equator* as a set of bodily scientific experiments to determine the physiological limits of the human frame. He began the narrative recounting the several weeks he and the Carrels took to climb the historic peak. It reads like a laboratory report: "I found that my residence upon Chimborazo had extended over seventeen days. One night passed at 14,370, ten more at 16,664, and six others at 17,285, and this is perhaps the greatest length of time that any one has remained continuously at such elevations."⁹² At each stage and throughout each day, he performed physiological experiments on himself and his guides. He checked their pulses, measured their breathing, and jotted notes about their physiological responses. He counted his steps—657 without stopping between 15,000 and 16,000 feet, comparable to what he experienced on Mont Blanc—and he recorded their symptoms as they progressed upward, including his own inability to perform his work and his surprising lack of desire to smoke.⁹³ He also counted the steps required to travel specific distances, again comparing his results with earlier calculations he had made near sea level in London. These and similar experiments foreshadowed later comparative approaches to understanding the effects of high altitude on physical endurance.⁹⁴ He also administered to himself chlorate of potash, a supposed cure for alpine sickness, though Jean Antoine considered it an insult to his

⁹² Whymper, *Travels* (cit. n. 88), 83.

⁹³ As a habitual smoker, Whymper noted, "when persons put aside their beloved pipes there is certainly something wrong." *Ibid.*, 53.

⁹⁴ E. S. Williams, "Exercise and Altitude," *Postgraduate Med. J.* 55 (1979): 492–4, on 492.

intelligence and manliness.⁹⁵ After an exhausting two-day push, they finally made it to the top of the famed peak, “hungry, wet, numbed, and wretched, laden with instruments which could not be used.”⁹⁶

Whymper hoped to stay on the summit of Chimborazo for several days to take physiological measurements, but Jean Antoine had suffered severe frostbite to both of his feet. They were forced to retreat down to Quito and recuperate before attempting to climb the neighboring Cotopaxi, which had a large slope at its summit that Whymper hoped could serve as a laboratory. The narrative focused less on the climb itself up Cotopaxi and more on the twenty-six hours spent on the summit, where Whymper and the Carrels again took bodily measurements.

The narratives of all of the climbs focused heavily on the sciences: glaciers, botany, zoology, the correct use of aneroid barometers, and list after list of insects. The final chapter, however, focused exclusively on mountain sickness: its symptoms, when it hit, at what pressure, how long it lasted, when it died away, how to cure it—by going down!—and its relationship to temperature, breathing, food consumption, sleep, anxiety, and the deterioration of muscles. The mountains were not the object. Whymper’s conclusions were all physiological: “There are strong grounds for believing,” he concluded, “that they [symptoms of mountain sickness] are due to the expansion, under diminution of external pressure, of gaseous matter within the body; which seeks to be liberated, and causes an internal pressure that strongly affects the blood vessels.”⁹⁷ His approach was a direct prefiguration of what historian John M. Hoberman has referred to as the search for an “experimental quantifiable biological phenomenon for otherwise invisible metabolic processes” that became so popular at the end of the nineteenth century.⁹⁸

While the causes of mountain sickness were physiological, so too were its symptoms. And the ailments turned out to be the exact ones the Victorians used to define the absence of manliness: weakness, lack of will, timidity, lassitude, muscle deterioration, slow decision-making ability, and the like. As historian Robert Nye demonstrated in his study of fin de siècle France, questions of masculinity led to interests in its biological sources that were “inseparable from concerns about the strength and endurance of the human body.”⁹⁹ Whymper always had this focus on the body in mind: What can it achieve? What are its limits? He attempted to reduce the frailty of the human body and how and when it succumbed to mountain sickness to quantitative measurement.¹⁰⁰

Whymper’s studies were part of the burgeoning field of high-altitude physiology, a new area of study that relied extensively on self-experimentation, whether in balloons, in hyperbaric chambers, or on the summits of mountains. In both the field and the laboratory, the experimental subjects were always male. High-altitude physiologists beginning with Whymper mapped the vertical gendered relations found in the standard mountaineering narratives directly onto their science.

This linking of the biological basis of human performance with scientific

⁹⁵ As Whymper said of his guide: “For all human ills, for every complaint, from dysentery to want of air, there was, in his opinion, but one remedy; and that was Wine; most efficacious always if taken hot, more especially if a little spice and sugar were added to it.” Whymper, *Travels* (cit. n. 88), 50.

⁹⁶ *Ibid.*, 69.

⁹⁷ *Ibid.*, 374.

⁹⁸ Hoberman, *Mortal Engines* (cit. n. 7), 31.

⁹⁹ Nye, *Masculinity* (cit. n. 18), 222.

¹⁰⁰ Bruce Haley, *The Healthy Body and Victorian Culture* (Cambridge, Mass., 1978); Nye, *Masculinity* (cit. n. 18), 224.

experimentation was not the sole preserve of human physiology. It also found expression in broader cultural trends taking hold within Europe and America in the last quarter of the century, including the rise in popularity of sports more generally. As Hoberman has pointed out, “The cult of the athlete developed along with scientific interests in extreme physiological states.”¹⁰¹ A similar focus on human potential, for example, was part of the revival of the Olympic Games from the very beginning. Baron Pierre de Coubertin, the founder of the modern Olympics, was obsessed with the physical limits of the human body, as was William Henry Grenfell, 1st Baron Desborough, the president of the British Olympic Association, and the person most responsible for bringing the games to London in 1912. Desborough seemed to epitomize the model athlete, uniting “the strength of a Porthos, the heart of an Athos, and the body of an Englishman.”¹⁰² He also summited the Matterhorn three times, the last in conjunction with the Monte Rosa and the Rothorn within eight days.¹⁰³

As one modern critic pointedly noted, the revival of the Olympic Games was nothing more than “a gigantic biological experiment carried out on the human organism.”¹⁰⁴ It should come as no surprise that the gendered notions that constituted high-altitude physiology also found expression in the early Olympics. Just as women and men adapted to different regions, the women to lower environments, the men to the heights, so too were women justifiably confined to specific sports—namely, figure skating and equestrian events.¹⁰⁵ According to reports in the British press, women had never been allowed to participate, and those who did were “hurled down from the neighbouring rock of Typaeum.”¹⁰⁶ Tellingly, Pierre de Coubertin, the “father” of the modern Olympics, reported in 1902 that athletics for women was “against the laws of nature.”¹⁰⁷

CONCLUSION

Travellers, like plants, may be divided according to the zones which they reach. In the highest region, the English climber—an animal whose instincts and peculiarities are pretty well-known—is by far the most abundant genus. Lower down comes a region where he is mixed with a crowd of industrious Germans, and a few sporadic examples of adventurous ladies and determined sight-seers. Below is the luxuriant growth of the domestic tourist in all his amazing and intricate varieties.

—Leslie Stephen, *Playground of Europe*, 1871¹⁰⁸

With the initial founding of the Alpine Club of London, mountaineering seemed poised to become a safe haven for an all-male fraternity where the qualities of masculinity could be safely defined. The alpinists considered themselves special because they had risen above others to blaze new trails. “For a long time the tourists who annually visited the Alps were content to follow in certain beaten tracks,” noted a founding

¹⁰¹ Hoberman, *Mortal Engines* (cit. n. 7), 61.

¹⁰² “The Olympic Games at Shepherd’s Bush: Lord Desborough and His Exploits,” *Review of Reviews* 37 (1908): 375.

¹⁰³ *Ibid.*

¹⁰⁴ As quoted in Hoberman, *Mortal Engines* (cit. n. 7), 4.

¹⁰⁵ Holt, *Sport* (cit. n. 7), 129.

¹⁰⁶ “The Revival of the Olympian Games,” *Cosmopolis* 2 (1896): 59–74, on 66.

¹⁰⁷ As quoted in Holt, *Sport* (cit. n. 7), 129.

¹⁰⁸ Stephen, *Playground* (cit. n. 20), 184.

member of the Alpine Club in 1859, “each one copying with almost servile fidelity the route followed by his predecessors.”¹⁰⁹ The new class of men was proud to break new ground in order to view the world from a unique vantage point. Stephen was the master of this line of argument. He always differentiated himself through verticality from “that offensive variety of the genus of primates, the common tourist.” He stopped short of suggesting their death “by leaving arsenic about,” but felt “perfectly satisfied if they be confined to a few penal settlements in the less beautiful valleys.”¹¹⁰ His solution was simple: he climbed into “regions still in all the freshness of their primitive innocence; regions where the ‘Times’ is never seen.”¹¹¹

But, alas, the mountains appealed to women as well. They successfully domesticated the passes and glaciers while the middle-class male mountaineers scurried to reserve the peaks for themselves. Men wrote and published most of the mountaineering narratives, and they are similar to the colonial adventure narratives of the time, like *Heart of Darkness*—in which the women aren’t even named—and *King Solomon’s Mines*—dedicated to “all the big boys and little boys who read it.”¹¹² The absence of women was a means of fortifying an all-male preserve. Yet, just like their colonial counterparts, or Michael Robinson’s manly Arctic narratives and Nathan Ensmenger’s computer programmers (both in this volume), mountaineers aggressively affirmed an all-male zone that did not really exist.

By the last decade of the century, most of the high mountains were being attempted, if not summited, by women climbers, often in all-female climbing parties. When American Annie Pec climbed the Matterhorn in 1896, several women had already made the climb. On her way up, she ran into two other women who had just traversed the mountain, up the Lion’s ridge from Italy and down the Hornli ridge into Switzerland, the route first climbed by Tyndall in 1868. By the last decades of the century, Gertrude Bell, Nelly Bly, Fanny W. Bullock, and many others were moving ever onward and upward, not only in the Alps, but also abroad into Africa, South America, and the Himalayas.

While Dickens could pejoratively zone the Alps according to class and stupidity, Stephen got the metaphor right. Humans, like plants, had certain innate limits. In the mid-Victorian era, these limits were regularly gendered by elevation. It was acceptable for women to domesticate the lowlands, even the temperate zone. They could have the valleys and glaciers, which were no longer considered places of manliness. “Those who keep to the low levels, who never carry an ice axe and never need a rope,” the *Saturday Review* noted, “do not know the meaning of hardship or the virtue of courage.”¹¹³ Those who made “the ordinary tours in Switzerland,” another scoffed, had no notion of the “higher altitudes of the Alps” where “eye, ear, and brain are constantly called into play.”¹¹⁴ Through extensive bodily privation, exertion, and self-experimentation, male alpinists attempted to codify the high Alps, the third and uppermost Switzerland, as an all-male preserve.

¹⁰⁹ “Alpine Travellers,” *Bentley’s Quarterly Review* 2 (1859): 214–43.

¹¹⁰ Stephen, *Playground* (cit. n. 20), 150.

¹¹¹ *Ibid.*, 168.

¹¹² I owe the connection to colonial adventure narratives to David Agruss. See also Kathryn Marie Smith, “Revis(it)ing Joseph Conrad’s *Heart of Darkness*: Women, Symbolism, and Resistance” (MA thesis, Florida Atlantic Univ., 2009).

¹¹³ “Hours of Scrambling Exercise” (cit. n. 15), 59.

¹¹⁴ “Mountaineering” (cit. n. 21), 288.

Increasingly, Victorian mountaineers turned to their bodies, and the bodies of their guides, to zone the high Alps as masculine, pioneering a new approach to high-altitude physiology, especially within the British context. While British physiology stagnated between 1840 and 1870, the field flourished on the Continent, becoming according to historian Gerald Geison “an increasingly rigorous and more broadly based experimental science,” represented by the laboratory work of Claude Bernard.¹¹⁵ Bernard’s student, Paul Bert, turned his attention to questions of endurance, and the physiological responses of humans to extreme environments, by building expensive evacuation chambers. Ironically, the supposed “father” of high-altitude physiology never left his laboratory near sea level in Paris.

In England, the rise of the physiology laboratory came later, in the 1870s and 1880s, spearheaded by Michael Foster in Cambridge and T. H. Huxley at the Royal School of Mines. They focused little on questions of endurance or the physiological responses of humans to extreme environments.¹¹⁶ Yet a parallel approach, which has received far less attention, was also taking off at this exact time. British mountaineers, represented here by Edward Whymper, were moving not into the laboratory but out into the field—or, rather, they were transforming the field into a laboratory. Evacuation chambers and balloon ascents did not allow for long-term incursions into high-altitudinal zones. Only mountaineers, spending weeks at a time at extreme heights, could gain useful knowledge of how the human body responded to lack of oxygen for extended periods.¹¹⁷ Whymper’s treks to the snows of Chimborazo represent one of the earliest examples of a British alpinist mounting an expedition to high altitudes specifically to analyze the effects of low pressures on human physiology.¹¹⁸

This transformation of geographic space, turning a mountain into a laboratory, became, as Sarah Tracy has noted, “an essential element of physiological research during the first half of the twentieth century.”¹¹⁹ Whymper’s vertical approach—his extended stays at high elevations, his method of systematic, bodily examination, and his comparative observations at lower elevations—all became accepted methods later in the nineteenth century and into the twentieth. They are seen, for instance, in Angelo Mosso’s work on Monte Rosa in the 1880s, John Haldane’s and C. G. Douglas’s work on Pike’s Peak beginning in the 1910s, and Ancel Keys’s work on the Chilean volcano Cerro Aucanquilcha in the 1930s, among many others.¹²⁰ Although historians and physiologists alike point to these examples of high-altitude, field-based research as a new approach to general physiology,¹²¹ they had their roots in mid-Victorian questions

¹¹⁵ Gerald L. Geison, *Michael Foster and the Cambridge School of Physiology: The Scientific Enterprise in Late Victorian Society* (Princeton, N.J., 1978).

¹¹⁶ *Ibid.* See also Michael Foster, *A Textbook of Physiology* (London, 1877); and T. H. Huxley, *Lessons in Elementary Physiology* (London, 1869).

¹¹⁷ Charles S. Houston, “Lessons to Be Learned from High Altitude,” *Postgraduate Med. J.* 55 (1979): 447–53.

¹¹⁸ Michael P. Ward, James S. Milledge, and John B. West, *High Altitude Medicine and Physiology* (Philadelphia, 1998), 11. As Philip Felsch has argued, prior to this there seemed to be a “Victorian animosity toward fatigue studies.” See Felsch, “Mountains of Sublimity, Mountains of Fatigue: Towards a History of Speechlessness in the Alps,” *Sci. Context* 22 (2009): 341–64, on 358.

¹¹⁹ Sarah W. Tracy, “The Physiology of Extremes: Ancel Keys and the International High Altitude Expedition of 1935,” *Bull. Hist. Med.* 86 (2012): 627–60, on 629.

¹²⁰ *Ibid.*; Felsch, “Mountains” (cit. n. 118).

¹²¹ Tracy, “The Physiology of Extremes” (cit. n. 119); W. Brendel and R. A. Zink, *High Altitude Physiology and Medicine* (New York, 1982), xii–xiii; Ward, Milledge, and West, *High Altitude Medicine* (cit. n. 118), 11.

of manly endurance and the physical limits of the human frame.¹²² Whymper provided an example of how to turn a mountain into a physiological laboratory and people into scientific objects.

By defining a high, vertical zone based on the inner workings of the human body, Whymper and other mountaineers incorporated gendered constructions into their science, concepts that could be translated seamlessly into cultural discourse. Similar constructions can be seen, for instance, in the rise of the popularity of sports, the cult of the athlete, and in the revival of the Olympic Games. They appear in what became “sports medicine” and “nutritional physiology” later in the twentieth century.¹²³ And they formed one of the foundations of high-altitude physiology, a science that is still primarily a male preserve.¹²⁴ The connection between human physiology and definitions of masculinity, first formulated on the sides of mountains, appeared natural, based on physical abilities. But it took quite a bit of endurance on the part of the mid-Victorian mountaineers to make it that way.

¹²² Hoberman, *Mortal Engines* (cit. n. 7), 65.

¹²³ Tracy, “The Physiology of Extremes” (cit. n. 119).

¹²⁴ As an example, the editor-in-chief, both associate editors, and thirty-six of the forty-two members of the editorial board of *High Altitude Medicine and Biology* are men.