

Victorian Scientific Naturalism

Community, Identity, Continuity

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Evolutionary Naturalism on High: The Victorians Sequester the Alps

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The world is not all radiant and harmonious; it is often savage and chaotic. . . . The nature-worshippers are blind and deaf to the waste and the shrieks which meet the seekers after truth.
—“COSMIC EMOTION,” *New York Times*, 28 August 1881

Introduction

Mont Blanc, 12 August 1857. A professional Swiss guide was leading three British mountaineers amid massive boulders under the shadow of the Aiguilles du Midi. As they slowly made their way through a confusion of crags, they ascended to the Glacier Peirins, where the famous “Humboldt of the mountains,” Horace-Bénédict de Saussure, had nearly lost his life in 1787. Two more hours and they stood together on the Glacier du Bossons, where they strapped woolen leggings up to their knees and tied ropes around their waists. One particularly tricky snow bridge, the midsection of which had melted away, required a precarious leap over an immense chasm. John Tyndall made the jump first, followed by his lifelong friend Thomas Archer Hirst, but Thomas Henry Huxley stood frozen at the edge, overwhelmed with fear. The year before he had made a false step on the Grimsel Pass, which according to Tyndall had nearly cost Huxley his life. His foot had slipped and he had fallen some way before coming to an abrupt stop with his legs overhanging a deep abyss.¹ That memory came foremost to Huxley’s mind, now mixed with fatigue and uncertainty, as he tentatively made the jump. Once safely across, he emptied his flask of brandy in one large gulp. “Tyndall,” he exclaimed, “I am quite exhausted. . . . I have determined not to attempt the ascent. I thought as I sat beside that crevasse that it was hardly fair to those at home to incur such peril.”²

With steep steps cut into the ice by their guide, all three made it safely to the Grand Mulets, and then farther up to a primitive “cabane” made of boards stretched between upright posts. Huxley lay in the corner, motionless, while the guide discussed with Tyndall the next day’s summit attempt.

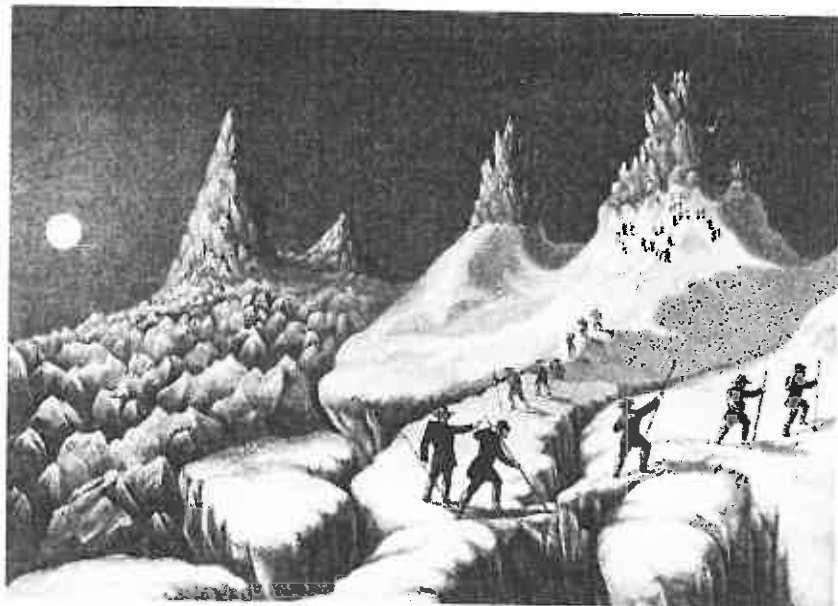


FIGURE 2.1. An exposed snow bridge on the approaches to Mont Blanc, near the Grand Mulets. From George Baxter, *Leaving the Grand Mulets* (1855), N. 2, *The Ascent of Mont Blanc*, Lewis 336a, Harvard Art Museums / Fogg Museum, Gift of Charles H. Taylor, M4486.

All three couldn't make it, the guide whispered, especially Huxley. "What does that fellow say?" Huxley demanded, an absent expression on his face. "Does he mean that I am not to go to the top? I will go or else throw myself into a crevasse."³ Tyndall realized immediately that Huxley was asleep, and he would have no recollection whatsoever of his rather bizarre outburst.

Beginning early the next morning, Hirst and Tyndall completed the ascent, the first time either had stood on the summit of Europe's highest peak. It was an arduous climb, across crevassed glaciers, rocky precipices, and seemingly endless snowfield. It took them much longer than they had planned, and they did not return to the makeshift hut until well after dark. Hirst was so exhausted that he could barely move, while Tyndall looked "altogether shabby," with both arms of his coat torn and one toe kicked out of his boots. But it was Huxley who seemed worse for all his worrying. He had spent over seventeen hours "a prisoner" in the hut, and his relief upon hearing their return was palpable. "To the end of my life, Tyndall," he said, exasperated, "I can never forget the sound of your batons when you reached the rock."⁴

I begin with this vignette because, in and of itself, it is quite striking: three future members of the X Club clambering together on the approaches to Mont Blanc—three young researchers who would all become recognized au-

thorities in their respective fields. Imagine the conversations they must have had during their days trekking through the mountains. Even more striking is that this camaraderie in the high mountains was far from an unusual occurrence. Most members of the X Club were mountaineers.⁵

Though overlooked today, Hirst was well connected in Victorian scientific circles.⁶ He first met Tyndall in June 1846 while both worked as railway surveyors. He then followed Tyndall first to Marburg, then to Queenwood, replacing Edward Frankland in 1853 as a teacher of geometry and surveying until 1856. After a few years of wandering through Europe after the tragic death of his wife, he returned to London in 1860, where he embarked on a successful career as an educator, administrator, and acute mathematician. He accepted the chair of mathematical physics at University College, London, in 1865. He was Tyndall's first climbing partner, a "fellowship of the rope" that matured into a lifelong friendship. He always viewed Tyndall as his mentor, "my angel of mercy, my guiding star," he wrote.⁷ After accompanying Tyndall to the top of Europe's highest peak in August 1857, he returned to the Alps several times in the early 1860s to help his mentor take measurements of glacier motion. Six feet two inches tall, he had a perfect climber's build, able to match, step by step, Tyndall's alpinist gait. They shared a different type of fellowship as well. "I belonged to the pagan persuasion," he admitted to Francis Galton later in life, a "bias toward freedom of thought in religious matters."⁸

Joseph Dalton Hooker had made two long treks into Sikkim and Nepal in 1849 and 1850.⁹ On his second journey, a six-month hike into western Nepal, he climbed above the Donkai Pass to well beyond nineteen thousand feet before slipping into the forbidden land of Tibet. Upon his return to Sikkim, his climbing partner Archibald Campbell was arrested and beaten, and both were detained for almost two months. Whenever and wherever he climbed, he gathered plant specimens at different elevations, particularly species of rhododendrons, to document their variations in changing environments. It is not often stressed that Charles Darwin dedicated an entire chapter of *On the Origin of Species* (1859) exclusively to mountain biogeography, material that he had gathered largely from his confidant Hooker in the Himalayas.

Edward Frankland, one of the most highly respected chemists in the Victorian era, spent twenty-two hours on the top of Mont Blanc in August 1859, accompanying Tyndall on his third ascent of the mountain. They were the first two mountaineers to spend the night atop Europe's highest peak. They performed experiments of all kinds as they ascended, including the burning of candles at different elevations. Over the next decade, Frankland continued this research in his laboratory, demonstrating that varying atmospheric pres-

tures affect luminosity.¹⁰ In collaboration with Norman Lockyer, he applied his mountaineering observations to advance our understanding of the gases composing the sun. He also kept climbing, using other mountain ascents to study the relation of bodily energy to food consumption. As his biographer has noted, this research “marked the first recognition of the ‘calorific value’ of food.”¹¹

The mathematician William Spottiswoode traveled widely throughout Europe, including to the mountainous regions of eastern Russia, Croatia, and Hungary. He used his vast experiences to publish an important paper entitled “On Typical Mountain Ranges, an Application of the Calculus of Probabilities to Physical Geography,” an attempt to find the causes and orientation of the formation of mountain ranges. Francis Galton, another admirer of the Swiss Alps, cited this paper as his first inspiration in applying statistics to the social sciences.¹²

Herbert Spencer went on his first Swiss tour in the summer of 1853. It included trips up the Rhone and Gorner Glaciers, over the Grimsel Pass, and to the top of several snow-clad peaks. He penciled a letter to his brother from the top of the Faulhorn, describing with ecstasy his position “surrounded by a vast panorama of mountains . . . hourly sending down avalanches which sent a peal of thunder across the valley.”¹³ He also rambled throughout the Scottish Highlands. In 1871, in fellowship with both Tyndall and Hirst, he climbed Glen Nevis “up to its top, where it becomes Swiss like in character.”¹⁴ He returned to the Swiss Alps for a second time the following summer in the company of fellow X Clubber George Busk. Together, they explored the glaciers at the base of the Jungfrau.

The point is this: a disproportionately large number of X Clubbers went to the mountains. If you include the most prominent evolutionary naturalists, the list grows longer, though the high proportions stay the same.¹⁵ All were not lifelong mountaineers. Some were just ramblers, what we would call hikers, and what Leslie Stephen disparagingly referred to as tourists. Two of them, however, towered over the sport in the mid-nineteenth century. They were simultaneously the most vocal of the evolutionary naturalists and the two most accomplished climbers of their age—John Tyndall and Leslie Stephen. We can catch a glimpse of the relationship between evolutionary naturalism and high Alpine terrain in the life and works (both intellectual and physical) of these two intrepid mountaineers. Both strove to be the first on the summit of Alpine peaks, and in their published accounts, they focused almost exclusively on the awe-inspiring beauty and exhilarating adventure they experienced in the high mountains. Their journals and personal correspondence, however, tell a different story. They were searching for something far

more ephemeral than first summits. Something drew them to the mountains. The point of this chapter is to figure out what.

Tyndall, Stephen, and the Allure of the Alps

Tyndall first went to the Alps in 1849 with Hirst on a vacation from his studies in Marburg, but he did not begin climbing until the mid-1850s. He spent his first year on a glacier in 1856 accompanied by both Huxley and Hooker. He took quickly to the sport, becoming one of the pioneering climbers during the “golden age of mountaineering.” He narrowly missed being the first to summit the Matterhorn, reaching the penultimate peak of the mountain, now known as Pic Tyndall, in 1862. In 1868 he became the first person to climb the more difficult traverse up from Breuil and down to Zermatt, turning the once-inaccessible mountain into a pass. He also made numerous first ascents of other more formidable peaks throughout the Alps, including the majestic Weisshorn on 19 August 1861, by far the most difficult route to have been accomplished. Unlike other mountaineers, Tyndall preferred to keep to the rocks rather than the ice and snow, and he often climbed without guides. He thus contributed significantly to the advance of both rock climbing and guideless climbing. He spent over twenty-five summers in the Alps, building a second home with his wife, Louisa, above the Bel Alp Hotel, a favorite haunt of British mountaineers.¹⁶

If there was a greater mountaineer at that time, it could only be Leslie Stephen. His *Playground of Europe* (1871) became an instant classic and helped turn the high Alps into a playground for the British, particularly the British agnostic. His crowning achievement was the first ascent of the Schreckhorn on 16 August 1861. His list of other first ascents, too long to mention here, was well known to all mountaineers in the mid-nineteenth century. Tall and lanky, with striking blue eyes and later an equally striking red beard, on more than one occasion he has been described as walking “from peak to peak like a pair of compasses.”¹⁷ Over a forty-year period beginning in 1855, he went to the Alps twenty-five times, his final year in 1894. As his first biographer noted, “His love of the Swiss mountains expired with his last breath.”¹⁸

Bernard Lightman and Ruth Barton have both analyzed the relationship between mountaineering and naturalism during this period. Lightman has argued that the wonders of nature replaced Tyndall’s and Stephen’s need for religion, that their agnosticism was “synonymous with the natural order” that they found in the Alps.¹⁹ Tyndall, in particular, was searching for a replacement for Christianity during the 1850s; according to Lightman, he “yearned for a sense of direction that could only be supplied by a definite creed.”²⁰ As



FIGURE 2.2. John Tyndall on an ascent of the Lauwinen Thor in August 1860, scaling the rock face. He often climbed on the rocks while his guides and porters felt safer on the snow couloir. Note the barometer carried by the last porter. From John Tyndall, *Hours of Exercise in the Alps* (London, 1871), facing p. 11.

Ruth Barton has noted, Tyndall found in the wonders of the Alps the direct engagement with nature that he needed to formulate a “complete philosophy of life.”²¹ It was in the Alps while mountaineering that he learned to connect the two sides of human nature: feeling and intelligence. This chapter is in the spirit of refining these previous stances rather than overturning them. What did Tyndall and Stephen find so appealing about the mountains? How did mountaineering lead to a “complete philosophy of life”? Fortunately, these

were the exact questions that both Tyndall and Stephen contemplated in their journals and attempted to answer in print. Stephen, in particular, was an adamant defender of the faith, in this instance the faith in the complete and utter goodness of mountaineering.

So, why did Tyndall, Stephen, and so many other evolutionary naturalists go to the mountains? An initial, crude answer can be gleaned from the opening vignette about Huxley on the Grand Mulets: the terror he experienced at the edge of the bottomless crevasse. In the Alpine environment, perhaps more than in any other, all climbers eventually feel real terror for their lives. There comes a point in all of Tyndall’s and Stephen’s writing where something has gone wrong and the result is the real possibility of death. Tyndall often spoke of the calmness that came over him at those moments.²² It was slow paced, an extremely focused experience. Once that happened, it stayed with them forever, at least in a philosophical sense. It enabled them to critically analyze death—and life—in a manner that others could not. As Stephen wrote, “Your mind is far better adapted to receive impressions of sublimity when you are alone, in a silent region, with a black sky above and granite cliffs all round, with a sense still in your mind, if not of actual danger, still of danger that would become real with the slightest relaxation of caution.”²³

Both Tyndall and Stephen wrote extensively of their experiences with danger and death in the Alps. In 1865, the year of the Matterhorn tragedy when four climbers fell over three thousand feet to their deaths, Tyndall spent several days searching for their mutilated bodies. Later that same summer, he scaled the cliffs of the Riffelhorn, which had taken the life of Knyvett Wilson, a Rugby schoolmaster, only a week earlier. Tyndall also climbed the Schilthorn that summer, where Alice Arrbuthnot, a twenty-one-year-old on her honeymoon, had the previous month been struck and killed by lightning.²⁴ In his publications, Tyndall downplayed the dangers he experienced, but his journals and letters, especially to Huxley and Hooker, are filled with derring-do of all kinds, as he recounts the desperate chances he often took falling into crevasses, sliding down avalanches, and tiptoeing across cliff bands.²⁵ Stephen, likewise, often acted as if anyone could summit a peak in the Alps, though he did acknowledge the irresponsible positions he often put himself into.²⁶

Bruce Hevly quite correctly argued that the Victorians used these dangerous experiences to add reliability to their claims. “Heroism,” Hevly noted, “with its elements of direct action, lonely commitment, and manly risk, helped to shape arguments over glacier physics.” Authority, that is, was gained primarily through the “physical discomfort, if not immediate danger” that each scientist experienced as he climbed.²⁷ Yet, though we certainly need

to acknowledge the gendered notions at work, the immediacy of the danger was also what led directly to a sophisticated inward analysis of one's own psyche. It was one of the reasons Tyndall and Stephen went to the Alps.

In their journals and publications, Tyndall and Stephen closely associated the danger that they experienced in the mountain environment with their own insignificance and place within the natural order. Tyndall, while climbing the Aiguilles du Midi, wrote in his journal of 4 August 1857:

It was a fine, and in some degree a fearful sight; for amid these gigantic chasms and ridges, plates and pinnacles, we lacked the assurance that acquaintance even with dangerous places brings. Our guide was never here before, no guides come here, and the twisted[,] pitted and riven ice is most treacherous looking. . . . Thus there is a dash of awe connected with our sciences—stirring up the feelings, which mix themselves with the intellect and invade its cold tranquility. What is man physically speaking amid the agents which nature here exhibits[?] An ice pebble would crush him to atoms, an ice furrow if he fell into it, would be his grave.²⁸

It was through such experiences that Tyndall experienced otherworldliness. After a day among the fissures of the Aletsch Glacier, he wrote, "Beside such might, man feels his physical helplessness, and obtains the conception of a power superior to his own. His emotions are stirred. His fear, his terror, his admiration[;] he ends his survey breathing into the rushing cataract a living soul."²⁹ The rugged terrain of the Alps forced Tyndall to grapple with the mystery beyond life; it stirred his emotions, his fear, terror, and admiration.

In his own writings, Stephen echoed a similar spirit. On the sides of the Eiger-Joch, he opined, "The mountains represent the indomitable force of nature to which we are forced to adapt ourselves; they speak to man of his littleness and his ephemeral existence; they rouse us from the placid content in which we may be lapped when contemplating the fat fields which we have conquered and the rivers which we have forced to run according to our notions of convenience."³⁰ Experiencing the mountain by climbing it, for Stephen, was a way in which to learn about one's place in nature. It focused his impressions of the sublime.

Other reasons for going to the mountains are more straightforward, more tactile. As Tyndall always believed, "The aspects of nature are more varied and impressive in Alpine regions than elsewhere."³¹ The mountains enabled him to experience nature firsthand, to see its laws in action, in situ. In the mountains, more than anywhere else (excepting perhaps the littoral environment), one could experience the laws of nature at work in all its aspects: in deep time in the formation of mountains and the carving out of valleys, in shallow time in the movement of glaciers, and in a single day by traveling

through Humboldt's vertical zones. After his first day on the Mer de Glace, Tyndall wrote, "It is difficult, in words, to convey the force of the evidence which this glacier presents to the observer who *sees* it; it seems in fact like a grand laboratory experiment made by Nature."³² Stephen also focused on this aspect of his experience: "The Alpine fabric includes an inexhaustible wealth of natural wonders. No other mountain chain of Europe includes, like the Alps, the flora of three zones. The arctic and the temperate join hands with the tropical, and we find representatives of the vegetation of more than thirty degrees of latitude in a short space."³³ In the mountains, a personal laboratory opened up for those who could reach it.³⁴

For both Tyndall and Stephen, the mountains provoked an instinct to think of the deep past, and thus to learn firsthand about the geology of the earth. "It is in the mountains," Stephen opined, "that we instinctively ask what force can have carved out the Matterhorn, and placed the Wetterhorn on its gigantic pedestal."³⁵ As Tyndall noted on the sides of the Schleckhorn on 4 August 1861, "The mind involuntarily reverts to the past, and from a few scattered facts we restore a state of things which existed and had ceased before the advent of man upon the earth. Whence this power?"³⁶ For Tyndall and other agnostics, the questions posed by mountains were especially important.

Tyndall approached the mountains as a practicing scientist, intent on formulating long-term research projects. As he pointed out, he was not equipped as some men were with the kind of brain that has "those quick single flashes which illuminate detached problems . . . and thus make quick work of the question."³⁷ While grappling with the glacier questions, for instance, as with all other scientific questions, he admitted that his "thoughts ripen slowly, and it is only by degrees that I see the importance of certain observations and measurements." Using a mountain metaphor to explain the scientific process, he noted that, "as a general rule, the dominant result does not stand alone, but forms the culminating point of a vast and varied mass of inquiry."³⁸ Tyndall had to be immersed in nature to fully contemplate it, to experience it slowly day after day, climb after climb, year after year, similar to the slow movement of the glaciers he was studying.

The mountains enabled Tyndall and Stephen to contemplate nature's intricacies, its beauty and desolation, its order and chaos, its past and present. Tyndall, as one of the premier definers of the new specialty coalescing at that time, used his experience in the mountains to help define physics.³⁹ It included those subjects he experienced on a personal level within the Alpine environment, those "which lie nearest to human perception:—light and heat, colour, sound, motion, the loadstone, electrical attraction and repulsions,

thunder and lightning, rain, snow, dew, and so on."⁴⁰ In his public lectures at the Royal Institution and in his more popular publications, Tyndall freely mixed his two pursuits, helping to advance both the definition of physics and the acceptance of the new sport of mountaineering.

It would be incorrect, however, even for Tyndall, to view his experiences as primarily scientific. For Tyndall, and certainly for Stephen, something more austere was at work than merely nature's laws. There was a mystery behind nature that the mountaineer was in a propitious position to uncover. That mystery, moreover, was deeply personal. When finally reaching the summit of the Weisshorn, Tyndall wrote in his journal, "We formed the centre of an Alpine circle of unparalleled grandeur, Switzerland, Savoy, Italy, all spread their mountain treasures before us. I opened my note book to write a few words concerning the scene, but I was absolutely unable to do so. I delivered myself up to the silent contemplation of it. Completely overpowered and subdued by its unspeakable magnificence."⁴¹ Often, the beauty and chaos of it all could not be studied or written about; it could only be breathed in. For what Tyndall was searching for, feelings and emotions always trumped science and the intellect.

While Tyndall viewed the Alps through the lens of science, Stephen approached them more as a poet. Like other evolutionary naturalists, he had come from a family steeped in the Anglican evangelical tradition. He was a weak, frail, and sickly child.⁴² His father had attended Trinity Hall in Cambridge and had become the regius professor of modern history at Trinity College. The young Leslie followed his father to Trinity Hall, where he took his first major steps toward athleticism, becoming an avid rower. He also kept to his studies. Coached by Isaac Todhunter, an accomplished mathematician and the first biographer of William Whewell, Stephen scored well enough on the Mathematical Tripos Exams to attain a fellowship at Trinity Hall, an accomplishment that required him to take orders.⁴³ He was made deacon in December 1855 and ordained a priest the next year.⁴⁴

These were also the years Stephen first went to the Alps, in 1855 to the Bavarian Highlands, and again in 1857, his first real climbing season on glaciers, including a remarkable ascent with Francis Galton to the top of the Col de Geant.⁴⁵ He returned in 1859 to make the first ascent of the Bietschhorn. He also ascended the Dom that year, the third highest peak in the Alps, and he attempted the mighty Weisshorn, though without success. He returned to the Weisshorn in 1862 to make the second successful summit of the mountain.

The timing here is suggestive. Stephen was ordained a priest in 1856, and his major achievements in climbing came in 1859, 1860, and 1861. He was thirty years old and the most accomplished mountaineer in Europe. He also

experienced a crisis of faith and could no longer take part in religious services.⁴⁶ He resigned his tutorship in 1861. "I now believe in nothing, to put it shortly," he admitted, "but I do not the less believe in morality, etc. etc., I mean to live and die like a gentleman if possible."⁴⁷ That same year, his first book publication appeared in print. It was not his own work, but rather a translation of Baron Hermann von Berlepsch's *Die Alpen*, translated as *The Alps; or, Sketches of Life and Nature in the Mountains* (1861).

Once we know of Stephen's later publications, this seems an odd beginning to his publishing career. It was a book on mountaineering, plain and simple. Baron Berlepsch's approach to the mountains was unquestionably secular in nature. It was not God that one finds in the mountains, but the unvarying nature of nature's laws. The story is told in the vertical, as the baron (and Stephen) take the reader from the civilized world of towns and beautiful ladies, up through the larch and stone pine forests, past rock and ice, to a climax on a hypothetical summit. The section on mountain summits ends with the question "What is the use of going up there?"⁴⁸ The baron's answer is also Stephen's answer:

It is the feeling of spiritual power that glows in him, and drives him to overcome the dead horrors of nature; it is the charm of measuring the power peculiar to man, the infinite capacity of an intelligent will, against the rough opposition of dust; it is the holy impulse to seek out, in the service of the everlasting science of the earth's life and framework, for the mysterious connection of all creation; it is perhaps the longing of the lord of the earth to place the seal on his consciousness of a relationship to the infinite, by a bold free deed on the last conquered height, looking round on the world lying at his feet.⁴⁹

Though couched in religious terminology, the "longing" is a personal quest to comprehend the beauty and chaos of nature. The experience is emotional and spiritual but not religious. The "lord of the earth" seeking the "mysterious connection of all creation" is Stephen himself.

In his own *The Playground of Europe*, published ten years later, Stephen used Berlepsch's account of mountains and their meaning as his model. The text begins as a history of climbing and the transition from the "old school" to the "new school" of climbers. Surprisingly, the key transitional figure is not de Saussure or some other notable pioneering mountaineer, but Jean-Jacques Rousseau. Note the religious imagery used to formalize the complete secularization of the mountains: "Rousseau was the arch-heretic who instituted a regular and avowed worship of the Alps. . . . [He] set up mountains as objects of human worship. . . . Rousseau, though partly anticipated, and though his revelation had to be completed by various supplementary prophets, may be called, without too much straining of the language, the Columbus of the

Alps, or the Luther of the new creed of mountain worship.⁵⁰ Implicit in this dubious history is the complete ousting of natural theology from the realm of mountaineering, a parallel to the work of Tyndall and others in the sciences.⁵¹ “The love of mountains,” Stephen averred, “came in with the rights of man and victory of the philosophers.”⁵² By dispelling God and godliness from his narrative, Stephen is free to focus exclusively on what is so meaningful about Alpine excursions: “Its charm,” according to Stephen, “lies in its vigorous originality” and connection with “all that is noblest in human nature.”⁵³ The point of the book is to show that this nobility comes at a price: “those love [the mountains] best who have wandered longest in their recesses, and have most endangered their own lives and those of their guides in the attempt to pen out routes amongst them.”⁵⁴ Danger brought excitement, but also knowledge and meaning. It cleared the head. As he put it, “Sluggish imaginations require strong stimulants.”⁵⁵ Yet, for that to occur, those experiences had to be extremely tangible, dangerous, and perhaps even terrifying, “food highly spiced enough for such robust digestion.”⁵⁶

The text then recounts his most famous mountaineering accomplishments, including the first ascent of the Schreckhorn. The mountain had been attempted before, by the Swiss naturalist Joseph Hugi in 1828, for instance, and by the Swiss geologist Pierre Desor in 1842. Stephen climbed it by ascending the upper Schreck couloir to the ridge and then following the south-east ridge to the top. His successful first ascent gave Stephen an “acute attack of the climbing fever.”⁵⁷ A climb up the Rothhorn was the perfect antidote, as the final summit consists of a sharp ridge that climbers are forced to sit astride, with a leg hanging over each side of the precipice. “I found myself fumbling vaguely with my fingers at imaginary excrescences, my feet resting upon rotten projections of crumbling stone, whilst a large pointed slab of rock pressed against my stomach.”⁵⁸ This sounds curiously like his hypothetical near-death experience, published as “A Bad Five Minutes in the Alps,” discussed below. Obviously proud of his own accomplishment, he allowed himself to boast of his climbing prowess. “I will not tell at length how I was sometimes half suspended like a bundle of goods by the rope; how I was sometimes curled up into a ball, and sometimes stretched over eight or nine feet of rock. . . . I conceived myself to be resting entirely on the point of one toe upon a stone coated with ice and fixed very loosely in the face of a tremendous cliff.”⁵⁹ It was only by “dallying with danger” that one could learn to “appreciate the real majesty of an Alpine cliff.”⁶⁰ And only through such an appreciation could true knowledge be attained.

Stephen ended his text, just as the baron had, with a hypothetical climb to a distant peak, in an attempt to express the reasons why he climbed, why



FIGURE 2.3. Leslie Stephen climbing the approaches to the Rothhorn. From Leslie Stephen, *The Playground of Europe* (London: Longmans, Green, 1871), frontispiece.

everyone should climb. “Now the first merit of mountaineering is that it enables one to have what theologians would call an experimental faith in the size of mountains—to substitute a real living belief for a dead intellectual assent.”⁶¹ If the main influence of mountains consisted in their enormous size, their steepness, their terror, then the mountaineer had the advantage of actually experiencing these aspects firsthand. It enabled one “to measure that magnitude in terms of muscular exertion instead of bare mathematical units.”⁶² One could only do this by experiencing the mountain personally, on its highest crags, not from the confines of a hut or low-lying valley.

This intimacy with nature was also exactly what Stephen experienced on nonhypothetical summits, such as the Wetterhorn. "Now any one standing at the foot of the Wetterhorn," Stephen wrote, "may admire their stupendous massiveness and steepness; but, to feel their influence enter in the very marrow of one's bones, it is necessary to stand at the summit, and to fancy the one little slide down the short ice slope, to be followed apparently by a bound into clear air and fall down to the houses, from heights where only the eagle ventures to soar."⁶³ The experience is always mediated through danger, which is what so excited the imagination. On a mountain slope, avowed Stephen, the powers of nature "are impressed upon the mountaineer with tenfold force and intensity . . . open[ing] up new avenues of access between the scenery and his mind."⁶⁴ Stephen realized that the word *beautiful* was misleading when attempting to describe mountains; rather, "they have a marvelously stimulating effect upon the imagination."⁶⁵ In short, mountains made you think.

Think, yes, but not of God. Stephen's mountaineering and his crisis of faith seemed to be inextricably mixed. Thus, it is fitting that Stephen chose mountaineering as the subject to first describe his agnosticism.⁶⁶ Published in *Freethinking and Plainspeaking* in 1873, a long article entitled "A Bad Five Minutes in the Alps" was his chance to write about facing death. According to his first biographer, it was "perhaps the most readable bit of theological controversy in existence."⁶⁷ The tale begins in a remote mountain hut, with the smoke of tobacco pipes inside mimicking the mist outside. Stephen had been reading an old journal announcing that "an energetic controversy was raging as to the efficacy of prayer," which some "bold man" had argued was "an obsolete superstition."⁶⁸ The stupidity of the arguments on both sides led him to quit the hut, brave the weather, and take a stroll. After several hours tramping through the rain, and turning into a human sponge in the process, he decided to take a shortcut, which, like most shortcuts in the mountains, caused him to lose his way. The tall tale continues with a short crossing of a cliff face for just a few yards, with only one hard climbing move, that was it, enabling him to regain the trail. He slipped in his attempt. One small handhold kept him from the torrent some two hundred feet below and the prospect of turning his body into a "heap of mangled flesh and bones."⁶⁹ He tried to get his feet secure on the rock, but the entire surface had been polished by an ancient glacier. "A geologist would have been delighted with this admirable specimen of the planing power of nature," Stephen acknowledged. "I felt, I must confess, rather inclined to curse geology and glaciers,"⁷⁰ a feeling he extended to all of science, particularly "to gravitation and the laws of motion."⁷¹

As he hung suspended, he tried to calm himself by thinking of past sermons that he had heard, but he could not get hateful thoughts out of his

mind. What was he doing on the side of a cliff in the first place? He hated the cliff, but he also had "an unpleasant sense that my hatred could do it no harm."⁷² It dawned on him that the "whole doctrine preached by the modern worshippers of sublime scenery seemed inexpressibly absurd and out of place." This led him to ask, "What is this universe in which we live, and what is, therefore, the part we should play in it?"⁷³ He duly ran through the answers given by "Protestants, Catholics, Epicureans, Positivists, Broad Churchmen, Pantheists, and a vast variety of sects."⁷⁴ Yet, each sect seemed to contain "gratuitous falsehoods." His main objection to Christianity was the belief that all humans were accomplished sinners—vile, bad people. It was a good world as far as worlds went, he thought, and the people in it were good too, if a bit lazy in their thinking, "mechanically repeating fragments of an old melody from which all sense has departed."⁷⁵ Luckily, another doctrine was at hand: Christianity, but without all the damnation and vile humanity bit. The corruption of mankind, in this view, was just a "biblical way of stating Mr. Darwin's doctrines."⁷⁶ Yet, this seemed far too Panglossian for his taste. If one got rid of hell and God fire, could one really still believe in heaven and God's benevolence, directed at each individual soul? He doubted it. He decided, therefore, to stick to the brute facts: he was made of flesh and bone, "a machine, with food for fuel, grinding out so much thought, motion, and producing sundry chemical and mechanical changes in surrounding objects."⁷⁷ He would simply transform after death: "What was me will be part of the glacier stream, increasing the deposits on the flanks of the mountains."⁷⁸ Yet even this answer fell short, for he cared nothing for his body parts once they were disconnected from his actual body. This sort of brutal materialism was, in his mind, unfruitful.

Truth is, Stephen realized, nothing had meaning except visceral experiences, and the desire to keep holding on even though all other options were played out "and one theory of the universe seemed to be about as uninteresting as another." The only answer to make sense was survival and the experience of life. And survive he did. He fell, but merely to a mossy ledge some ten feet below. His last thought in those five minutes was whether he could make it back to the hut for dinner.⁷⁹ Eating a hearty meal among friends in a mountain hut was the type of fellowship he required. For Stephen, at least, that was his garden, and he intended to cultivate it.

Noel Annan suggested that "Stephen went to the Alps to climb and for no other reason."⁸⁰ But that is simply not true. He went to the Alps to climb, certainly, but there were many other reasons. Or, to put it another way, if he went to the Alps only to climb, he did so because climbing gave him so many other experiences: danger, for one; feelings of the sublime, another; his own

insignificance, yet another. It was more than plain fun. It was outwardly satisfying, but equally inwardly appealing. It was his time for introspection.

Conclusion

There is assuredly morality in the oxygen of the mountains.
—JOHN TYNDALL, *Hours of Exercise in the Alps* (1871)

The two great defenders of agnosticism were also the two greatest climbers in the golden age of British mountaineering. The height of their climbing came in the early 1860s, the same years in which they formulated their own evolutionary naturalism. The two great agnostics, the two great mountaineers, the two defiant defenders of both of those faiths, hopscotched over each other on the sides of the Swiss Alps.

The paths of these two mountaineers often crossed in the Alps. Neither was a founding member of the Alpine Club, but both were elected the first year, in 1857, the only two. In 1858 Stephen climbed the Mont Rosa, the second highest peak in the Alps. The next year, Tyndall climbed the peak alone, without a guide, the first successful solo attempt on the peak. Tyndall was the first to climb the Weisshorn, in 1861; the second person to climb it was Stephen, in 1862. They were fiercely competitive, chasing each other up peaks. As Stephen humorously put it, "Racing in the Alps is an utter abomination, and I have never been guilty of such a crime; except, indeed, once in an ascent of Mont Blanc, and again, I fear, in a dash up the Aeggishorn, and yet once or twice more on some of the Oberland peaks, and perhaps on a few other occasions."⁸¹ Sometimes their competitive natures produced tensions. In his account to the Alpine Club of his ascent of the Rothhorn, Stephen did not hide his disdain for those who climbed for science: "And what philosophical observations did you make? will be the inquiry of one of those fanatics who, by a reasoning process to me utterly inscrutable, have somehow irrevocably associated alpine traveling with science. To them I answer, that the temperature was approximately (I had no thermometer) 212 Fahrenheit below freezing point. As for ozone, if any existed in the atmosphere, it was a greater fool than I take it for."⁸² These and similar statements rubbed Tyndall—who was well known for his study of the ozone and who had rarely left a hut without a thermometer—and other scientists within the Alpine Club the wrong way.⁸³

In the end, however, the two prominent intellectuals shared much more than either would perhaps have admitted. Both found in the Alps a consolation for their loss of faith, an outlet for their agnosticism, and a perfect

backdrop for their search for meaning. Both brought the same, fundamental question to the mountains: could one be a moral person without believing in a Christian God? One a literary critic, the other a scientist, they both went climbing to find some basis to create a justifiable ethic. This is why there is so much religious language in the mountaineering narratives of both Tyndall and Stephen. Their new secular approach necessarily contained aspects of the language it was created to overturn, especially in its use of religious imagery.⁸⁴ Bernard Lightman cites Frederic Harrison, who observed that "the Alps were to Stephen the elixir of life, a revelation, a religion," and he rightly notes that Stephen often spoke of the Alps as a "sacred place."⁸⁵ The famous mountaineer Douglas Freshfield once said, "The Alps were for Stephen a playground but they were also a cathedral."⁸⁶ As both Barton and Lightman have found, Tyndall's descriptions of the Alps sometimes read like religious experiences.⁸⁷ Lightman quotes Huxley as referring to Tyndall as the "mightiest evangel" of that "sect of muscular philosophers whose best known church is the Alpine Club."⁸⁸

Yet, we must be careful here: It is not the mountains that they are revering; it is their visceral experience of the mountains that forms the basis of their faith. The mountains were not holy or sacred; they were not places of worship. Rather, they were perfectly secular spaces where the imagination was allowed to ramble, just as the body was allowed to scramble. Drawing on Humboldt, de Saussure, and Rousseau, they were following decidedly secular approaches to nature in their mountaineering narratives.

The Alps were not a substitute for religion, then, in the simplest sense. Tyndall and Stephen did not worship them as one would worship a deity. Rather, they went to the mountains as the perfect place to think about topics that others associated with religion, like morality and the human condition. Both were searching for feeling and emotion, to hear what the mountains had to say. The mountains spoke to them, often in the harshest of terms, at other times in a soothing, familiar voice. As Stephen wrote, the mountains spoke "in tones at once more tender and more awe-inspiring than that of any mortal teacher. The loftiest and sweetest strains of Milton and Wordsworth may be more articulate, but do not lay so forcibly a grasp upon my imagination."⁸⁹ Amid the seracs and glaciers of Mont Blanc, Tyndall wrote in his journal, "We fill our brains with thought and occupy our understanding with problems. Our capacity for such things is our justification for occupying ourselves with them, but amid these sublime summits, looking at these stars, listening to that wailing wind, the mind also proves its capacity for thought more solemn than those which occupy the understanding."⁹⁰ Their relation-

ship to nature had to do with understanding the natural world, experiencing it personally and viscerally. Nature was more a companion than a savior, more a guide than a god.

Companions, however, can often be fickle. What united Tyndall and Stephen was their willingness to listen to this aspect of the mountains as well, to include both nature's regularity and nature's chaos in their life ethic. That is, watching a sunset or overlooking a panoramic view does not lead, in and of itself, to a moral vision. Both Tyndall and Stephen were looking for more than that, for more than awe or beauty. In this sense, their approach to the mountains, as Lightman has suggested, was akin to what fellow evolutionary naturalist William K. Clifford referred to as "cosmic emotion." Lightman notes that this entailed "a sense of awe in regard to the order manifested throughout the universe."⁹¹ Yet, it also entailed a call to action, a guide for moral decision making. As Clifford wrote, "We are taught therein to look upon Nature as a divine Order or Cosmos, acting uniformly in all of its diverse parts; which order, by means of its uniformity, is continually educating us and teaching us to act rightly."⁹² Above all else, it was this teaching toward a justifiable ethic, ending in the call to act rightly, that created the significance of the cosmic order, what Tyndall and Stephen found through a cosmic emotion.

Cosmic emotion did not arise from simply the order in nature. It could not be found by studying nature's laws. Nature was not just "radiant and harmonious"; it was also "savage and chaotic."⁹³ Responding to Clifford's ideas about cosmic emotion, Frederic Harrison noted the important distinction between nature worshippers and truth seekers. The former sought beautiful vistas and panoramic views; the latter searched for deeper meaning and purpose. Tyndall and Stephen were seekers of truth.

The way that Tyndall, Stephen, and other scientific naturalists viewed the mountains has had considerable influence on how we view mountaineering today. High Alpine environments are not so much a place of escape as they are a place to explore one's inner self—not so much a place to get away, as a venue to get inside. Today's mountaineers seek answers, but they also relish the questions. It explains why they place themselves in danger, why they search out harrowing summits, and why they have such difficulty explaining their actions to nonclimbers. It also helps explain why climbers view their sport in such deeply personal terms, a moral quest as much as a physical one. Mountaineers speak reverently of what they call a "fellowship of the rope." That fellowship does not exist solely between roped partners, though that is how the phrase originated. It speaks to a sense of identity among all

mountaineers that arises from a shared experience of finding meaning in the mountains.

The fellowship that binds today's mountaineers had its origins in the mid-nineteenth century, in the writings of Tyndall, Stephen, and other pioneering alpinists. They were all nature worshippers, but most also aspired to be seekers of truth. Mountaineering as a sport was formed in the turbulent wake of evolutionary theory and the larger questions that it raised. For those Victorians who had experienced a crisis of faith, the dangerous Alpine environment offered a safe sanctuary. A surprising facet of Tyndall's *Hours of Exercise in the Alps* and Stephen's *The Playground of Europe*—both published in 1871, the same year as Darwin's *Descent of Man*—is the complete absence of anything that could be called religious. They are both perfectly and graciously secular. An identity thereby coalesced around both the sport and its practitioners. Alpinists could share in the experience of godliness without having to write about God. On the sides of mountains, in the midst of all God's wonders, it was safe to be an agnostic.

It should no longer be surprising, then, that most of the X Clubbers and prominent evolutionary naturalists found value in the mountains. Their shared experience in the mountains helped influence their common project of formulating an ethic based on nature rather than God. Naturalism for these intrepid mountain pioneers was infused with the Romantic notions of the sublime, influenced heavily by Humboldt's secular yet socially focused vision of how to act morally. These notions of the sublime lingered well into the nineteenth century through the writings of traveling naturalists in the Humboldtian tradition, including Hooker, Darwin, and others. They certainly were ever present in the mountaineering narratives of the Victorian era. By engaging with nature through sport, Tyndall and Stephen experienced the awe-inspiring beauty and unremitting chaos of the natural world, stripped of its natural theological connotations. Though they shared a desire to be the first on untrammelled Alpine peaks, they went to the mountains in search of something far more important. As clichéd as it may sound, their aim was always to find purpose and meaning. Thousands of pages of Tyndall's journals, volumes of Stephen's letters, and that is what you get.

Tyndall attempted to climb the Matterhorn a handful of times. He compared his third failed attempt, tellingly, as akin to "the breaking down of a religious faith."⁹⁴ But, finally, in August 1868, he stood on its very pinnacle. He was struck by the "inexorable decay" of its highest cliffs, and a queer sadness unexpectedly came over him. While on the summit, he pondered, "When I look at the heavens and the earth, at my own body, and my strength and

weakness of mind, even at these ponderings, I ask myself, Is there no being or thing in the universe that knows more about these matters than I do? What is my answer?"⁹⁵ Stephen had similar experiences. After a climb in 1873 with the painter Gabriel Loppé, Stephen penned perhaps his most famous passage, asking, "Does not science teach us more and more emphatically that nothing which is natural can be alien to us who are part of nature? Where does Mont Blanc end, and where do I begin?"⁹⁶ This is the essence of the cosmic emotion. For John Tyndall and Leslie Stephen, the questions that mountains force them to ask, whether through beauty or desolation, order or chaos, was the most important part of the mountaineering experience. They found morality mixed with the oxygen as they breathed in the answers. It was the main reason they went to the Alps.

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Notes

1. John Tyndall, Journals, 24 August 1856, Royal Institution of Great Britain, London. Hereafter cited as "Tyndall's Journals."
2. *Ibid.*, 12 August 1857.
3. *Ibid.*
4. *Ibid.*
5. The members of the X Club included Tyndall, Huxley, Hirst, J. D. Hooker, Edward Frankland, William Spottiswoode, Herbert Spencer, John Lubbock, and George Busk. See Ruth Barton, "John Tyndall, Pantheist: A Rereading of the Belfast Address," *Osiris*, 2nd ser., 3 (1987): 111–34.
6. Secondary material on Hirst is disparagingly sparse. His extensive journals housed in the Royal Institution of Great Britain, however, represent a potential gold mine for researchers interested in Victorian thought and culture. See William H. Brock and Roy M. MacLeod, eds., *Natural Knowledge in a Social Context: The Journals of Thomas Archer Hirst FRS* (London: Mansell, 1980); and Ruth Barton, "Hirst, Thomas Archer (1830–91)," *Dictionary of Nineteenth-Century British Scientists*, ed. Bernard Lightman, 4 vols. (Bristol, UK: Thoemmes Press, 2004), 2:973–77.
7. As quoted in Barton, "Hirst," 973.
8. As quoted in Brock and MacLeod, *Natural Knowledge*, 19, 15.
9. Michael S. Reidy, "From the Oceans to the Mountains: Spatial Science in an Age of Empire," in *Knowing Global Environments: New Perspectives on the Field Sciences*, ed. Jeremy Vetter,

- 21–48 (New Brunswick, NJ: Rutgers University Press, 2010); Michael S. Reidy, "The Rucksack of Joseph Dalton Hooker," *Alpinist Magazine* (2010–11): 83–86; and Richard Bellon, "Joseph Hooker Takes a 'Fixed Post': Transmutation and the 'Present Unsatisfactory State of Systematic Botany,' 1844–1860," *Journal of the History of Biology* 39 (2006): 1–39.
10. Colin A. Russell, *Edward Frankland: Chemistry, Controversy and Conspiracy in Victorian England* (Cambridge: Cambridge University Press, 1996), esp. 411–33; and Colin A. Russell, "Frankland, Edward (1825–1899)," in *Dictionary of Nineteenth-Century British Scientists*, 2:727–31. Tyndall and Frankland attended the University of Marburg together, where they both studied under Robert Bunsen. In 1862, Frankland accepted the professorship of chemistry at the Royal Institution, again working alongside Tyndall.
11. Russell, "Frankland," 729.
12. William Spottiswoode, "On Typical Mountain Ranges: An Application of the Calculus of Probabilities to Physical Geography," *Journal of the Royal Geographical Society*, 31 (1861): 149–54; Nicholas Wright Gillham, *A Life of Sir Francis Galton: From African Exploration to the Birth of Eugenics* (Oxford: Oxford University Press, 2001), 157–58; and Ruth Barton, "Spottiswoode, William (1825–1883)," in *Dictionary of Nineteenth-Century British Scientists*, 4:1889–91. Spottiswoode also joined Tyndall and Frankland as a member of the Royal Institution in 1864, becoming treasurer from 1865 to 1873 and honorary secretary from 1871 to 1878.
13. David Duncan, ed., *The Life and Letters of Herbert Spencer*, 2 vols. (London: Methuen, 1908), 1:497–99.
14. *Ibid.*, 2:231.
15. Following Bernard Lightman, the leading evolutionary naturalists of the period were Stephen, Tyndall, Huxley, Spencer, William K. Clifford, and William Pollock. All were either mountaineers or had spent some time in the Alps. See Bernard Lightman, "Robert Elsmere and the Agnostic Crisis of Faith," in *Victorian Faith in Crisis: Essays on Continuity and Change in Nineteenth-Century Religious Belief*, ed. Richard J. Helmstadter and Bernard Lightman (London: Macmillan, 1990), 292.
16. Joe D. Burchfield, "Tyndall, John (1820–93)," *Dictionary of Nineteenth-Century British Scientists*, 4:2053–58; Roy MacLeod, "Tyndall, John," in *Dictionary of Scientific Biography*, ed. Charles Coulston Gillispie, 16 vols. (New York: Charles Scribner's Sons, 1970–80), 13:521–24; Lord Schuster, "Tyndall as a Mountaineer," in *Life and Work of John Tyndall*, ed. A. S. Eve and C. H. Creasey, 340–92 (London: Macmillan, 1945); Michael S. Reidy, "John Tyndall's Vertical Physics: From Rock Quarries to Icy Peaks," *Physics in Perspective* 12 (2010): 122–45; and John Tyndall, "Life in the Alps: A Sketch by Professor Tyndall," Add.MS.53715/81, British Library, London.
17. Frederic William Maitland, *The Life and Letters of Leslie Stephen* (London: Duckworth, 1906), 143; and Alan Bell, "Stephen, Sir Leslie (1832–1904)," in *Oxford Dictionary of National Biography*, ed. H. C. G. Matthew and Brian Harrison, 60 vols. (Oxford: Oxford University Press, 2004), 52:448.
18. Maitland, *Life and Letters*, 88.
19. Bernard Lightman, *The Origins of Agnosticism: Victorian Unbelief and the Limits of Knowledge* (Baltimore: Johns Hopkins University Press, 1987), 153.
20. See Lightman, "Robert Elsmere and the Agnostic Crisis of Faith," 296.
21. Barton, "John Tyndall, Pantheist," 121.
22. See, for example, Tyndall's Journals, 25 July 1857.
23. Leslie Stephen, *The Playground of Europe* (London: Longmans, Green, 1871), 296. Many writers in the nineteenth century, including W. K. Clifford, suggested that such an embracement of danger related directly to the struggle that agnostics confronted with end of life. See "The Un-

seen Universe," in *Lectures and Essays, by the Late William Kingdon Clifford*, ed. Leslie Stephen and Frederick Pollock, 161–79 (London: Macmillan, 1886).

24. Eve and Creasey, *Life and Work*, 113.

25. As George Levine has argued, Victorian evolutionary naturalists believed that the epistemology of science required intellectual sacrifice; they gave up orthodox beliefs to get at the truth. Here, evolutionary naturalists are purposefully experiencing physical sacrifices to encounter truths about life and death. See George Levine, *Dying to Know: Scientific Epistemology and Narrative in Victorian England* (Chicago: University of Chicago Press, 2002).

26. Stephen, *Playground of Europe*, 108.

27. Bruce Hevly, "The Heroic Science of Glacier Motion," *Osiris*, 2nd ser., 11 (1996): 66, 84.

28. Tyndall's Journals, 4 August 1857.

29. *Ibid.*, 13 July 1858.

30. Stephen, *Playground of Europe*, 121.

31. John Tyndall, *Mountaineering in 1861: A Vacation Tour* (London: Longman, Green, Longman, and Roberts, 1862), 33.

32. Tyndall, *Hours of Exercise in the Alps* (London: Longmans, Green, 1871), 370.

33. Leslie Stephen, trans., *The Alps; or, Sketches of Life and Nature in the Mountains by H. Berlepsch* (London: Longman, Green, Longman, and Roberts, 1861), 16.

34. This was especially true for biogeographers, from Hooker to Darwin to Alfred Russel Wallace. See Michael S. Reidy, "From the Oceans to the Mountains: Spatial Science in an Age of Empire," in *Knowing Global Environments: New Perspectives on the Field Sciences*, ed. Jeremy Vetter, 21–48 (Piscataway, NJ: Rutgers University Press, 2010).

35. Stephen, *Playground of Europe*, 295.

36. Tyndall's Journals, 4 August 1861.

37. *Ibid.*, 9 August 1857.

38. John Tyndall, *Faraday as a Discoverer* (New York: D. Appleton, 1868), 185.

39. Michael S. Reidy, "John Tyndall's Vertical Physics"; Ruth Barton, "John Tyndall (1820–1893)," in *Dictionary of Nineteenth Century British Philosophers*, ed. W. J. Mander and Alan P. F. Sell, 2 vols. (Bristol, UK: Thoemmes Press, 2002), 2:1137; and "Professor Tyndall and the Scientific Movement," *Nature* 36 (1887): 217.

40. John Tyndall, "On the Study of Physics," in *Fragments of Science*, 6th ed., 2 vols. (London: Longmans, Green, 1892), 1:282.

41. Tyndall's Journals, 18 August 1861. The entry, though dated 18 August, was written on 21 August about his experiences on 19 August, the day of the first ascent of the Weisshorn.

42. Bell, "Stephen," 447.

43. Stephen represents merely one example of a student who purposefully mingled athleticism and mathematical studies in Cambridge. For the intense connection between rigorous athletic training and the similarly "tough regime of disciplined learning" involved in 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, 288–323 (Chicago: University of Chicago Press, 1998).

44. For Leslie Stephen's life, see Noel Annan, *Leslie Stephen: The Godless Victorian* (Chicago: University of Chicago Press, 1984); Maitland, *Life and Letters*; and Bell, "Stephen."

45. Maitland, *Life and Letters*, 80–81. They succeeded in their second attempt, having been rebuffed earlier by bad weather.

46. Lightman, "Robert Elsmere and the Agnostic Crisis of Faith," 283.

47. Annan, *Godless Victorian*, 2.

48. Stephen, *Alps*, 263.

49. *Ibid.*, 263–64.

50. Stephen, *Playground of Europe*, 38–39.

51. Ruth Barton, "An Influential Set of Chaps: The X-Club and Royal Society Politics, 1864–85," *British Journal for the History of Science* 23 (1990): 53–81.

52. Stephen, *Playground of Europe*, 45.

53. *Ibid.*, 66, 65.

54. *Ibid.*, 68.

55. *Ibid.*, 180.

56. *Ibid.*

57. *Ibid.*, 93.

58. *Ibid.*, 104.

59. *Ibid.*, 108.

60. *Ibid.*, 196.

61. *Ibid.*, 276.

62. *Ibid.*, 277.

63. *Ibid.*, 292.

64. *Ibid.*, 282.

65. *Ibid.*, 292.

66. Annan, *Godless Victorian*, 92.

67. Maitland, *Life and Letters*, 97.

68. The "bold man" was John Tyndall. In July 1872, Tyndall became embroiled (anonymously at first) in what was soon referred to as the "Prayer-Gauge Debate." In defending the need for a rational and experimental verification of prayer, he poked fun at the religious fervor of the day. Here, Stephen is poking fun at Tyndall. Leslie Stephen, "A Bad Five Minutes in the Alps," in *Essays on Freethinking and Plainspeaking* (New York: G. P. Putman's Sons, 1905), 179.

69. *Ibid.*, 184.

70. *Ibid.*, 186.

71. *Ibid.*, 189.

72. *Ibid.*, 196.

73. *Ibid.*, 200.

74. *Ibid.*, 201.

75. *Ibid.*, 208.

76. *Ibid.*, 210. Here, and elsewhere, Stephen referred to Darwin as he contemplated death. In a letter to Charles Norton, for instance, Stephen noted that while Montaigne had taken consolation from Lucretius when contemplating the end of his own existence, he (Stephen) took his own consolation from Darwin. As David Amigoni noted, "Stephen was claiming Darwin as a guide to action, or rather resignation, in the present, and situating him authoritatively in a tradition of rational thought about death." David Amigoni, "Proliferation and Its Discontents: Max Muller, Leslie Stephen, George Eliot and *The Origin of Species* as Representation," in *Charles Darwin's "The Origin of Species": New Interdisciplinary Essays*, ed. David Amigoni and Jeff Wallace (Manchester, UK: Manchester University Press, 1995), 124.

77. Stephen, "Bad Five Minutes," 214.

78. *Ibid.*

79. *Ibid.*, 225. In case there was any doubt, Stephen added an endnote to his text: "It may be

as well to say, for the credit of the noble science of mountaineering, that the foregoing narrative is without even a foundation in fact." Ibid.

80. Annan, *Godless Victorian*, 91.

81. As quoted in Maitland, *Life and Letters*, 89.

82. Stephen, *Playground of Europe*, 107.

83. Past scholars have argued that these words led Tyndall to resign from the Alpine Club. See Annan, *Godless Victorian*, 91; Eve and Creasey, *Life and Work*, 389; and Fergus Fleming, *Killing Dragons: The Conquest of the Alps* (New York: Grove Press, 2000), 212. Yet, Catherine Hollis has recently shown that Stephen first made these remarks in 1865, three years after Tyndall resigned. See Catherine W. Hollis, *Leslie Stephen as Mountaineer: "Where does Mont Blanc end, and where do I begin?"* (London: Cecil Woolf, 2010), 35.

84. Lightman, "Robert Elsmere and the Agnostic Crisis of Faith," 299.

85. Lightman, *Origins of Agnosticism*, 149–50.

86. As quoted in Maitland, *Life and Letters*, 79; and Bell, "Stephen," 448.

87. Barton, "John Tyndall: Pantheist," 129–30; and Lightman, *Origins of Agnosticism*, 150.

88. Lightman, *Origins of Agnosticism*, 150.

89. As quoted in Maitland, *Life and Letters*, 104.

90. Tyndall's Journals, 18 July 1857.

91. Lightman, "Robert Elsmere and the Agnostic Crisis of Faith," 300.

92. Stephen and Pollock, *Lectures and Essays*, 404–5.

93. "Cosmic Emotion," *New York Times*, 28 August 1881. This is a short summary of Frederic Harrison, "Pantheism and Cosmic Emotion," *Nineteenth Century* 10 (1881): 284. Harrison wrote it as a reply to "a most interesting paper contributed by the late Professor W. K. Clifford and discussed at the Metaphysical Society." See Frederic Harrison, *The Creed of a Layman: Apologia Pro Fide Mea* (London: Macmillan, 1907), 194.

94. Tyndall, *Hours of Exercise*, 123.

95. As quoted in Eve and Creasey, *Life and Work*, 384; and Tyndall, *Hours of Exercise*, 292.

96. Leslie Stephen, "Sunset on Mont Blanc," *Cornhill Magazine* 28 (1873): 458. For an enlightening analysis of this and other passages from Stephen's mountaineering publications, see Hollis, *Leslie Stephen as Mountaineer*.