Acta Universitatis Wratislaviensis No 3998
Anglica Wratislaviensia LVIII, Wrocław 2020
https://doi.org/10.19195/0301-7966.58.1

Ilona Dobosiewicz
ORCID: 0000-0001-7259-2891
University of Opole
ildob@uni.opole.pl

"The wrathful sunset glared…": The Krakatoa Sunsets in Victorian Science and Art

Abstract: The eruption of Krakatoa on August 27, 1883 was an event both tragic and spectacular. Thousands of lives were lost; sea waves and atmospheric disturbances were detected around the globe. Billions of tons of volcanic ash were thrown into the atmosphere producing multi-coloured sunsets caused by the scattering of light by aerosol particles. The paper discusses the ways in which these so-called Krakatoa sunsets, which were experienced by most of the world, were reflected in Victorian scientific and artistic discourse. The accounts included in the section "Descriptions of the Unusual Twilight Glows in Various Parts of the World, in 1883–84" of the Royal Society report The Eruption of Krakatoa and Subsequent Phenomena (1888), and selected poems by Alfred Tennyson, Charles Algernon Swinburne, Robert Bridges, and Mathilde Blind are analyzed to trace Victorian responses to the remarkable optical effects of the Krakatoa eruption.

Keywords: Krakatoa eruption, Royal Society report, Victorian poetry

The eruption of Krakatoa, the volcano, also known as Krakatau, on a small island located between Java and Sumatra, which took place on August 27, 1883 was a tragic event. Nearly forty thousand people had been killed by a series of tsunamis that almost completely destroyed the port of Anjer on Java and more than a hundred towns and villages on the coast. The estimates of the actual height of the wave range from 50 to 100 or even 135 feet (Simkin and Fiske 15). Approximately two-thirds of the island of Krakatoa disappeared (Symons 23), most probably by collapsing into a cavity created by the eruption of pumice (Simkin and Fiske 18). The dust cloud produced by the eruption left in darkness areas as far as 130 to 150 miles away from the site of the eruption (Symons 26–27). The darkness was complete in places located within a radius of 50 miles and it lasted for two days (Thornton 29). The sound produced by the eruption was audible from over 4,000 kilometres away, which is considered to be the furthest-travelling audible sound in recorded history. The explosion raised water levels as far away as France. It has been determined that

such effects of the Krakatoa eruption as sea waves and atmospheric disturbances were detected around the whole world. The force of the eruption was more than ten thousand times that of the atomic bomb dropped on Hiroshima (Thornton 1). The eruption became one of the first major events in the colonial world to be immediately reported back to Europe. Richard Hamblyn points out that the "instantaneity of the telegraph reports creat[ed] an entirely new category of disaster: the universal news event, a story followed, in the case of Krakatau, by more than half of the world's population" (179).

Tom Simkin and Richard S. Fiske, in their centennial review of the impact of the Krakatoa eruption, published by the Smithsonian, quote some of the telegrams sent from Batavia, and draw attention to their "terse eloquence" (15):

> Noon. —Serang in total darkness all morning—stones falling. Village near Anjer washed away. Batavia now almost quite dark—gas lights extinguished during the night—unable communicate with Anjer—fear calamity there—several bridges destroyed, river having overflowed through rush sea inland. (qtd. in Simkin and Fiske 14)

A telegram sent on August 28, 1883 reads: "Where once Mount Krakatau stood the sea now plays" (qtd. in Simkin and Fiske 14). What makes these telegrams extraordinary is the figurative language which conveys the sense of horrific catastrophe by juxtaposing the noon, the time of day associated with light, with the image of Serang shrouded in total darkness and by personifying the sea which "now plays" at the site of the destroyed Mount Krakatau, as if the Mount disappeared without a trace. One gets a sense that the senders of the above messages had been striving to find new ways of communicating the unprecedented horror of the eruption.

In January 1884, the Royal Society, under the leadership of its president Thomas Henry Huxley, appointed a special committee to collect and organize all available information and scientific commentary on the Krakatoa eruption in order to "best provide for their preservation, and promote their usefulness" (Symons iii). In keeping with the British tradition of informed amateurism in the sciences, the committee placed an advertisement in the London *Times* in February 1884 asking the public for "authenticated facts" and published papers relating various phenomena associated with the explosion. Having received a great number of reports both from scientists and amateur observers, the committee spent 28 months analyzing the accounts and producing the final report, edited by the committee's chairman, G. J. Symons (Symons vi). The report covers such topics as drifts of pumice, changes in barometric pressure and sea level, places where explosions were heard and unusual optical effects in the atmosphere (Symons iv). The Royal Society report incorporates the materials gathered by the Royal Meteorological Society which appointed its own committee "to investigate the cause of remarkable sunrises and sunsets, and had already issued circulars of inquiry over the greater part of the globe" and handed over the data to the Krakatoa committee (Symons iv). The following paper will discuss the ways in which these unusual optical effects were represented in Victorian scientific and artistic discourses.

The volcano jettisoned huge amounts of ash and debris into the stratosphere, and a vast cloud of volcanic ash, estimated at approximately 70,000 cubic metres, started to circle the globe, spreading steadily westward and northward. The aerosol ash particles in the Earth's upper atmosphere produced spectacular visual effects: intense and long lasting red sunsets, a blue or green tinge to the sun and moon, and a large corona-like haze around the sun. These extraordinary effects, such as magnificent fiery sunsets, were visible all over Europe between October and December 1883, with some recurrences in 1884. The already-mentioned report of the Royal Society, which was published in 1888 devoted more than 300 pages to "Unusual Optical Phenomena of the Atmosphere", with a section gathering the "Descriptions of the Unusual Twilight Glows in Various Parts of the World, in 1883–84". This section was based on the data gathered by the Royal Meteorological Society in response to the already mentioned circulars which did not make a connection between the unusual sunsets and the events of August 27, 1883. Although the eruption of Krakatoa was the first major disaster to take place after the laying of transoceanic telegraph cables and thus was widely reported in England almost immediately after the explosion (Winchester 181), observers did not realize that the remarkable sunsets were an aftermath of the volcanic eruption. The correspondents whose descriptions of sunrises and sunsets sent to the Royal Meteorological Society included in the Royal Society report speculated that the sunsets might have been caused by a meteoric cloud in space or by a tail of a great comet.

Although the authors of accounts included in the Royal Society report offered different hypotheses about the reasons for the unusual sunsets, they shared an awareness that they became witnesses of extraordinary phenomena. As pointed out by Richard D. Altick, "in their attempts to describe the brilliant celestial displays, the observers often abandoned scientific terminology in favour of a descriptive style that can only be called lyric" (251). The report is now in the public domain, available online in its entirety. The examples of such descriptive passages can be easily found there. To quote just a few: H. Parker, referring to "the various phenomena seen in Ceylon in September, 1883" writes:

> For several evenings previous to the first green appearance of the sun (September 9) we had magnificent sunsets, the sky in particular being of the most peculiar and varying shades and colours, in which delicate, beautiful, blue-and-reddish-purple predominated, more like the aurora borealis, but brighter and deeper in tone than any I have seen in the atmosphere. (Symons 155)

The use of such adjectives as *magnificent*, *delicate*, or *beautiful* departs from the conventions of scientific reports that avoid subjectivity and are generally characterized by the parsimonious use of adjectives, especially evaluative ones.

Another passage that borders on the lyrical is by L. Layard from New Caledonia, who depicts the sunset in the following way:

> As soon as the sun's disc has disappeared, a glow comes up from the west like that of white-hot steel, reddening somewhat as it mounts to the zenith, but changing the while to blue. From the zenith it passes into the most exquisite green, deepening as it loses itself in the east. As the sun sinks

lower and lower, the red tints overpower the white-hot steel tints, and the blue of the zenith those of the green. At 7 p.m. … nearly the entire western half of the horizon has changed to a fiery crimson … . I have been attempting to describe one of our cloudless evenings, … but who shall paint the glory of the heavens when flecked with clouds?—burnished gold, copper, brass, silver, such as Turner in his wildest dreams never saw, and of such fantastic forms! (Symons 173)

Becoming aware of the limitations of language in conveying the unprecedentedly rich visual phenomena he witnessed, Layard turns to art, evoking William Turner, whose stunning images reflect the spectacular sunsets observable in Europe after the 1815 eruption of the Tambora volcano in Indonesia. Turner, who passed away in 1851, could not paint the Krakatoa sunsets, but other visual artists came up with the works depicting unusual afterglows. An American landscape painter, Frederic Edwin Church, travelled to Ontario to capture the optical contrast between the ice-bound lake and the fiery sunset. His watercolour painted on December 28, 1883, called "Sunset over the Ice of Chaumont Bay, Lake Ontario" was created in the immediate aftermath of the eruption. An English painter, William Ascroft, spent many evenings frantically sketching changing light patterns of the setting sun, using chalk pastels. The frontispiece to the Royal Society's Krakatoa report reproduces his six sketches "made on the bank of the Thames, a little west of London, on the evening of November 26, 1883", which "represent the general colouring of the western sky from shortly after sunset (3 h 57 m. p.m.) to the final dying out of the after-glow at about 5.15 p.m." (Symons n.p.). Ascroft produced over a thousand of these pastels, and in 1888 five hundred and thirty sketches were exhibited in the galleries of the South Kensington Museum (now the Science Museum). It is worth mentioning that early stages of the eruption were captured in a photograph taken on May 27, 1883, later redrawn and coloured, and published in the Royal Society report of the event

Interestingly, one of the best-known paintings—an iconic symbol of anxiety—Edvard Munch's *The Scream* (1893) was inspired by the Krakatoa sunset. Donald W. Olson, a physics and astronomy professor, and Russell O. Doescher and Marilynn S. Olson from the English Department at Texas State University, analyzed Munch's journal entries, conducted topographic analysis and determined that it was the eruption of Krakatoa that produced the fiery twilights. Munch writes in his journal:

I was walking along the road with two friends—then the Sun set—all at once the sky became blood red—and I felt overcome with melancholy. I stood still and leaned against the railing, dead tired—clouds like blood and tongues of fire hung above the blue-black fjord and the city. My friends went on, and I stood alone, trembling with anxiety. I felt a great, unending scream piercing through nature.

The image of the sky stayed with Munch for a long time. In another journal entry he provided more details about the location and the remarkable colours:

One evening I was walking out along a mountain road near Christiania [now Oslo]—together with two companions … the Sun went down … it was as if a flaming sword of blood slashed open the vault of heaven—the atmosphere turned to blood—with glaring tongues of fire—the hills be-

came deep blue—the fjord shaded into cold blue—among the yellow and red colours—that garish blood-red—on the road—and the railing—my companions' faces became yellow-white—I felt something like a great scream—and truly I heard a great scream. (qtd. in Doescher, Olson and Olson 30)

Doescher and the Olsons established that Munch's words refer to the Krakatoa sunsets which were visible at Christiania's high northern latitude.

Some of the most vivid verbal depictions of the Krakatoa sunsets come from Gerald Manley Hopkins, yet they can be found not in his poetry, but in the piece he sent to the scientific journal *Nature*. Hopkins observed and made notes on the unusual sunsets and afterglows throughout October, November and December of 1883, and at the end of December he combined his observations into an extensive, 2000-words long letter which was published in the January 3, 1884 edition of the journal (the whole edition has been digitalized and is available at archive.org). Like many other observers of the extraordinary spectacle, he did not know the reason for the unusual optical phenomena—in 1883 scientists speculated that they might have been caused by a variety of meteorological factors, and only a few thought that they might have been caused by the Krakatoa eruption. One of them was the founding editor of *Nature*, J. Norman Lockyer, who concluded his article published in the December 8, 1883 edition of the London *Times* with an observation that "although *à priori* it seems difficult to imagine that a sunset in London in December should owe its coloration to a volcanic eruption which took place many thousand miles away last August, inquiries along several lines based upon the evidence now available really lend great probability to this view" (10). However, he suggested that more evidence needed to be collected and other hypotheses tested. *Nature* printed Hopkins' report in the section entitled "The Remarkable Sunsets" which contained several "communications" by authors located in Britain, and on the Continent. Hopkins' letter was also summarized in the Royal Society Report.

What strikes the reader of Hopkins' letter is his seamless blending of scientific discourse and aesthetic perception of the observed phenomena. He maintains that he wants to contribute to "the body of evidence" concerning the sunsets, and expresses his conviction that they "do need some explanation" (222). In a manner befitting a Victorian scientist, he attempts to find some order beneath the observed phenomena, to classify their most salient characteristics. On the basis of his observations, he came up with the following features of "the remarkable sunsets":

(1) These sunsets differ from others, first in their time and their place or quarter … . (2) They differ in their periodic action or behaviour.… (3) They differ in the nature of the glow, which is both intense and lusterless … . (4) They differ in the regularity of their colouring … . (5) They differ in the colours themselves, which are impure and not of the spectrum … . (6) They differ in the texture of the coloured surfaces, which are neither distinct cloud of recognized make nor yet translucent mediums. (222–23)

Hopkins concludes his report with a detailed description of the sunset he witnessed on December 16, 1883. He conveys his empirical observations, which combine spatial and temporal details, in a language both precise and full of poetic intensity:

> Above the green in turn appeared a red glow, broader and burlier in make; it was slowly brindled, and in the ribs or bars the colour was rosier, in the channels where the blue of the sky shone through it was a mallow colour. Above this was a vague lilac. The red was first noticed at 45° above the horizon, and spokes or beams could be seen in it, compared by one beholder to a man's open hand. By 4.45 the red had driven out the green, and, fusing with the remains of the orange, reached the horizon. By that time the east, which had a rose tinge, became of a duller red, compared to sand; according to my observation, the ground of the sky in the east was green or else tawny, and the crimson only in the clouds. A great sheet of heavy dark cloud, with a reefed or puckered make, drew off the west in the course of the pageant: the edge of this and the smaller pellets of cloud that filed across the bright field of the sundown caught a livid green. At 5 the red in the west was fainter, at 5.20 it became notably rosier and livelier; but it was never of a pure rose. A faint dusky blush was left as late as 5.30 or later. While these changes were going on in the sky, the landscape of Ribblesdale glowed with a frowning brown. (223)

As Thomas A. Zaniello maintains, such passages "reveal Hopkins' facility with both scientific detail and the painter's palette" and "indicate a sensibility attempting to render the phenomena of the world without forcing a distinction between science and art" (261). It has been pointed out that Hopkins' letter uses imagery and diction found in his poems: for example, the "softly brindled" red glow brings to mind the lines: "glory be to God for dappled things—/ For skies of couple colour as a brinded cow" from his 1877 poem "Pied Beauty"; brinded being the more archaic form (Morgan 5). Another passage form Hopkins' letter published in *Nature* which makes the reader think not only of "Pied Beauty" but also "The Windhover" reads:

> A bright sunset lines the clouds so that their brims look like gold, brass, bronze, or steel. It fetches out those dazzling flecks and spangles which people call fish-scales. It gives to a mackerel or dappled cloud rack the appearance of quilted crimson, or a ploughed field glazed with crimson ice. These effects may have been seen in the late sunsets, but they are not the specific after-glow; that is, without gloss or lustre. (222–23)

Hopkins compares the sky at sunset to "a ploughed field" which reminds one of line 5 of "Pied Beauty": "Landscape plotted and pieced—fold, fallow, and plough" of the image from "The Windhover": "sheer plod makes plough down million / Shine" (lines 12–13). Patricia Ball points out that Hopkins' letter uses "turn of phrase or analogy and a choice of words that are characteristic of him", but they "serve the purpose to which the whole correspondence is directed, the accurate plotting of remarkable skyscapes" (116).

The Krakatoa sunsets found their way into the works of other Victorian poets. Alfred Tennyson observed them at his residence at Aldworth, Surrey. Tennyson's 1892 poem "St. Telemachus" contains the description of the fiery sunset based on the poet's recollection of the Krakatoa afterglows, and the imagery of the poem resonates with different features of the Krakatoa sunsets. As the poet explains in his note, the opening lines of "St. Telemachus" were "suggested by the memory of the eruption of Krakatoa" (227). Tennyson writes:

> Had the fierce ashes of some fiery peak
> Been hurl'd so high they range around the globe?

For day by day, through many a blood-red eve,
In that four-hundredth summer after Christ
The wrathful sunset glared against a cross
Reared on the tumbled ruins of an old fane
No longer sacred to the Sun, and flamed
On one huge slope beyond … (lines 1–8)

Simon Winchester noted that numerous observers found the Krakatoa sunsets "almost apocalyptic, often unnerving", and Tennyson's phrases "blood-red" and "wrathful" evoke such qualities. The hero of the poem, due to divine inspiration, decides to walk to the Roman Colosseum to stop the fight of the gladiators, but is stoned to death by the crowd gathered there. When the news of Telemachus's death reaches the Emperor Honorius, he orders an end to the gladiatorial combat. Tennyson depicts Telemachus in the evening when the fane was: "Bathed in that lurid crimson—asked 'Is earth / On fire to the West? Or is the Demon-god / Wroth at his fall?…" (lines 18–20). The questions reflect a popular reaction to the red sunsets which were frequently mistaken for a distant conflagration—the word "conflagration" was repeatedly used in the Royal Society Report, which contains numerous comparisons of the afterglows to an immense fire. At the same time, they suggest a turning point in Western history—the transition from paganism ("Demon-god") to Christianity.

The memory of the remarkable sunset had stayed with Tennyson for nine years before it became artistically transformed in his 1892 poem. Other poets created more immediate—if perhaps less aesthetically rewarding—responses to the Krakatoa sunsets. One of them was Charles Algernon Swinburne, who in his 1884 "A New-Year Ode: to Victor Hugo" from the volume *A Midsummer Holiday and Other Poems* uses images inspired by a particularly vivid sunset on November 25, 1883, considered to be one of the most spectacular Krakatoa afterglows. The poem is a tribute to the French writer, whom Swinburne admired and considered his literary master, and it celebrates the completion of the last series of Hugo's epic masterpiece, *The Legend of the Ages*. Swinburne wrote to his mother, in a January 25, 1884 letter, that he wanted to honour:

the still increasing glories and varying beauties of … [Hugo's] work, which if possible grows more splendid and wonderful as the sunset draws nearer … . Of course you see the allegory that was at once suggested to me on looking at that glorious transfiguration of the sky a little before the sun set, which made everything above and around more splendid than ever it was at morning or at noon. (Leith 68–69)

The ode consists of twenty-five stanzas, six of which, from stanza XVII to XXII contain Swinburne's impressions of the sunset which abound in imagery associated with flames, fire and depict unusual colours of the clouds and the sky. To quote just a few examples: in stanza XVII, Swinburne writes of clouds "full-fledged with plumes of tawny fire and hoar grey light"; in stanza XVIII the reader comes across the image of "heaven, manifest in manifold / Light of pure pallid am-

ber, cheered with fire of gold"; and in stanza XIX the poet makes reference to the green tinge of the sky—a phenomenon associated with the Krakatoa sunset: "And where the fine gold faded all the sky / Shone green as the outer sea when April glows" (online). Throughout the poem, Swinburne repeatedly uses imagery associated with sunsets, storms, and fire to represent the times Hugo portrayed in his works as well as the era when he lived.

Another Victorian poet who employed imagery influenced by the Krakatoa sunsets was Robert Bridges. His 1885 narrative poem *Eros and Psyche* includes a two-stanza description of a sunset:

> Fair was the sight; for now though full an hour
> The sun had sunk she saw a wondrous light
> In shifting colour to the zenith tower,
> And grow more gorgeous ever and more bright.
> Bathed in the warm and comfortable glow,
> The fair delighted queen forgot her woe,
> And watched the unwonted pageant of the night.
>
> Broad and low down, where last the sun had been,
> A wealth of orange gold was thickly shed,
> And touching that a curtain pale of green,
> Like apples are before their rinds grow red:
> Then to the height the variable hue
> Of rose and pink and crimson freaked with blue,
> And olive-bordered clouds o'er lilac led. (stanzas 24 and 25)

Many phenomena described in the Royal Society's Krakatoa reports find their poetic representation in Bridges's stanzas which depict the persistence of luminosity after the sunset, the variation and gradation of the sky colours, and the greenish moon. Richard Altick has commented on the similarities between Bridges's poem and Hopkins' letter printed in *Nature*, pointing out that colours are designated in the same terms and arranged in the same order. He calls the above passage from Eros and Psyche "hardly more than a versification of certain elements of Hopkins' prose picture" (256). Hopkins himself felt that his observations appeared to have been appropriated by Bridges, and he wrote to the poet: "The description so closely agrees with an account I wrote in *Nature*, even to details which were local only, that it is very extraordinary: you did not see my letter, did you?" (Abbott 202).

The poet who by the very titles of her works acknowledges that their imagery had been inspired by the Krakatoa sunsets is Mathilde Blind, who wrote two sonnets, both entitled "The Red Sunsets, 1883" which were originally published in her 1889 volume *The Ascent of Man* and then reprinted in an 1893 edition of her *Songs and Sonnets*. The first sonnet contains the following lines:

> A pure expense of rose-flushed violet glowed
> And, kindling into crimson light, o'erflowed
> The hurrying wrack with such a blood-red glare,

That heaven, igniting, wildly seemed to flare
On the dazed eyes of many an awe-struck crowd. (104)

The colours evoked by Blind bring to mind Hopkins' letter to *Nature* as well as the accounts included in the Royal Society report. Various shades of red and lilac are mentioned in all the texts. Blind's second sonnet with the identical title "The Red Sunsets, 1883" describes the evening haze that was another prominent feature of the Krakatoa sunsets: "The twilight heavens are flushed with gathering light, / And o'er wet roofs and huddling streets below / Hang with a strange Apocalyptic glow" (105). Both the colors and the date of the Krakatoa eruption invoked in the title may be read as intimations of the incoming apocalypse.

Discussing Victorian responses to the Krakatoa sunsets one should remember that the immediate after-effects of the Krakatoa eruption were disastrous: thousands of lives were lost; whole communities were destroyed. The physical and psychological horrors of the cataclysmic disaster were described in numerous articles and tragic tales of the survivors, most of whom were aboard ships passing the Sunda Strait, which were published in the international press. However, certain aftereffects of the explosion, which took place in locations far away from the island, gave rise to unexpected outcomes. The spectacular red sunsets observed around the globe in the aftermath of the catastrophic event brought about an interesting blurring of the boundaries between scientific and poetic discourses, with witnesses trying to find fitting ways to grapple with the unusual optical phenomena. The fiery skies inspired painters, poets but also scientists and ordinary observers who felt compelled to give testimonies to what they saw, searching for a fresh language to convey their extraordinary experiences. One might argue that such aestheticization of the aftermath of a highly traumatic event may trivialize the suffering of its victims. Yet, the works of art inspired by the Krakatoa sunsets, regardless of a moral and aesthetic anxiety they cause, are worthy of critical attention. They may be seen as an example of cross-fertilization between Victorian science and art because—together with the Royal Society report—they have become a kind of scientific record of Nature's fury. The poems by Tennyson, Bridges, Swinburne and Blind and scientific reports that do not shy away from poetic language attest to strong connections between nature on the one hand, and art and science on the other. The discourses of science and art had become intertwined through the attempts of authors to convey the shared experience of the fiery Krakatoa sunsets. In a tragic twist of fate, the deadliest volcanic explosion of the 21st century was that of Anak Krakatau (Child of Krakatau), which emerged in the caldera formed by the 1883 Krakatoa eruption. Anak Krakatau erupted on December 22, 2018, causing a tsunami which killed 437 people.

References

Abbott, C. C. (ed.). 1935. *The Letters of Gerald Manley Hopkins to Robert Bridges*. London: Oxford UP.

Altick, R. 1960. "Four Victorian Poets and an Exploding Island." *Victorian Studies* 3.3. 249–60.

Ball, P. M. 1971. *The Science of Aspects: The Changing Role of Fact in the Work of Coleridge, Ruskin, and Hopkins*. London: Athlone.

Blind, M. 1893. "Red Sunsets, 1883." In: *Songs and Sonnets*. London: Chatto and Windus, 104–105. Retrieved from Victorian Women Writer Project. indiana.edu/vwwp. 15 May 2019.

Bridges, R. 1885. *Eros and Psyche. A Poem in Twelve Measures*. London: George Bell and Sons. Retrieved from www.archive.org. 15 May 2019.

Doescher, R. L., D. W. Olson and M. S. Olson. 2004. "When the Sky Ran Red: The Story behind *The Scream*." *Sky & Telescope* 107. 28–35.

Hopkins, G. M. 1884. "The Remarkable Sunsets." *Nature*. 3 Jan. 1884. Retrieved from www.archive.org. 10 May 2019.

Hamblyn, R. 2009. *Terra, Tales of the Earth: Four Events that Changed the World*. London: Picador.

Leith, D. (ed.). 1917. *The Boyhood of Algernon Charles Swinburne; Personal Recollections by His Cousin Mrs. Disney Leith. With extracts from Some of His Private Letters.* London: Putnam.

Lockyer, J. N. 1883. "The Recent Sunrises and Sunsets." *Times*, 8 Dec. 1883. 10.

Morgan, M. R. 2013. "The Eruption of Krakatoa (also known as Krakatau) in 1883." *BRANCH: Britain, Representation and Nineteenth-Century History*. Ed. Feluga, D. F. Extension of *Romanticism and Victorianism on the Net*. 19 Aug. 2018.

Swinburne, A. C. 1884. "A New-Year Ode to Victor Hugo". Retrieved from www.fleursdumal.nl. 2 Mar. 2019.

Simkin, T. and R. S. Fiske. 1983. *Krakatau 1883: The Volcanic Eruption and Its Effects*. Washington: Smithsonian Institution P.

Symons, G. J. (ed.). 1888. *The Eruption of Krakatoa, and Subsequent Phenomena: Report of the Krakatoa Committee of the Royal Society*. London: Trübner. Retrieved from Google Books. 20 Aug. 2018.

Tennyson, A. 1987. "St. Telemachus." In: Richs, Ch. (ed.). *The Poems of Tennyson*. 2nd ed. Vol. 3. Berkeley: U of California P, 224–27.

Thornton, I. 1996. *Krakatau: The Destruction and Reassembly of an Island Ecosystem*. Cambridge: Harvard UP.

Winchester, S. 2003. *Krakatoa, The Day the World Exploded: August 27, 1883*. New York: Harper Collins.

Zaniello, T. A. 1981. "The Spectacular English Sunsets of the 1880s." *Victorian Science and Victorian Values: Literary Perspectives*. Eds. Paradis, J. and T. Postlewait. Special issue of *Annals of the New York Academy of the Sciences*. 247–67.