"Looking Downward Thence": D. G. Rossetti's "The Blessed Damozel" in Astronomical Focus

Look again at that dot. That's here. That's home. That's us. On it everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives.

—Carl Sagan, *Pale Blue Dot: A Vision of the Human Future in Space* (1994)

<Abstract>

This essay explores astronomical science in D. G. Rossetti's poem "The Blessed Damozel" and his painting of the same title. By attending to topical references to astronomy, we can see Rossetti engaging with contemporary debates about vision, indeterminacy, and the place of Earth in the cosmos. Not merely an allegorical scaffolding for the poem's meditation on enduring love, distance, and eternity, space as conceived by Rossetti in these works becomes part of a complex thought experiment about the individual's experience of separation and isolation in a universe the scale of which Victorians were racing to assess and comprehend with their burgeoning technologies and theories. By imagining the Damozel in relation to these technologies and the picture of the heavens they were beginning to unveil, as well as by demonstrating how Rossetti appears to anticipate theories of time and distance that would coalesce in the two or three decades after his death, we see the poet-painter using a demonstrably Victorian form of imaginative science to understand how knowing and looking were poised to change radically at the end of the nineteenth century.

<Essay Text Begins Here>

Dante Gabriel Rossetti's poem "The Blessed Damozel," first published in the PRB organ *The Germ* in 1850 (later in his *Poems* of 1870), and his painting of the same title, commissioned in 1871 and worked up between 1875 and 1878, are among his best-known works. Both foreground the act of looking, particularly how one looks *thence*: from a place or as a consequence of something. Looking, as we will see, is complicated considerably by the astronomical distances and temporalities against which Rossetti imagines the Damozel and her Earth-bound lover. Across the vastness of space, the lovers experience a confusing stretching and compacting of time that resonates with contemporary understandings of the cosmos. In giving expression to their complicated dilation of viewing, Rossetti offers imaginative explanations for some of the peculiarities of spacetime that would find theoretical expression not long after his death in 1882. This essay turns its attention to the astronomical contexts for Rossetti's works, arguing that references to the heavens are not incidental but part of the painter-poet's participation in a demonstrably Victorian form of imaginative science that was preoccupied with how knowing and looking were changing considerably in the "radically ungrounded world"[1] brought about by the new visual cultures of nineteenth-century astronomy.

As John Holmes has noted, Rossetti did not—in spite of contemporary claims to the contrary—disavow "the possibilities of science for the arts." "In his poems," writes Holmes, "Rossetti weaves together scientific and esoteric concepts and knowledge in ways which acknowledge the imaginative potential of science while refusing to be bound by its limitations." In what follows I show how Rossetti's "quasi-scientific cosmology" not only finds a synthesis with the idiosyncrasies of his artistic endeavors, as Holmes proposes, but at once resonates more with the sciences and science fictions of his day than scholars have yet noticed and harbors some intriguing foreshadowings of scientific theories that would not emerge until the early decades of the twentieth century.[2] By attending to this deep-field view of the Damozel in relation to nineteenth-century and more recent astronomical thinking, we can glimpse these works' preoccupations with viewing and temporality. Rossetti can be seen to participate imaginatively in the wider Victorian project of wrestling with the "problems of where we see things *from*."[3] The restlessness of the Damozel—her refusal to go quietly into the good night sky of Heaven—is very much in keeping with what Anna Henchman has read as the Victorians' need to find "a vantage point from which to see and know the world" (p. 4). Though undiscussed by Henchman in her illuminating recent book *The Starry Sky Within: Astronomy and the Reach of the Mind in Victorian Literature* (2014), Rossetti, through his Damozel, also "displays a recurrent longing to get outside the limits of individual perception" (Henchman, p. 4). Why Rossetti fails to figure in her account and why discussion of his works' participation in astronomical discourse remains so scant has to do, I think, with a reluctance to look beyond the allegory of fleshly vs. spiritual love. The works' astronomical details appear incidental to most scholarly readings: merely adorning a plaintive retelling of the story of Dante and Beatrice. But as Kristin Mahoney has noted, Rossetti's painted Damozel "foregrounds the physicality of [the lovers'] division, . . . but the poem also dwells on the strange way in which time separates the two."[4] Attending directly to this "physicality"—not only of their desire to embrace but also of the features of the physical universe against which their longing is set—at once brings into focus the extent of Rossetti's interest in creating a scientific thought experiment and adds complexity to the tale of unrealizable desire. By looking *thence* at the Damozel's story, we can better get at some of its pain and suffering, some of its dilemmas of separation, distance, time, and eternity. To do this we need to telescope in on parts of the poem that are less often the objects of sustained viewing.

Seven Stars

Both Rossetti's poem and his painting encourage astronomical speculation. While it would be easy to dismiss the poem's references to space (e.g., the "fixed place of Heaven" and the "stars [singing] in their spheres" [ll. 49, 54]) as stylized throwbacks to an outmoded Ptolemaic cosmology,[5] a more modern picture is plainly visible in both his written and painted works. Let's begin by focusing on the most obvious celestial objects Rossetti depicts. The poem opens with the Damozel newly arrived in Heaven:

> The blessed damozel leaned out
>   From the gold bar of Heaven;
> Her eyes were deeper than the depth
>   Of waters stilled at even;
> She had three lilies in her hand,
>   And the stars in her hair were seven. (ll. 1-6)

It is significant that her luxuriant hair, described in the next stanza as "yellow like ripe corn" (l. 12), is embroidered with precisely seven cosmic jewels. In the painting only six stars are visible, and they are not dotted in her hair but suspended around her head like a diadem (fig. 1). Here the painted Damozel appears more akin to the "garlanded" handmaidens of Mary and the "unnumbered heads / Bowed with their aureoles" as described in the poem (ll. 110, 123-124). Granted, a viewer of the painting might imagine a seventh star, which, by following the halo's implied orbit, would be positioned behind the Damozel's head and so just out of view. For Jerome McGann this difference has more to do with myth than with space:

> The discrepancy defines the crown as the Pleiades, which traditional astrology saw as being composed of seven stars, though one—the "lost Pleiad"—was

> invisible. This lost Pleiad, a favorite subject in the romantic tradition since Byron, is Merope, who was cast from her starry place because she fell in love with a mortal man. In this context the Damozel is the lost Pleiad. Symbolically the Pleiades are a favorable sign, a forecast of good weather for navigation and agriculture. The number seven in this context also suggests the seven joys and seven sorrows of the Madonna.[6]

So far so good, and very much in keeping with the allusiveness and symbolic potential so frequently associated with Rossetti's work and with Pre-Raphaelite painting and poetry more generally. Like many other readers/viewers, McGann zooms in on the "astrological" and "favourable sign[s]." But what about the *astronomical*: the Pleiades as a cluster of real stars in the night sky?

To appreciate how we arrive at the myth of the lost Pleiad, we first need to perform the task of *resolving* the stars that form the Pleiades--that is, in the vocabulary of astronomy and its optical instruments, "reveal[ing] or perceive[ing] (a nebula) as a cluster of distinct stars."[7] In the nineteenth century, the Pleiades cluster was notoriously difficult to separate into discrete stellar entities. Noting that the Pleiades cluster belongs to the zodiacal constellation of Taurus, Jacob Green, writing in his 1824 book *Astronomical Recreations*, reminds us that Merope was "lost" because "she was the only sister" of the seven "who married a mortal." Very much in line with McGann's reading of Rossetti's story as one that echoes its classical antecedent by depicting a celestial woman whose mortal love remains on Earth, Green's account first turns to the myth as an explanation of why "her star is fainter than the rest."[8] If the Damozel in Rossetti's texts is a surrogate for Merope, as McGann suggests, then her star is correspondingly obscured in the painting, if not in the poem. What is more, in the painting Merope's star is not just hidden, though implied as an extension of the constellation of six stars we can see, but effectively *resolved* into the figure of the Damozel herself. But it was not just the power of myth that provided a way of describing why the seventh star might be fainter. In Rossetti's lifetime, the lost seventh Pleiad came and went, and not only in poems and paintings. The matter of resolving the individual stars in the Pleiades cluster (fig. 2) was also much discussed, and the myth's emphasis on *seven* sisters often confused observers, who could not always see what they thought they were supposed to see. Denison Olmsted's *An Introduction to Astronomy* (1841), for example, describes the Pleiades as "the most conspicuous cluster" in the constellation of Taurus, but he admits that "[w]hen we look *directly* at this group, we cannot distinguish more than six stars." For stargazers who would like to see more stars, he recommends J. F. W. Herschel's technique of oblique viewing: "by turning the eye *sideways* upon it, we discover that there are many more."[9] So the question of whether there are six or seven stars was, for Rossetti and his contemporaries (as quite possibly for us), a matter not just of legend or artistic representation but of how one looked *thence*—in this case not downward, as the Damozel does, but upward at the night sky as from the perspective of her Earth-bound lover.

For Rossetti's imagined terrestrial mourner, who hopes to get a clear view across the "gulf" of space, the most effective means of resolving his lost Pleiad would be not sideways but instrumental viewing, with a telescope. Even "the smallest telescope," notes Olmsted, will help bring the Pleiades into focus: "Telescopes show 50 or 60 stars crowded together and apparently insulated from the other parts of the heavens" (Olmstead, p. 257). In volume eight of his book *The Sidereal Heavens* (1847), Thomas Dick goes into greater depth about the number of stars in the cluster and explains how telescopes can help resolve more of them. Dick admits that there remains puzzlement among casual stargazers about the discrepancy between the seven stars of myth and the six typically visible to the naked eye: "It is generally reckoned that only *six* stars can be distinctly counted in this group by common eyes, but that originally they consisted of *seven*, which everyone could easily perceive, and it has therefore been conjectured that one of them has long since disappeared."[10] The myth of Merope, a Pleiad lost to our view, thus supplies a convenient backstory for commonplace optical shortcomings or the possibility that one of the stars at some point in human history in fact ceased to be.[11] While some viewers he mentions claimed to have seen more—seven or eight or even fourteen—when looking unaided at the cluster, their powers of vision are no match for the "numerous assemblage" of stars that a telescope can reveal:

> Dr. Hook, formerly professor of geometry in Gresham College, informs us that, directing his twelve-feet telescope (which could magnify only about seventy times) to the Pleiades, he did in that small compass count seventy-eight stars; and making use of longer and more perfect telescopes, he discovered a great many more of different magnitudes. (Dick, p. 147)

Using a telescope, then, becomes useful not only in a search for the lost seventh Pleiad but for her multitude of unsung sisters—the "endless unity" (l. 100) of angels, choirs, and heavenward winging souls comprising the heavenly host that Rossetti's poem mentions and that the painting suggests by the placement of smaller figures behind the foregrounded Damozel. Over a century on from Rossetti, our powerful telescopes reveal hundreds of stars in the cluster.

Like a Fretful Midge

Looking at and counting the Pleiades in Rossetti's works would likely have had, in addition to mythical import, topical astronomical resonance for Victorians. His poem and painting seem to focus attention on an indeterminacy of viewing that the telescope highlighted for nineteenth-century astronomers. Much there was to see. But just how much of it were viewers missing by looking with the naked eye? On the one hand, as the English astronomer Richard Anthony Proctor would note in his essay "The Photographic Eyes of

Science" (1883), the telescope is but an extension of the eye: "What the telescope has taught men has been really taught through the eye." On the other hand, Proctor would remind his contemporaries (Rossetti had died the previous year) that, compared with what and how the great telescopes are increasingly allowing observers to see the heavens, the power of the eye is "utterly insignificant."[12] By the end of Rossetti's life, the telescopic eye had become one of the nineteenth century's ultimate viewfinders (its counterpart was the microscope). It is not so surprising, then, that we should see the Damozel in the poem herself come into focus through language that brings to mind the period's burgeoning telescope technology. The first thing we learn about her in the 1850 version from *The Germ*, after we hear that she is "lean[ing] out / From the gold bar of Heaven," is that "Her blue grave eyes were deeper much / Than a deep water, even" (ll. 1-4).[13] Here the description is, more or less, one of conventional terrestrial beauty: her deep, liquid-blue eyes are at once alluring and deathly ("grave"). But when Rossetti revised the poem for inclusion in his *Poems* (1870), he removed the funereal blueness and instead emphasized a pellucid stillness: "Her eyes were deeper than the depth / Of waters stilled at even" (ll. 3-4). Propped on the periphery of Paradise, this redacted Damozel looks back toward Earth with eyes both deep, as in the original, and *reflective*. As a contributor to *Appleton's Journal of Literature, Science, and Art* would describe in 1872, "the dark, still water" that he viewed from the rail of a ship "reflected silently myriads of twinkling stars."[14] Eight years later, in 1880, Rossetti himself would use the image of reflective water in his sonnet on Coleridge, which he transcribed in a letter to Hall Caine: "Yet ah! Like desert pools that shew the stars . . . ."[15] The Damozel's eyes, as reimagined by Rossetti in 1870, seem similarly conceived to provide a "mirrored reflection of the midnight sky" (Kennan, p. 433). What is more, the revision renders her eyes not only more like her state of mind (inwardly reflective) but also more akin to the large reflecting telescopes that had been gaining in sophistication during the twenty-year period between Rossetti's two texts.

As Robert W. Smith notes, "The development of cosmology during much of the nineteenth century is largely a story not of conceptual breakthroughs but of big reflecting telescopes with speculum metal mirrors."[16] Using their increasingly large curved mirrors—some as big as 72 inches—to gather and focus light, nineteenth-century reflecting telescopes were an instrumental optimization not only of the eye but of a perfectly calm pool of water, which will, "at even," collect and reflect light from objects in the dark sky. But a telescope, as Proctor noted, has the ability to show the viewer light she cannot readily see with her naked eye, whether looking up at the sky directly or down at reflections on water. It does this because it can collect more light. The Damozel's bigger, deeper eyes—like large, polished reflecting pools—are perfectly equipped to collect otherwise dim starlight from very far away. Indeed, in 1856, just six years after Rossetti's poem appeared in *The Germ*, a "technique of silvering glass substrates was developed" that enabled lighter, and so larger, mirrors than could be manufactured using polished metal.[17] Around the time of Rossetti's later 1870 version, large reflecting telescopes had reached a turning point in design and technology (Smith, pp. 289, 298).[18] At the end of Rossetti's life, they were capable of offering "excellent photographs of planets and nebulae" (Hardy, p. 10), the latter a loose term that at the time might denote a nearby galaxy[19] or a star cluster, such as the Pleiades. With her eyes as smooth as silvery still water, Rossetti's optically enhanced Damozel of 1870 appears to us well designed to cast a powerful gaze—a gaze that Victorian technology was also racing to perfect.

But just how powerful? From her vantage point in "God's house," the Damozel has difficulty making out both our star, the sun, and the Earth:

It was the rampart of God's house

That she was standing on;
By God built over the sheer depth
The which is Space begun;
So high, that looking downward thence
She scarce could see the sun.

It lies in Heaven, across the flood
Of ether, as a bridge.
Beneath, the tides of day and night
With flame and darkness ridge
The void, as low as where this earth
Spins like a fretful midge. (ll. 25-36)[20]

While both are sufficiently far as to be almost imperceptible, they nonetheless appear to be visible to her across the "void" of space. But where, exactly, *is* the heaven she inhabits? And how much "void" is there between it and Earth? Objecting to what he considered the "illogical" astronomy of "The Blessed Damozel," Rossetti's contemporary, the physician-poet Thomas Gordon Hake, suggested a region "say two billion miles or so" distant from the Earth, "like Uranus or Neptune."[21] Would it not be impossible that "a world as remote from the damozel as Uranus is from us be seen in motion?" It is a question worth asking. But, then, the poem offers little evidence for Hake's supposition about her position at Uranus or Neptune. It may be that he considered these two most distant planets in the solar system to be a kind of boundary: after all, it was only in the 1846 that Neptune was first observed by telescope, confirming its status as a legitimate planet, thus extending the solar system beyond the orbit of Uranus. In any case, Neptune's closest position to the Earth is 2.7 billion miles, making Uranus (at 1.6 to 1.9 billion miles from Earth) more in keeping with Hake's designation of "two billion miles or so." It makes more sense, I think, to imagine the Damozel's heavenly abode being situated within the Pleiades cluster, which both Rossetti's poems (1850 and 1870), as well as his later painting, explicitly invite us to do. That, of course, involves an altogether larger cosmological ballpark. The Damozel would certainly need her powerful telescopic eyes in good working order to catch a glimpse of a spinning Earth at such a distance. Current calculations place the Pleiades between 118 and 140 parsecs (or roughly 423 light years) away from our planet.[22] That is the equivalent of roughly 2 quadrillion (2,486,658,532,856,666) miles, or about 10 billion (10,410,745,150) times further away from us than the moon (which is, on average, 238,855 miles away from Earth). From the moon, as we have seen in various images—most famously the *Earthrise* photograph from the Apollo 8 mission in 1968 (fig. 3)—Earth looks about the same size as the moon looks to us from Earth; its blue oceans and white clouds are clearly visible. Yet from Mars (a mere 33.9 million miles away at its closest approach), the Earth reduces to a bright spot, as seen by a NASA rover in 2014, with our moon just visible a short distance from it. Going farther out into the solar system, Earth diminishes considerably. At 3.7 billion miles away, it is only a "pale blue dot," as captured memorably by the Voyager 1 space probe in 1990 (fig. 4). No world teeming with life would be visible at that distance, much less a pining lover, and no axial rotation would be apparent. Near the edges of our solar system, about 9 billion miles away, we would lose sight of it altogether. So without the aid of her improbably powerful telescope eyes, the Damozel would never be able to look back at Earth and see it spinning "like a fretful midge." Thus, Hake was generally correct in questioning the Damozel's vision.

But suppose for a moment that she could see a spinning Earth, as the poem seems to suggest. How would it work? What would she see? We get a pretty good idea from a text written just four years before the appearance of Rossetti's poem in *The Germ*. In 1846 the German amateur astronomer Felix Eberty published *The Stars and the Earth; Or, Thoughts* *upon Space, Time, and Eternity*. This popular work, which ran to several editions in English alone, provides an extended thought experiment, uniting contemporary science with Christian theology. Eberty imagines an "observer" at various points in space, from within our own solar system and from various points farther away, "who was provided either with the requisite power of vision, or a sufficiently good telescope" to look back and "distinguish all particulars upon our little earth shining, but feebly luminous in its borrowed light."[23] Upon a scaffolding of nineteenth-century astronomical science—details of stellar magnitudes and distances, as well as calculations relating to the speed of light—Eberty takes readers on a flight of fancy through space, viewing Earth from a number or more or less distant vantage points, including the planet Uranus, the constellation Centaur, and the star Vega. But rather than just asking readers to suspend their disbelief and suppose a human were able to travel far and wide through great expanses of hostile space, Eberty grants that, while "the laws of thought" may permit "a man [to] travel to a star in a given time" and view Earth using "so powerful a telescope as to be able to overcome every given distance," it is really only God whose omnipresence and superior vision make such viewing possible: his "eye," unlike those of mortals, can be "present at every point of space." Eberty does not say whether or not the angels or those, like the Damozel, only just about to join the heavenly community would be able to share the powers of the Eye of Providence. But it does seem to be along the lines of the fantasy Rossetti proffers in "The Blessed Damozel." On "the rampart of God's house" (l. 25), she looks back with a telescopic gaze that brings distant scenes nearer than they could possibly be. Though eternity beckons, the Damozel strains to focus her attention on that which she has left behind on the small, dimly visible Earth: life among mortals and, above all else, the still living lover whose embrace she so desperately desires. That Rossetti does not withhold from her the tantalizing possibility of seeing these things even at such an impossible distance compounds the enduring longing and immortal sorrow that the poem attempts to dramatize. If the Damozel were none the wiser about what she is missing on Earth, would it not making crossing the threshold of heaven easier? It is precisely her awareness that she might look back to Earth and see the lover who is utterly out of reach (to her touch if not her gaze) that provides an occasion for her reverie and her weeping, as well as a dramatic situation for the poem.

But in the logic of Eberty, there is a further sorrow in store for the Damozel, whose leaning and looking signify a despairing attempt to reconnect with her mortal lover. For while there may be *looking* there is decidedly no *going* back. Even in looking back there is no guarantee that she will see what she wishes. The gift of powerful viewing, in fact, would become a further ordeal of tantalizing and torturous disconnection for the soul that would attempt to exploit a divine infinity of vision to see what remains on Earth. If the Damozel were to bring a tiny spinning Earth into focus, what she would see would be not her lover but a world into which he was yet to be born. For the Earth she sees would be an earlier Earth, not the Earth of 1850 or 1870, depending on which version we choose to synchronize with the events the poems depicts. Why? Because of what is called "lookback time." "The lookback time of an object," writes the Norwegian physicist Øyvind Grøn, "is the time required for light to travel from an emitting object to the receiver."[24] In this case, the emitting object is Earth and the receiver is the Damozel. Though light travels fast—299,792,458 meters per second in a vacuum—and though it appears, where emitting object and receiver are relatively close together, to take no time at all—over the great distances of space the lag between emitting and receiving can be considerable. As Eberty writes regarding the lookback time for people observing the moon from Earth:

> Thus light travels two hundred and thirteen thousand miles in a second; and, as the moon is two hundred and forty thousand miles distant, it follows that, when the first narrow streak of the crescent moon rises above the dark horizon, nearly a

> second and a quarter elapses before we see it. . . . The moon, therefore, rises above the horizon a second and a quarter before it becomes visible to us. (pp. 10-11)

In short, we see the moon not as it is but as it was just over a second before. We see the moon's *past*, albeit the recent past. The more distance light has to travel, of course, the more this phenomenon is pronounced. The sun's light reaches us eight minutes after leaving that star, meaning that, by the time its light arrives on Earth, we see it eight minutes in the past. And so on. If the Damozel's heaven were located near Uranus, as Hake postulated, then she would see Earth some two hours in the past by Eberty's calculations. In this scenario, she would not only see her lover but quite possibly herself with him—before death took her from his arms. That would be a sight to induce anguish, certainly. But if her heavenly abode is the Pleiades cluster, then she sees something altogether more sorrowful. If she could see Earth from there, she would see it as it was 423 years in the past: the year 1427 (for the 1850 version of the poem) or 1447 (for 1870). The sadness here comes not only from not seeing her lover but also from the prospect of having to wait so long to glimpse him again, and even longer for any reunion among the angels with their "citherns and citoles" (l. 186). Thus, by placing the poem in astronomical focus, we might well hear a greater sadness in her parting words than perhaps Rossetti could appreciate: "All this is when he comes" (l. 195). *When* indeed.

As Ten Years

The temporalities involved in the Damozel's looking back are more complicated than Eberty's science fiction suggests, especially when we pause to unpick the implications of light speed on her looking. By the late seventeenth century, evidence was accumulating to verify growing speculation that light was not instantaneous but that it had a definite speed of travel. During Rossetti's own lifetime, work by James Clerk Maxwell, Gustav Kirchhoff, and others was underway to resolve the speed of light and other aspects of the electromagnetic spectrum. Not until the twentieth century, however, was this finite speed fixed as a constant (by Albert Einstein's theory of special relativity) and measured with extreme precision. While Maxwell would reveal light's wave character, light was frequently described in both popular and professional writing as a "beam," "ray," or "flash"—terms that attempt to capture both its great velocity and its "undulating," flame-like character as it moves through the "hypothetical medium . . . called æther" (this latter substance is discussed in more depth below). Popular optical experiments often involved the glowing light of candle flames as observed passing through small holes or thin slits in screens to demonstrate how light (though it may be wavelike in character) travels in straight lines or beams.[25]

Such experiments not only underpinned nineteenth-century understandings of how light moved but also inspired imaginative thinking about the possibility of accelerated motion—for the human soul, if not the body. Because the soul had often been figured in terms of a flame (nineteenth-century texts abound with references to a "soul-flame," a "soul flame-winged," and a "soul's flame mount[ing] heavenward"[26]), might not it too travel like other luminous phenomena? In his 1867 book *The Immortality of the Soul*, the American minister Hiram Mattison considered the soul to "act with the speed of lightning." Quoting from Charles Giles's 1843 poem *Triumph of Truth*—which follows the soul on her "travel round the globe," "visit to the Moon, the portals of the Sun," and journey "To Heaven's metropolis were seraphs burn"—Mattison imagines "the celerity with which the soul is capable of carrying on her various processes": "All this she can do because she is *a spirit*. Were she of the earth, she must needs move like earthly things . . . ; but spurning the dull tediousness of inert matter, she acts like a celestial being . . . ."[27] Thus, when Rossetti imagines how "the souls mounting up to God / Went by [the Damozel] like thin flames" there is at once a visual echo of the “cone of rays” (Deschanel, p. 869) that candlelight passing through a small aperture would produce (bringing to mind the optical terminology and the means by which it was frequently exhibited, in widely circulating periodicals, treatises on optics, and popular scientific exhibitions) and a hint of the swiftness of the immortal soul, as depicted in works by contemporary clergymen, such as Giles and Mattison.

But what do such associations really matter? The speed of light and its relation to the speed of the soul, it turns out, has a great deal to do with how we might gauge Rossetti’s fantasy of looking back thence, from the bar of an extremely distant Heaven. In the end, Mattison grants that the soul may in fact be capable of instantaneous movement, “outstrip[ping]” even “sunbeams.” What if the same were true of the Damozel’s soul? If the Damozel were to look back from Heaven to Earth in 1850 or 1870, then she would see 423 years into our planet’s past because the light she would see from the Pleiades would have left Earth in 1427 or 1447, as described above. This calculation assumes that she is, in fact, looking back from heaven *in 1850/70*, which would be possible only if her own spiritual transit from Earth to the Pleiades were *instantaneous*. One moment she is alive on Earth, held tight by her lover, and the next she is knocking on heaven’s door. That may well be the case—though I am not in a position to verify such a hypothesis. Indeed, we are given to understand from stanza 3 of Rossetti’s poem (both the 1850 and 1870 versions), that to her there “scarce had been a day” since she became “One of God’s choristers” (ll. 13-14). Whether her journey to heaven were more or less instantaneous, taking a second or a day, would make but little impact upon the basic outlines of the lookback scenario already outlined. But what if even souls of the departed are held to the universal speed limit? What if “soul light,” often contrasted with the dark and base matter of the body, behaved like any other light, travelling at a constant rate of 671 million miles per hour? That would make her looking very different indeed, for moving at light speed the Damozel’s spirit would not arrive in heaven in 1850/70, but only after a period of 423 years (the time it would take her, travelling at the speed of light, to reach the Pleiades). She would arrive there in what would be the year 2273/93. In this scenario, of course, she is still travelling now. But when she finally does arrive, Oh happy Damozel! Her telescopic view of Earth will reveal to her life in the year 1850/70, because she would see light that left the planet around the same time she did. Effectively, then, she will be able to pick up viewing terrestrial existence at the point she left off when she died.

Were it that simple. Travel at or near the speed of light involves a reality whose laws seem almost as far-fetched as (if not more so than) Eberty's star-hopping time-travel. What might happen if the Damozel's disembodied spirit set off from Earth at the speed of light, or at least at some fraction of it? Rossetti's description of the Damozel's perspective on temporal phenomena holds a clue:

> From the fixed place of Heaven she saw
> 	Time like a pulse shake fierce
> Through all the worlds. . . . (ll. 49-50)

The emphasis here is not only on the quick, pulsating, and ubiquitous presence of time in the universe but on her *seeing time*. Coupled with the poem's acknowledgement of a discrepancy between the temporal experiences of her and her Earthbound lover, these lines resonate with a context of emerging relativistic theories of spacetime—theories that were beginning to percolate as Rossetti's own time on Earth was drawing to a close. In the 1860s, between the publication dates of the two "Damozel" poems discussed here, James Clerk Maxwell was working on his wave theories of electromagnetism. He began from the assumption, shared with many of his contemporaries, that space was composed of a substance called ether (mentioned above), through which light propagated. Indeed, this is how Rossetti's poem imagines the space between Earth and Heaven: they are separated by "the flood / Of ether" (ll. 31-32). If this ether were both universal and unmoving, as Maxwell postulated, then it provided a constant or absolute frame of reference. Under these conditions, all observers should perceive the velocity of light in the same way, against the stationary ether backdrop. However, problems began to arise when, between 1881 and 1887, the American scientists Albert A. Michelson and Edward W. Morley presented work that called into question not only the function but the very existence of ether. Hoping to verify the presence of a so-called ether wind, a kind of current that should be perceivable when the Earth moves through the static ether environment of space, Michelson and Morley conducted an experiment that involved reflected light using an interferometer, a device that produces interference patterns in multiple light sources. They had anticipated

> observ[ing] a shift in the interference fringes formed when the interferometer was rotated at 90 degrees, which would show that the speed of light measured in the direction of Earth's motion through space was different from the speed of light at right angles to Earth's motion. They did not see such a difference . . . . They interpreted the results as disproving the existence of the ether.[28]

This unexpected conclusion would have profound consequences. If there were no ether wind and, correspondingly, no ether, then there might be no "absolute space against which the rest of an inertial system could be defined."[29] "By the early 1900s," writes John Gribbin, "experiments" of this kind "had shown that every measurement of the speed of light always gave the same answer, *c*." As he continues,

> The Earth moves through space at some velocity, which we might call *v*. A light beam overtaking us at velocity *c* does *not* have a speed *c* - *v*, and nor does a beam of light approaching us from the opposite direction have a speed of *c* + *v*. Whatever our velocity, and whichever direction the beam of light is coming from, when we measure its speed we always get the answer *c*.[30]

That light travels at a constant speed, whether moving with or against the direction of another moving body (e.g., the Earth), would allow later theorists to unpick another ostensibly absolute frame of reference: time. Only a decade after Rossetti completed his painted Damozel, the door was beginning to open to theories that would thoroughly relativize the whole of spacetime, in the process casting doubt on "an absolute time [that is] the same for all coordinate systems" (Bynum, et al., p. 371).

"[T]he velocity of light," as Bertrand Russell would remind us in *The ABC of Relativity* (1925), "is the same in all directions."[31] Light does not slow down or speed up. But accepting this principle demands that we rethink our notions of what space and time fundamentally are. Indeed, theories of relativity have implications not only for how we understand light to travel but, more importantly for the Damozel, for how observers perceive light and, crucially, *time*, depending on their relative perspectives. As we will see, it is hardly surprising that there exists a discrepancy between time as experienced by the lover on Earth and the Damozel, having just travelled to the Pleiades at or near the speed of light. While several scientists proposed errors in the Michelson-Morley experiment, the implications of its "null result" could not be ignored. But it was not until the early decades of the twentieth century, with Albert Einstein's theories of relativity, that a satisfying theoretical explanation was offered. In his groudbreaking 1905 paper "On the Electrodynamics of Moving Bodies," Einstein developed his "Principle of Relativity" (typically called his theory of *special relativity* to distinguish it from his later theory of *general relativity*). Here Einstein "abolished the idea that space, time and mass are absolute quantities." Among other things, his theory establishes light as the universal speed limit, entangles space and time, and relativizes the observer's frame of reference—in short, how one *sees* or *experiences* time is a direct consequence of how one is observing it, whether the observer is at rest or in motion relative to another observer (Bynum, et al., p. 371). Crucially, a moving observer would not perceive time in the same was a stationary one. As Einstein himself claims,

> we cannot attach any *absolute* signification to the concept of simultaneity, but that two events which, viewed from a system of co-ordinates, are simultaneous, can no longer be looked upon as simultaneous events when envisaged from a system which is in motion relatively to that system.[32]

Where frames of reference differ (at rest vs. in motion), there can be no simultaneity of events. Viewers will not agree about what they see or how much time it takes. Thus, according to Einstein's theory, it would be impossible to establish an absolute simultaneity for the two observers in Rossetti's poem, the Damozel and her lover, because he is, for all intents and purposes, stationary on Earth, while she has moved very quickly to a distant star cluster. For this reason they will not have the same perception of time elapsing during the course of her spiritual journey.

Though I am not suggesting that Rossetti could have foreseen Einstein's relativity model, it remains interesting to note his prescience in imagining a time lag between the two characters in his poems. What is more, he got it the right way around. The Earthbound lover, at least from the Damozel's point of view, would appear to be moving more *quickly* through time and, thus, *ageing more* than the Damozel. What Rossetti seems to anticipate here (almost certainly without knowing it) is a phenomenon known as time dilation, a stretching or slowing of time, which is a key component of Einstein's theory of special relativity. As I mentioned above, one consequence of light speed being a constant is that time changes relative to it. There is no $c + v$ or $c - v$, for light always travels at c. Time, by contrast, is not considered to be a constant; rather, it is *relative*. So if the speed of light does not change, then the elapsed time, as perceived by the different observers of that light relative to one another, will. In basic outline, time dilation explains how time *slows down* for someone or something *in motion*. For the Damozel's spirit, travelling through space at a fraction of the speed of light, time would appear to move slower relative to her lover at rest on Earth. Indeed, interstellar travel at high speeds would involve, theoretically at least, a marked time dilation effect. Consider the following example, drawn from a recent Physics textbook:

> Alpha Centauri, a nearby star in our galaxy, is 4.3 light years away. This means that, as measured by a person on earth, it would take 4.3 years to reach this star. If a rocket leaves for Alpha Centauri and travels at a speed of $v = 0.95c$ [95% of the speed of light] relative to the earth, by how much will the passengers have aged?

The solution to this problem is presented by the authors as follows: "The people aboard the rocket will have aged by only 1.4 years when they reach Alpha Centauri, and not the 4.5 years an earthbound observer has calculated."[33]

Alpha Centauri—a system of three stars, the binary star Rigil Kentaurus (comprising Centauri A and B) and the smaller star Proxima Centauri—is the nearest "star" to our sun. The stars of the Pleiades cluster are in fact comparatively nearby as well. Like many of the ones we see in the night sky, these stars, along with our own sun, are located in the Orion Arm of the Milky Way. Nevertheless, there is a considerable time dilation involved in the journey to the Pleiades—much more than for a journey to Alpha Centauri. If interstellar travel to a region of our galaxy only 4.3 light years away ages the traveller only about 1/3 of the person on Earth, what would the age gap be between the Damozel and her lover after her much longer trip to a start cluster 423 light years away? Using the same equation but with the new distance, we can work out the time dilation. To find Δt_0 (elapsed time for the Damozel), we begin with Δt (elapsed time for the lover on Earth), which we know to be the distance of the Pleiades divided by $0.95c$ (because, for the purposes of this thought experiment, we are imagining the Damozel's spirit to travel at 95% the speed of light). That gives us a figure of

445 years. Now we have enough information to run the formula, which can be expressed as follows:

$$\Delta t_0 = \Delta t \sqrt{1 - \left(\frac{v^2}{c^2}\right)} = (445 years)\sqrt{1 - \left(\frac{0.95c}{c}\right)^2} = 138 years$$

One hundred thirty-eight years is the time the journey to the Pleiades takes *from the Damozel's perspective* (also a roughly 1:3 ratio, as in the Alpha Centauri example). Thus, she arrives in the Pleiades in the year 1988/2008 (again, where 1850/1870 are her assumed years of departure). Looking back from the star cluster, the Damozel would see light that left Earth 423 years ago—not 423 in the past from her own perceived arrival time, but 423 years behind the Earthbound lover's estimation of her arrival: in other words (1850/1870+445)-423 = 2295/2315-423. Thus, she sees Earth in 1872/1892. If both lovers were young at the time of the Damozel's death, as Rossetti's texts suggest, then there is a good chance that the she would, in fact, be able to employ her heavenly telescopy to see him, though he will have aged considerably. Though from her theoretical perspective 138 years would have passed, her newly immortal status presumably means, as the texts imply, that she has aged not at all (there is no post-mortem ageing, after all). If we imagine her to be twenty-eight years old in 1850/1870 (synchronizing the Damozel's age with the age of Alexa Wilding (1847-1884), Rossetti's model, at the time he began painting her in 1875), then her lover, whom we will postulate to be roughly the same age, would be fifty years old in 1872/1892. While Rossetti's numbers may not have been correct, the general drift of his scenario was. According to the mathematics of Einsteinian special relativity, for the day that seems to have elapsed for the Damozel, her lover has experienced just over three Earth days.

Sensibly Present?

The same year Rossetti brought out his *Poems*, featuring the slightly revised and more telescopic "Damozel," Richard Proctor, whose own work on vision and magnification I discussed above, published a popular book on astronomy, *Other Worlds than Ours* (1870). Describing in detail features and processes of the Earth, planets in our solar system, and the sun, as well as other stars and nebulae, Proctor offers speculation on some of the big questions exercising late-Victorian astronomers: whether planets might orbit other stars, whether other stars are like our own, whether some of the unresolved nebulae we see like smudges on the night sky might be separate galaxies like our Milky Way. But even this man of science appreciates that the human senses and their prosthetic extensions—telescopes and spectroscopes, for example—allow us to peer only so far into the vast blackness of space. To go further, he suggests, one needs to rely on "the mental powers which [God] has given to His creature Man."[34] Proctor's emphasis on using our imaginations to see beyond what is readily apparent, to our eyes or our instruments, resonates with John Tyndall's remark, in a lecture delivered the same year: "imagination becomes the mightiest instrument of the physical discoverer."[35] As if to exemplify the extent to which the imagination aids astronomical inquiry, Proctor bookends his study with two arguably more fanciful approaches to time, eternity, and the heavens: lines from Alfred Tennyson's *In Memoriam* (1850) conclude his introduction, while an extended unpicking of Eberty's *The Stars and the Earth* forms the bulk of the book's conclusion. The lines he quotes (a little loosely) from Tennyson's elegy are from section 95:

  And came on that which is, and caught
The deep pulsations of the world,

Æonian music measuring out
  The steps of Time— . . . . (ll. 39-42)[36]

Fittingly, in what the poem describes as a night scene, Tennyson's speaker imagines being "touch'd . . . from the past" (l. 34) by his dead friend Hallam, who has reached from beyond the grave as through time and space. That Proctor, as his book draws to a close, should turn to Eberty's fantasy of replaying time by traversing the gulf of space with a God-like power of vision is in keeping with the longing of the bereaved speaker of Tennyson's poem, who wishes to compact time and space so that Hallam's "living soul" can "flash" upon him, like the "deep pulsations" (ll. 36, 40) of light racing through the Universe. Both texts share a yearning for a mechanism that will provide imaginative consolation: holding out the possibility that neither death nor the vastness of interstellar space can truly separate us from loved ones or the moments of human existence that, because of the relentless arrow of time, are forever out of our reach. Proctor's own consolation comes from the knowledge, very much akin to that expressed in Eberty's book, that even while humans cannot transcend space and time to reach back into the past or grope ahead into the future, for God all is seen and known:

> all the worlds existing throughout space are, in a very definite and special manner, watched over and controlled by an omnipresent, omnipotent, and omniscient Being; that before him the infinite past and the infinite future of the universe are at all times sensibly present . . . . (Proctor, *Other Worlds*, p. 342)

If what is past is not "sensibly present" to us, though we might long for its touch or pulsation greatly, at least we might take comfort in knowing it is to God.[37]

The Damozel, as I have suggested in this essay, is dwelling on similar matters. In his painting and poems, Rossetti is participating in a form of what Tyndall termed "the scientific use of the imagination" (the title of his 1870 lecture)—his works, like Tennyson's elegy, are straining to conceive of a knowledge that is not readily available via the senses. In reading Rossetti's Damozels works as examples of this kind of imaginative science—rather than as works in which some quasi-scientific fantasies merely provide a dramatic occasion—we give the poet-painter credit for going beyond that which our senses can confirm: the spatial dimensions of the heavens and the relativities of time. That Rossetti makes a version of lookback time a feature of his poem is an indication that he is attempting to get his mind around complexities that Eberty, Proctor, and later Einstein (who himself acknowledged Eberty's heralding of theories of relativity[38]) would also struggle to imagine. Where Rossetti, like Tennyson, uses poetry as a means of going beyond what his senses can validate, Eberty turns to theologically inspired science fiction, Einstein to mathematical equations—each relying on his own particular "mental powers" to deliver what empirical evidence does not. In the temporal, telescopic fantasies of Proctor and Eberty, there is a "perfect history" (Proctor, *Other Worlds*, p. 342) to behold, where all humans, alive and dead, are where and when they should be. The unending travel of "light-messages," which radiate through spacetime "for millions on millions of ages,"[39] gives what Isobel Armstrong has termed an "uncanny" endurance to humans and their fleeting encounters. Though our moments with lovers on Earth may pass into history or oblivion, lights records and relays them infinitely: they are "guaranteed by the immortality of light" (Armstrong, p. 255). Yet the ocular solace that light allows is, as the pining Damozel doubtless intuits, merely an imperfect substitute for sensible presence—an eternity of carnal embrace—that she hopes to find in the afterlife. It is unlikely the Damozel will find either the consolation or the prospect of eventual consummation that has prompted her looking back.

(9,830 words, including abstract and notes)

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[1] Isobel Armstrong, *Victorian Glassworlds: Glass Culture and the Imagination 1830-1880* (Oxford: Oxford Univ. Press, 2008), p. 254.

[2] See John Holmes, "Dante Gabriel Rossetti and Science," *Review of the Pre-Raphaelite Society*, 21, no. 3 (2013): 54-64.

[3] Anna Henchman, *The Starry Sky Within: Astronomy and the Reach of the Mind in Victorian Literature* (Oxford: Oxford Univ. Press, 2014), p. 3.

[4] Kristin Mahoney, "Work, Lack, and Longing: Rossetti's 'The Blessed Damozel' and the Working Men's College," *Victorian Studies*, 52, no. 2 (2010): 236.

[5] Dante Gabriel Rossetti, "The Blessed Damozel," *Poems* (London: F. S. Ellis, 1870), p. 1. Unless otherwise indicated, all future quotation to Rossetti's poem are to this edition. Hugh Thurston quotes from Ptolemy's second-century A. D. *Almagest*: "the earth is essentially a point compared with its distance from the sphere of the so-called fixed stars." See Hugh Thurston, *Early Astronomy* (New York: Springer-Verlag, 1994), p. 1. The astronomer George Gamow explains this system in relation to what we now know about the structure of the heavens: "In ancient astronomy, the stars that composed the different constellations in the celestial sphere where called 'fixed stars,' in contrast to the 'wanderers,' or 'planets,' which move among the fixed stars with comparative rapidity. We know now that these . . . 'fixed stars' also move through space, and indeed with velocities even greater than those of the planets." See George Gamow, *The Birth and Death of the Sun: Stellar Evolution and Subatomic Energy* [1940] (Mineola, NY: Dover, 2005), p. 185.

[6] See McGann's note on the poem in Dante Gabriel Rossetti, *Collected Poetry and Prose*, ed. Jerome McGann (New Haven: Yale Univ. Press, 2003), p. 377n6.

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[7] Definition 13a of “resolve, v.” *OED Online*. December 2018. Oxford Univ. Press. http://www.oed.com/view/Entry/163733?rskey=HzuAxq&result=2&isAdvanced=false (accessed December 10, 2018).

[8] Jacob Green, *Astronomical Recreations; Or Sketches of the Relative Position and Mythological History of the Constellations* (Philadelphia: Anthony Finley, 1824), p. 67.

[9] Denison Olmsted, *An Introduction to Astronomy* (New York: Collins, Keese, and Co., 1841), p. 257.

[10] Thomas Dick, *The Sidereal Heavens, and Other Subjects Connected with Astronomy*, vol. 8 (Philadelphia: E. C. and J. Biddle, 1847), p. 147.

[11] Given the comparative youth of the Pleiades cluster (around 80 million years) and that fact that stars can take millions of years to die, this latter explanation seems unlikely. The “lost” Pleiad, Merope, is hardly dim and certainly not dead—it is actually one of the brighter stars in the cluster.

[12] Richard A. Proctor, “The Photographic Eyes of Science,” in *Literature and Science in the Nineteenth Century: An Anthology*, ed. Laura Otis (Oxford: Oxford Univ. Press, 2002), p. 85.

[13] Dante Gabriel Rossetti, “The Blessed Damozel,” *The Germ*, no. 2 (Feb. 1850): 80.

[14] George Kennan, “The Aurora of the Sea,” *Appleton’s Journal of Literature, Science, and Art*, 8 (Oct. 1872): 433.

[15] Dante Gabriel Rossetti, letter to Hall Caine, 27 July [1880], reprinted in *Dear Mr. Rossetti: The Letters of Dante Gabriel Rossetti and Hall Caine 1878-1881*, ed. Vivien Allen (Sheffield: Sheffield Academic Press, 2000), p. 137.

[16] Robert W. Smith, “Raw Power: Nineteenth-Century Speculum Metal Reflecting Telescopes,” *Cosmology: Historical, Literary, Philosophical, Religious, and Scientific Perspectives*, ed. Norriss S. Hetherington (New York and London: Garland, 1993), p. 289.

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[17] John W. Hardy, *Adaptive Optics for Astronomical Telescopes* (New York and Oxford: Oxford Univ. Press, 1998), p. 10.

[18] Smith traces "the age of large speculum metal reflectors" to the "late 1860s," when other technologies, including "the silvering of glass mirrors" ushered in a "coming age of the big reflecting telescope."

[19] Our nearest galactic neighbor, the Andromeda Galaxy or M31, was not established to be a separate galaxy beyond the Milky Way until the early twentieth century.

[20] The below arguments are not materially affected by changes Rossetti made to the poem between 1850 and 1870, so I have quoted from the later version of the text, unless otherwise indicated.

[21] [Thomas] Gordon Hake, *Memoirs of Eighty Years* (London: Richard Bentley and Son, 1892), p. 217.

[22] As Malcolm S. Longair explains, "The unit of distance used in astronomy is the *parallax-second*, or *parsec*. It is defined to be the distance at which the mean radius of Earth's orbit about the Sun subtends an angle of one second of arc. . . . Sometimes, it is convenient to measure distances in *light-years*, which is the distance light travels in one year: one light-year = 9.4605×10^{15} m. Thus, 1 pc = 3.26 light-years." See Longair, *High Energy Astrophysics*, vol. 2, 2nd edn (Cambridge: Cambridge Univ. Press, 1994), p. 365.

[23] [Felix Eberty], *The Stars and the Earth; Or, Thoughts upon Space, Time, and Eternity*, 3rd ed. (Boston: Wm. Crosby and H. P. Nichols, 1849), pp. 19, 20.

[24] Ø. Grøn, *Lecture Notes on the General Theory of Relativity: From Newton's Attractive Gravity to the Repulsive Gravity of Vacuum Energy* (New York: Springer Science, 2009), p. 239.

[25] A. Privat Deschanel, *Elementary Treatise on Natural Philosophy*, trans. J. D. Everett (New York: D. Appleton and Co., 1873), pp. 865, 867.

[26] See, for example, Clara Clayton's poem "Apple Blossoms," *The Galaxy*, 16 (1873): 173; Emma Tatham's poem "On the Death of Dr. Beaumont," in her *The Dream of Pythagoras, and Other Poems*, 5th edn (London: Wesleyan Conference Office, 1872), p. 189; and Hans Christian Andersen's story "A String of Pearls," in his *Stories and Tales* (Boston and New York: Houghton, Mifflin, and Co., 1870), p. 199.

[27] Hiram Mattison, *The Immortality of the Soul, Considered in Light of the Holy Scriptures, the Testimony of Reason and Nature, and the Various Phenomena of Life and Death* (Philadelphia: Perkinpine and Higgins, 1867), pp. 283-284. See also Charles Giles, *The Triumph of Truth; Or, the Vindication of Divine Providence. A Poem; in which Philosophy, Theology, and Description Are Combined* (New York: G. Lane and P. P. Sandford, 1843).

[28] See entry for "Michelson-Morley Experiment" in *Encyclopedia of Science and Technology*, ed. James Trefil (New York: Routledge, 2001), n. pag.

[29] See W. F. Bynum, et al., ed., *Dictionary of the History of Science*, (Princeton: Princeton Univ. Press, 1981), p. 371.

[30] John Gribbin, *In Search of the Big Bang: The Life and Death of the Universe*, rev. edn (London: Penguin, 1998), pp. 85-86. The generally accepted value for *c*. is now taken to be 299,792,458 meters per second. This value is used in my later calculation for time dilation.

[31] Bertrand Russell, *The ABC of Relativity*, rev. edn, ed. Felix Pirani (London: George Allen and Unwin, 1958), p. 27.

[32] Albert Einstein, "On the Electrodynamics of Moving Bodies," originally published in *Annalen der Physik*, 17 (1905): 891-921. The English version quoted here is available via the Freie Universität Berlin website, <http://users.physik.fu-berlin.de/~kleinert/files/eins_specrel.pdf>, p. 5.

[33] John D. Cutnell and Kenneth W. Johnson, *Physics: Volume 2*, 10th edn (Hoboken, John Wiley and Sons, 2015), pp. 803-804.

[34] Richard A. Proctor, *Other Worlds than Ours* (New York: P. F. Collier and Son, 1901), p. 21.

[35] John Tyndall, “On the Scientific Use of the Imagination (1870,” *Literature and Science in the Nineteenth Century*, ed. Laura Otis (Oxford: Oxford Univ. Press, 2002), p. 69.

[36] Alfred Tennyson, *In Memoriam*, *Tennyson’s Poetry*, 2nd edn, ed. Robert W. Hill (New York and London: Norton, 1999), p. 264. There are some small discrepancies between the version quoted here and the one reprinted (possibly from memory) in Proctor’s text.

[37] Everything is present at once to the poet’s eye, as well. As Tirthankar Bose has noted in relation to the poem’s curious narration, “The poet’s is the omniscient viewer’s eye that can freely swivel from heaven the earth, transcending all barriers of time and space . . . .” See Tirthankar Bose, “Rossetti’s ‘The Blessed Damozel,’” *The Explicator*, 53, no. 3 (1995): 151. Thus, outside the relativistic perspectives of the Damozel and her love—for whom no unified, constant, and simultaneous spacetime exists—there is Rossetti’s totalizing gaze, supplying the poem with spatiotemporal cohesion.

[38] See Karl Clausberg, “A Microscope for Time: What Benjamin and Klages, Einstein and the Movies Owe to Distant Stars,” *Given World and Time: Temporalities in Context*, ed. Tyrus Miller (Budapest: Central European Univ. Press, 2008), p. 298.

[39] R. A. Proctor, *The Expanse of Heaven: A Series of Essays on the Wonders of the Firmament* (London: Henry S. King and Co., 1873), p. 209.