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## Literature and Science in the Nineteenth Century: The Case of Tennyson's *The Princess*

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Magdalena Pypec

## Literature and Science in the Nineteenth Century: The Case of Tennyson's *The Princess*

It has been said by its opponents that science divorces itself from literature; but the statement, like so many others, arises from lack of knowledge.

–John Tyndall, *The Belfast Address*, 1874

The purpose of the article is to describe the references to nineteenth century science in Alfred Tennyson's longer poem *The Princess* and to analyse their significance for the interpretation of the medley, as the poet himself called it. Tennyson's interest in scientific discoveries of his time and his attention to astronomy and geology in particular are explicitly declared in his later poem, where he refers to them as his "terrible Muses":

What be those two shapes high over the sacred fountain,  
Taller than all the Muses, and huger than all the mountain?  
On those two known peaks they stand ever spreading and heightening;  
Poet, that evergreen laurel is blasted by more than lightning! [. . .]  
These are Astronomy and Geology, terrible Muses! ("Parnassus," II, ll. 11–15)

The words of John Tyndall, a physicist and one of the greatest popularisers of science can be easily confirmed by the nineteenth century popular press, where scientific articles were printed side by side with poetry, fiction, and literary criticism. In the 1850 issues of Dickens's *Household Words*, one can find articles on alchemy and gunpowder, telegraphs, chronometer room of Greenwich observatory, chemical contradictions, Egyptian burial rites alongside sonnets, ballads and serialised novels (Dickens, online). Tyndall, like his other fellow scientists, was well aware that in order to be an effective communicator and win the respect and confidence of educated readers, he must display a thorough familiarity with the common cultural heritage and Western literary tradition. It was a frequent practise among nineteenth-century men of science to refer to well-known fiction and poetry of the past and the present and even make use of the recognisable story-telling techniques in order to communicate effectively with their readers. As James A. Secord has observed in his "Introduction" to Lyell's *Principles of Geology* (1830–33), Lyell "won a wide readership not just because he provided convincing evidence for gradual change but because he used literary references to Milton, Scott, and Wordsworth to present geology as a respectable, gentlemanly pursuit" (qtd. in Otis xix). It is thus no surprise that numerous novelists and poets of the period explored important scientific issues of the

day in their works, which were often preceded by very thorough research, for instance George Eliot, Thomas Hardy, Charles Dickens, H.G. Wells, Gerard Manley Hopkins, Charlotte Brontë, Robert Louis Stevenson, Sir Arthur Conan Doyle and Alfred Tennyson, to name only a few.

The purpose of the article is to describe the references to nineteenth century science in Alfred Tennyson's long poem *The Princess* and to analyse their significance for the interpretation of the "medley," as the poet himself called it. Tennyson's avid interest and minute knowledge of science in various fields was frequently stressed by a group of influential scientists who were the poet's friends during more than thirty years of his life. His close acquaintances included Charles Darwin (whose *Origin of Species* Tennyson bought and read soon after its publication in 1859), physicist John Tyndall, biologist Thomas Huxley, paleontologist Richard Owen, and three astronomers Charles Pritchard, Sir John Herschel and Sir Norman Lockyer. The poet had been a fellow of the Royal Society since 1865 and in 1869 together with fellows scientists founded the Metaphysical Society. According to John Huxley, Tennyson was "the only modern poet, in fact the only poet since the time of Lucretius, who has taken the trouble to understand the work and tendency of the men of science" (qtd. in Pinion 235). In his recollections of the poet, astronomer Norman Lockyer stressed Tennyson's unceasing interest in scientific controversies of his time: "The last time I met him (July 1892), he would talk of nothing but the possible ages of the sun and earth, and was eager to know to which estimates scientific opinion was then veering" (286). Hallam Tennyson's *Memoir* records the poet's eagerness to obtain a controversial tract, which, although inaccurate, offered one of the first theories of evolution after its appearance in 1844. The poet wrote to his publisher, saying: "I want you to get me a book which I see advertised in the *Examiner*: it seems to contain many speculations with which I have been familiar for years, and on which I have written more than one poem. The book is called *Vestiges of the Natural History of Creation*" (Tennyson, H. vol. I, 222–223). It seems that Tennyson's poetry can be even regarded as promoting and explaining scientific knowledge among its readers considering such a sincere confession on the first reading of *In Memoriam*:

I was quite entirely ignorant and indifferent in those days about all poetry, did not in the least know or guess who had written it, but, opening it haphazard at Geological Stanzas, was so impressed and riveted by them [. . .] that I could not put the book down until I had read all through from end to end. I was caught up and enthralled by its spirit, and my eyes seemed suddenly opened on a whole new world. (Knowles 246)

One of his Victorian admirers referred to the Laureate as "the Poet of Science" since the world in his poems is always the world intermingled with the discoveries of his age, the scientific view of it dominates; science permeates all Tennyson's poetic language: metaphors, similes, imagery just like the newest scientific inventions and geological findings filled Sir Walter Vivian's garden in *The Princess* (Lodge 280).

Gardens and their literary representations have frequently been interpreted as reflections of their age, depicting both its ideals and unprecedented social, cultural, and political changes. Tennyson's *The Princess* is set in the frame of Sir Walter Vivian's garden which was thrown open to the local tenants for one summer's day. Apart from "the house, Greek,

set with busts" (l. 11) and "Carved stones of the Abbey-ruin" (l. 14), the visitors could admire the flat fossil shells of an extinct mollusk from the Cretaceous Period and other natural curiosities displayed on the garden pavement:

Huge Ammonites and the first bones of Time;  
 And on the tables every clime and age  
 Jumbled together; celts and calumets,  
 Claymore and snow-shoe, toys in lava, fans  
 Of sandal, amber, ancient rosaries,  
 Laborious orient ivory sphere in sphere.  
 (Tennyson, A. ll. 15–20)

Instead of idyllic lawns and the beauties of nature transformed, Sir Walter's garden is brimming with machines and the latest technological inventions, which are described by the narrator with equal admiration to the natural beauties of the earlier literary gardens. The baronet, a patron of the local Mechanical Institute, has lent his garden to organize an exhibition of scientific achievements and technological inventions of the age in a manner of the Crystal Palace so that "sport / Went hand in hand with science" (ll. 79–80). Among mechanical fountains, cannons, telescopes, devices producing electric shock, "a little clock-work steamer" (l. 71), "a fire-balloon" (l. 75), "twenty posts of telegraph" (l. 77), children "roll'd about / Like tumbled fruit in grass; and men and maids / Arranged a country dance" (ll. 82–84). The noises of scientific experiments harmoniously merge with the "twangling violin" (l. 86) and the noises of bees and "broad ambrosial aisles of lofty lime" (l. 87). Science and technology do not appear as something alien and discordant with the country garden, but something that seems to be a natural component of this Victorian Eden. The portrayal of Sir Walter's garden seems to follow the literary convention of *locus amoneus*, an idealised place of safety, comfort, and happiness with connotations of Eden or Elysium. After satiating himself with the sight, the speaker sees the baronet's garden as an expression of high civilisation, humane values and scientific pursuits of its master:

For me, the genial day, the happy crowd,  
 The sport half-science, fill me with a faith,  
 This fine old world of ours is but a child  
 Yet in the go-cart. Patience! Give it time  
 To learn its limbs; there is a hand that guides. (Conc. ll. 75–79)

Sir Walter seems to be well aware of the fact that the idea of the educated man has changed in his time. The aristocratic pedigree and traditional curriculum of Greek and Latin literature must be supplemented with scientific pursuits in order to gain respect and popularity, or even enter upon a successful political career with applause "more joyful than the city-roar that hails / Premier or king!" (Conc. ll. 101–102). Such a view on education was expressed by Tennyson's friend, Thomas Henry Huxley, at the opening of a science college for middle-and-working class students: "for the purpose of attaining real culture, an exclusively scientific education is at least as effectual as an exclusively literary education" (5).

Within the frame of Sir Walter's garden there is an imaginary garden attached to the "University for maidens" (I, l. 149) founded by the eponymous Princess Ida. Princess Ida is an ardent believer that the first step to change the disadvantageous position of women in the world is proper education hence "two great statues, Art / And Science" guard the portals of her garden (IV, ll. 182–183). Similarly to Sir Walter Vivian, Tennyson himself and a number of the poet's contemporaries, the Princess perceives knowledge, education and an interest in scientific discoveries as a primary stamp of an educated man. Through scientific pursuits one can gain a new insight into the world and intellectual independence, but women in particular may prove their intellectual equality:

O, lift your natures up;  
Embrace our aims; work out your freedom. Girls,  
Knowledge is now no more a fountain seal'd!  
Drink deep, until the habits of the slave,  
The sins of emptiness, gossip and spite  
And slander, die. (II, ll. 74–79)

It is at Ida's university that the three disguised young men listen for the first time to the lecture on the so-called "nebular hypothesis" of the Laplacean cosmology which was never in better repute among astronomers than in 1847, when *The Princess* was published:

"This world was once a fluid haze of light,  
Till towards the centre set the starry tides,  
And eddied into suns, that wheeling cast  
The planets; [ . . .]" (II, ll. 101–104)

In a similar manner Princess Ida refers to the sun at the beginning of Canto IV: "There sinks the nebulous star we call the sun, / If that hypothesis of theirs be sound" (ll. 1–2). According to Hallam Tennyson, whenever his father prepared a re-issue of his poem he was particularly anxious that any reference to science be true to the recent scientific knowledge. Hence while Hallam was compiling the 1892 edition of his father's *Works*, the poet asked his friend Sir Joseph Norman Lockyer, one of the most renowned solar astronomers of the day, whether "nebulous" was still regarded as a proper description of the sun at that time and presented his son with the following note: "Norman Lockyer says that this is a true description of the sun. [ . . . ] Our sun is a remnant, has been 'shaped' out of nebula" (qtd. in Hill 160). The nebular hypothesis seems to be of particular importance for the young Princess's mission. By the 1840s, Lord Kelvin and James Maxwell had formulated the second law of thermodynamics, known as entropy, which implied that due to the inevitable dissipation of heat the sun as a gaseous nebula was destined to exhaust its energy and disappear. "A sad astrology," laments the speaker of "Maud" (l. 633), but for the Princess it could be extremely liberating. She indents to teach women to "lose Convention" (I. 70) and acquire enough courage to change their perception of deeply ingrained traditions and stereotypes enslaving female kind. The implication is clear: if the sun is not permanent, the same can apply to all received human dogmas. Thus "natural philosophy," as science was then termed, could help to better comprehend one's place and role in the microcosm of one's life.

Lyell's *Principles of Geology* provided the poet with new metaphors for impermanence and change. In *The Princess* the fossilised species are symbols of the necessity of change in outdated narrow ways of thinking that should die out since they are no longer valid in the modern world. The young Prince makes the following geological analogy to dissuade his father from the idea of war and brutal force as the best solution to change Ida's resolution:

"I would the old god of war himself were dead,  
 Forgotten, rusting on his iron hills,  
 Rotting on some wild shore with ribs of wreck,  
 Or like an old-world mammoth bulk'd in ice,  
 Not to be molten out." (V, ll. 139–143)

Instead of purposelessly admiring the beauties of nature, the Princess organizes a geological expedition "to take / the dip of certain strata to the north" like many a scientific Victorian gentleman (III, ll. 153–154). There, among "hammering and clinking, chattering stony names / Of shale and hornblade, rag and trap and tuff, / Amygdaloid and trachyte" romance and flirtation go hand in hand with science (III, ll. 343–345). The noise of geological hammers turns out to be a perfect setting for falling in love since scientific pursuit seems to be part of the inherent spirit of the poem and one of natural characteristics of its time. The Prince, Princess Ida, Cyril, Psyche, Florian, and Melissa do not seem to share John Ruskin's adverse contention about it: "If only the Geologists would let me alone, I could do very well, but those dreadful hammers! I hear the clink of them at the end of every cadence of the Bible verses" (qtd. in Atwood 23).

Last but not least, one cannot ignore the significant influence of Darwin's two seminal works: *On the Origin of Species by Means of Natural Selection* (1859) and *The Descent of Man, and Selection in Relation to Sex* (1871), which is most visible in the biological reasons behind the Prince's selection of a future mate. To explain his attraction to Princess Ida, the young man makes an analogy of the distinctions between various species of birds, he and Ida belonging to the same species: "The crane [. . .] may chatter of the crane, / The dove may murmur of the dove, but I / An eagle clang an eagle to the sphere" (III, ll. 88–90). The king, his father, makes a point of the Princess's particular suitability as a strong vigorous female to enlarge and strengthen his family with almost Darwinian terminology: "Stubborn, but she may sit / Upon a king's right hand in thunderstorms, / And breed up warriors!" (V, ll. 428–430).

After the publication of his two-volume *Poems* in 1842 the reviewers bewailed young Tennyson's "deadness to ordinary human interests" (qtd. in Jump 99). "Mr. Tennyson has not yet become *human* enough for our cravings," complained Francis Garden, an old Cambridge acquaintance, in *Christian Remembrancer* (qtd. in Jump 98). Contemporary readers want poets to be "in a good sense, men of the world, practical men, capable of ordinary business-like exertion of every sort, – stirred by domestic and public interests" and not "set of dreamers" (qtd. in Jump 99). Likewise, in *Quarterly Review* of September 1842, John Sterling, a leading member of the Cambridge Apostles, urged Tennyson to capture the variety, contrasts, and potential of his time – "the real world as it lies before us today" (qtd. in Jump 125). Shakespeare and Chaucer were given as prime examples of such an approach to art since they managed to reproduce whatever was essential in their

age. Judging from *The Princess* Tennyson did not remain deaf to the pleas of his readers. It has been discussed as “Tennyson’s eminently Shakespearean poem” and its poetic structure seems to invoke *Canterbury Tales* as a whole (Byrd Mantell 48). There is no doubt that the spirit of the age which the poet managed to render so meticulously in *The Princess* is heavily indebted to his frequent references to science and technological inventions. Astronomy, geology, biology, and physics created a fertile source of new rhetoric for the poet who became a key mediator between science and the public. Science in *The Princess* is not something abstruse and alien to ordinary commonplace existence of the average Victorian, but something amenable to human thought and feeling. *The Princess* is an apt example of a new role of poetry in the increasingly scientific age: conjoining the actual palpable feelings and wants with specialised knowledge, which could better articulate man’s relation to the world in the middle of the nineteenth century.

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### **Streszczenie**

Celem artykułu jest przeanalizowanie nawiązań do nauki i osiągnięć technicznych w utworze Alfreda Tennysona *The Princess* z 1847 roku. Świat przedstawiony w utworze obfituje w aluzje do dziewiętnastowiecznych odkryć geologicznych i do teorii ewolucji. Można w nim również znaleźć krótki wykład na temat powstania układu słonecznego z mgławicy gazowej Laplace'a. Skamieliny oraz dziewiętnastowieczne wynalazki techniczne są integralną częścią dwóch ogrodów przedstawionych w *The Princess*. Nauka i technika w utworze stanowią bogate źródło porównań i metafor, które pozwalają bohaterom lepiej zrozumieć nie tylko otaczający ich świat, ale i samych siebie.