Sir William Rowan Hamilton

Illnesses and Astronomy

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Abstract

Reading Graves' biography of Sir William Rowan Hamilton (1805-1865), which was published in 1882-1889, it can be seen that in his younger years Hamilton was a very fervent and good astronomer. But also, that he suffered from many colds and attacks of bronchitis; describing Hamilton's last weeks Graves wrote that "bronchitis supervened." Not in any way doubting Hamilton's great preference for pure mathematics, it goes too far too call him a reluctant or even bad practical astronomer. The standard observations in those days were mainly measuring star positions, but while being actually good at it, Hamilton's frequent colds after working in the dome made it almost impossible to continue such observing. Still, Hamilton always remained enthusiastic about special events such as eclipses, comets, and meteors, and spent much time answering questions of amateurs. In his famous astronomy lectures it can be seen that for him it remained awe inspiring, and even his 1853 book *Lectures on Quaternions* starts with astronomy.

1 Introduction

It has often been claimed that Hamilton was, to say the least, not a very enthusiastic practical astronomer. I had not doubted that conclusion when I first started on my Hamilton essay, and I therefore did not give much attention to it. But working on the sketch about Catherine Disney I had to reread Hamilton's early years as described in Graves' biography, and I noticed that there were more indications of illness and a weak health than I had realized. In what follows I will not give references, it can all be found in my Hamilton essay and in my biographical sketch about Catherine Disney, and in Graves' biography, which is arranged chronologically.

2 1807-1820. Early years, and Trim

In August 1807, the month in which Hamilton became two years old, his father Archibald went bankrupt. It had to do with what he had done for Archibald Hamilton Rowan, against whom he later won a lawsuit about money. But in the meantime the family's belongings had been publicly sold, from their "plated ware, china, delft, glass," up to their washing machine. A year later Hamilton and his elder sister Grace were living in Trim with their uncle James Hamilton, one of Archibald's brothers, and with their aunt Sydney, Archibald's sister. Graves did not know when exactly the children were brought to Trim; he assumed that the first letter Hamilton's aunt Sydney wrote to his mother from Trim, which is undated, was written on his third birthday.

Because there seems to be no further exact information about when and why the children were sent to Trim it has often been connected directly to the bankruptcy. Yet such a direct relation can be doubted; the family did not lose their house in Dominick Street, and Archibald and Sarah Hamilton thereafter raised five more children.[1] It is therefore perfectly possible that sending the children to Trim had nothing to do with the bankruptcy; it would be far more logical to accept that his parents sent Hamilton to Trim because uncle James was in a perfect position to take on the task of educating the very promising child, being schoolmaster of the Diocesan School in Trim. And that Grace came with him for company; the Hamiltons knew each other well and visited each other often, but neither uncle James nor aunt Sydney then had children of their own. Moreover, Eliza was still very young and Sarah Hamilton was pregnant again, and it may have been lonely for Grace to be without her lively brother; throughout their lives the Hamilton siblings were very attached to each other.

This is substantiated indirectly by Graves, who wrote that when Hamilton was only a month old his mother Sarah "reports, as being struck with something uncommon in its degree, that under the irritation of some infantile complaint he exhibited a placidity of temper not easily to be discomposed. [...] Her next report of him, written on the 23rd July of the following year [1806], when he was nearly a year old, was that he was a well-developed child and already walking stoutly. Not long after the last date his intellect must have shown itself to be remarkable, for it led to the decision on the part of his parents to commit without delay their child's education to the care of his uncle and his aunt Sydney at Trim. There is extant a series of letters from the latter to his mother, giving her an account of his progress; and beginning, as they do, in the month after he had attained his third year, they indicate that he had then been for some time an inmate in his uncle's house.[2] The wisdom of this measure was abundantly proved by the result, and it does credit not only to the sagacity but to the self-denial of his parents, that they could bring themselves, with a view to his ultimate advantage, so early to part with a child whose abilities would have ministered day by day equally to their pleasure and their pride."[3]

But there may have been yet another reason; Hamilton seems to have suffered regularly from bronchitis. For instance, when describing 1827 Graves mentioned Hamilton's "delicacy of chest" as a later problem with his observing in the dome and the meridian room at the observatory; describing his last year, 1865, that Hamilton suffered from a combination of gout, bronchitis, and other ailments; and that in Hamilton's last weeks "bronchitis supervened, and, with other ailments, led on to the inevitable close." That means that Hamilton's bronchitis may have been more or less chronic. Because the air in Dublin does not seem to have been very healthy overall, which was illustrated by Lady Pamela Campbell's description of "the smoke and stir of that dim spot which men call Dublin," a reason for sending Hamilton to Trim may have been that he suffered from the bad air in the city.

A confirmation thereof could be a sentence from a letter, written on 17 October 1808, when Hamilton was in Trim for a few months apparently, by aunt Sydney to Hamilton's

[1] Although two of them died young. The Hamilton children were: William (1801-1801); Grace (1802-1846); Archibald (1804-1804); William Rowan (1805-1865); Elizabeth Mary (1807-1851); Archibald (1809-..) (died early); Sydney Margaret (1810-1889); Sarah Susannah (1812-1817); Archianna Priscilla Hannah (1815-1860).

[2] In his biography describing time intervals of on average some weeks or months, depending on how interesting he judged events to be for his readers, with "some time' Graves would at the most indicate some months, and more likely only some weeks. That would be in accordance with his suggestion that the first, undated, letter was written on Hamilton's third birthday.

[3] There have been many reasons not to take Graves literally all the time, yet his omissions and concealments always had to do with love and marriage. Already having written about the bankruptcy, and that Archibald had to work away from home, there is hardly any reason not to take Graves literally now.

mother Sarah, "Your son and heir is, thank God, very well; indeed he looks better these few days than ever I saw him." Realizing that Trim was a small rural town with much fresh air, sending Hamilton to Trim to be educated sounds like a perfect decision for an extremely intelligent boy with bronchitis, for which there was no medication yet. Sarah and Archibald had already lost two children then; such an opportunity may have been very attractive for the worried parents. And they saw each other often, the Hamilton families visited each other very regularly.

In February 1814 uncle James married Elizabeth Boyle, in October that same year aunt Sydney died, [4] Hamilton's mother died in 1817, [5] and his father in 1819, [6] shortly after having married Anne Pollock Barlow. Thereafter Hamilton would often visit a cousin of Archibald, James and Sydney Hamilton, whom Hamilton called 'Cousin Arthur'. He seems to have become a father figure to Hamilton, who regularly met with his sisters at Cousin Arthur's house in Dublin.

3 1820-1823. Astronomy and illness

Describing 1820, when Hamilton was fifteen, Graves explicitly mentioned his interest in astronomy, especially eclipses; Hamilton then already possessed a telescope. He observed Jupiter's satellites and Saturn's ring, "but the occurrence of two lunar eclipses, one on the 29th March, and the other on the 22nd September, and of an intervening Solar Eclipse on the 7th September, [7] all visible at Trim, became of absorbing interest to him."

In February 1822, next to his studies Hamilton made calculations for the progress of an eclipse of the moon, as seen from Trim. [8] He rose around three o'clock and saw the eclipse, which agreed very well with his calculations. He also calculated the next eclipse early in August, for both Trim and Dublin, and twice observed the satellites of Jupiter, concluding that their configuration corresponded very well with that given in the Nautical Almanack.

In April 1822 Hamilton suffered from whooping-cough, yet that same month he was able to attend the funeral of his little cousin Kate, child of uncle James and aunt Elizabeth.[9] Graves then wrote: "His uncle's objections, on account of loss of time, to his accepting an invitation from his cousin [Arthur] to change the air by a visit to him having been overruled by the Doctor, Hamilton went up to Dublin early in May. The change was required, for he had been for some time forbidden to read, coughed much, and had to struggle with great difficulty of breathing." [10] According to Graves, going to Dublin proved "beneficial to

[4] Because Graves mentioned her being cared for by Hamilton's parents, aunt Sydney will have been the Miss Hamilton of Dominick Street who was buried on 28 October 1814, churchrecords.irishgenealogy.ie/churchrecords/display-pdf.jsp?pdfName=d-277-1-4-211.

[5] Died Saturday night 10 May 1817, buried on 13 May, Mrs. Archibald Hamilton of Dominick street, churchrecords.irishgenealogy.ie/churchrecords/display-pdf.jsp?pdfName=d-277-1-4-225.

[6] Buried on 12 Dec 1819, Archibald Hamilton Esq., of Dominick Street, churchrecords.irishgenealogy.ie/churchrecords/display-pdf.jsp?pdfName=d-277-1-4-238.

[7] The solar eclipse was partial, see *EclipseWise.com*, eclipsewise.com/solar/SEatlas/SEatlas2/SEatlas1801.GIF [accessed 24 May 2019].

[8] Hamilton's uncle John Willey, who had married Susan Hutton, one of his maternal aunts, was an amateur astronomer. Graves wrote, "he received [...] from his uncle Willey the plans and map of the central path of the moon's shadow over the earth, with Tables of various kinds, 'all most ingeniously, accurately, carefully, neatly, skilfully, obligingly, and beautifully executed,' as he records in his journal."

[9] Remarkably, Hamilton wrote that Kate was buried "by the side of her little brother and mine." Assuming that Kate was buried in Trim because there is no Dublin burial record, his parents apparently had even closer bonds to Trim than appeared from letters given by Graves.

[10] Sending Hamilton to Dublin seems to contradict the idea of the city's bad air, yet from the context it can be seen that the benefit will have come from changing surroundings or even, having been forbidden te read, being away from his uncle's pressures for a while. These pressures will generally not have been a

his health;" Hamilton resumed his studies and, amongst others, wrote a short paper about chronology in the Aeneid which again included astronomical calculations, and he read the Mécanique Céleste of Laplace. Finding a "flaw in the reasoning by which Laplace demonstrates the parallelogram of forces" brought him in contact with Dr. Brinkley, who then was Royal Astronomer of Ireland and therefore lived at Dunsink Observatory.

In September 1822 Hamilton mentioned, in a letter to Cousin Arthur written from Trim, that in the beginning of 1821 having bought an Ephemeris, his "favourite amusement was calculating and observing occultations of stars by the moon; eclipses too, but there were not any to observe." Then he gave his attention to mathematical reading and Newton's *Principia*, yet having received two Nautical Almanacks, they gave him "a new impulse to observe the heavenly bodies."

4 1822-1823. Illness and TCD

It had apparently been planned that Hamilton would enter TCD in the spring of 1823, but referring to a letter written in October 1822 Graves wrote, "The following letter [to Eliza] announces the postponement till the summer of the next year of his entrance into College. This decision was arrived at after much discussion between his uncle and his Cousin Arthur, the determining motive being the state of his health, which during the spring and the summer had caused much uneasiness." In the letter to Eliza Hamilton wrote, "We shall probably not meet until Christmas, as I am not to enter College till next July, which is a disappointment to us both. ... The Sunday before last I received what is justly styled in our Liturgy "the most comfortable Sacrament of the Body and Blood of Christ." I had been prevented by my cough from attending at several returns of that holy ordinance, and even from joining at all in public worship. I am convinced that the precept is wise which enjoins us not to forsake the assembling of ourselves together."

In January 1823 Hamilton confirmed to Eliza that he would enter TCD in July, and wrote that although he would be very busy preparing himself, he had to tell her about "the eclipse of the moon, last Sunday evening. I had made calculations of all the circumstances six months ago, and I showed them to uncle as soon as dinner was over. He wrote a note to ask Mr. Butler and his brother to come to observe, and drink tea; they came, but not till all was nearly over. When the time of emersion approached, for the moon was totally eclipsed, I went out to the garden: the stars and planets were glowing, but their queen was absent. I sought her, but her place was nowhere to be found. Shortly afterwards, I saw through my telescope the first Satellite of Jupiter and knew that the emersion of the moon must have taken place. For it is a remarkable coincidence that Jupiter's moon emerged from a total eclipse only three minutes and a-half before ours did. At the same time Saturn was on the meridian, [11] and in some parts of the world the moon was seen to cover a small star while itself totally eclipsed. So I think an astrologer would say something wonderful was portended. I went out and saw that the moon had just begun to emerge. What then must have been the feelings of one who worshipped the host of heaven, and knew not that their motions were reduced to calculation! For myself, as I gazed, my delight was blended with awe. That instant, I observed a falling star, and the circumstance struck me. I observed a similar one during the last eclipse of the moon, and told Cousin Arthur that the heavens seemed to sympathise in commotion with the astonished earth. [...] The shadow of the earth went rapidly off the moon, moving apparently in a north-west direction, as I had calculated, such as this /. The whole course of emerging from total darkness to perfect light did not occupy an hour. It

problem for Hamilton, but they may have been under these circumstances.

[11] That means that Saturn was exactly in the south.

was interesting to observe the gradual increase of the moonlight on the scenery. At last the shadow vent off entirely, to wander through space until the 23rd of July, when it will again cause a total eclipse."

In February Hamilton wrote to Cousin Arthur, "I observed, four weeks ago, that while part of the moon was still under the eclipse the centre was less visible than the circumference. Since that time I have found an adequate cause of the phenomenon in the rarity of the lunar atmosphere. In the sun, on the contrary, which has a dense atmosphere, it is ascertained that the centre is brighter than the circumference. [...] Another thing that struck me was the near coincidence in point of time between the eclipse of our moon and that of the first Satellite of Jupiter. By an investigation founded on the successive propagation of light, I ascertained that there were places (not in this earth) at which the emersion of Jupiter's moon and the middle of the eclipse of ours would have appeared to synchronise, and also that these places are all contained in a hyperboloid of revolution, Jupiter being in one focus, the earth in the other, and the axis equal to the space that light traverses in the difference of the times of the phenomena: about ninety millions of miles. The result is remarkable."

In April 1823 Hamilton mentioned in a letter to Eliza that he had "a cold, as usual." In May he wrote to Cousin Arthur that he had visited Dunsink Observatory, and had forgotten to tell him "one thing about the Pole star. When I saw it through the telescope, to my great surprise I observed it move from west to east, and cried out "It is going wrong!" Doctor Brinkley was amused, and explained that the telescope inverted objects. He also remarked that the Pole star moves with about thirty times less velocity than one in the Equator."

On the last day of May Hamilton mentioned to have made a curious discovery in Optics, and Graves suggested that he was referring to his 'Characteristic Function.' Graves continued, "On the 7th of July, 1823, preceded by rumours, not unfounded, of the intellectual prowess of 'Hamilton the Prodigy,' he made his appearance in the courts of Trinity College, and underwent the Entrance Examination. As was expected, he came out first of one hundred candidates, and on the next day obtained a premium [12] for his answering at an examination in Hebrew."

College apparently did not start immediately after Entrance, but after the summer holidays. In July Hamilton again visited Brinkley at the observatory, mentioned the upcoming eclipse of the moon in a letter to Eliza, and on the day of the eclipse, 23 July 1823, he wrote the 'Ode to the Moon under total eclipse'. He made excursions, for instance to the Dargle river, and in September he finally started his "life as a Student."

5 1823-1824. College and Catherine Disney

In the next two sections much attention is given to Hamilton's grades, to be able to show that, even though it was very difficult for him, his grades were hardly influenced by 'losing' Catherine Disney, as has been claimed. These claims in turn overshadowed the fact that in the Winter of 1825-1826 Hamilton was really very ill.

According to Graves, "the first year of Hamilton's college career justified all the expectations entertained by his friends, and foreshowed the intellectual altitude he was destined to attain. It was one of unprecedented success. At the first, or Hilary, examination [January 1824] he gained both premiums, and about the same time was awarded a Chancellor's Prize

[12] According to Graves, obtaining a premium means to have been "the best answerer."

for his Poem on the subject of 'The Ionian Islands'. At each of the three subsequent examinations [13] he obtained both certificates [for Science and the Classics]; but at the examination in Trinity Term a still higher honour was conferred upon him by the examiner in Classics, Dr. Elrington, awarding the judgment of optime to his answering in Homer. [...] The honour on this occasion was entirely unexpected by Hamilton. [14] It was also at the commencement of this summer that he received a second Chancellor's Prize for his poem 'Eustace de St. Pierre', the subject being the well-known incident in the Siege of Calais. These two prize poems [are] written in different styles, but both more spirited and impulsive than is ordinarily the case with compositions of the same class."

In August 1824, just having started on his second college year, Hamilton met Catherine Disney at Summerhill, and fell deeply in love with her. Also in August he learned to know Maria Edgeworth, having visited Edgeworthstown with his uncle. In September he was preparing for examinations while also working on his 'curious discovery in Optics.'

Having visited the Disneys very regularly, and having fallen even deeper in love, in February 1825 Hamilton wrote a Valentine poem for Catherine. But very shortly thereafter, still in February, [15] he "had to suffer [a disappointment] which fell with crushing weight upon his heart and spirits. He learned quite unexpectedly from the lips of her mother that the lovely object of his passionate admiration was claimed as bride by an elder suitor, and that her marriage would shortly take place." [16] It clearly came as a total shock, yet in March Hamilton won a premium for the Catechetical Examinations, having been lent several books by for instance Edward and James Disney, two of Catherine's brothers. He was able to provide the sought after answers to questions regarding the standstill of the sun in Canaan just after sunrise, leading to the long night in Greece preceding the birth of Hercules, and why that did not disrupt the systems of Astronomy. He received the premium "as well for regularity of attendance as for goodness of answering."

Just before Easter, which in 1825 fell on the 3rd of April, Hamilton was "occupied in scientific pursuits and projects," leading uncle James to express "some misgiving [...] as to whether he was doing justice to his Classical preparation." Uncle James was right; in the Easter Examination Hamilton received lower grades than usual, which has often been taken as a sign that Hamilton was in distress over having lost Catherine. That he had a very difficult time was of course true, but there was clearly more to his receiving lower grades, because both his answering in Science and his theme in the Classics were graded as highly as usual. [17]

Graves explained, "What occurred at the Examination [...] was, that while [Hamilton's] success in Science was what it always had been, Mr. Kennedy, as his Examiner in

[13] Graves wrote, "At the time of Hamilton's passing through Trinity College, terminal examinations were held there four times in each year." Premiums were given to a student only once a year, thereafter the student would receive a certificate. It was apparently due to the fact that the premium was accompanied by "books to a certain value to be obtained from the University Bookseller."

[14] In October 1823 Hamilton had written to Eliza, "One thing only have I to regret in the direction of my studies, that they should be diverted or rather, rudely forced by the College Course from their natural bent and favourite channel. That bent, you know, is Science – Science in its most exalted heights, in its most secret recesses. It has so captivated me – so seized on, I may say, my affections – that my attention to Classical studies is an effort, and an irksome one. And I own that before I entered College, I did not hope that in them I would rise above mediocrity. My success surprised me; but it has also given me a spur, by holding out a prospect that even in the less agreeable part of my business I may hope still to succeed."

[15] In my sketch of Catherine Disney's life I have suggested that there was a connection between Hamilton's Valentine poem and the family's decision to 'marry her off' quickly.

[16] Catherine married on the 5th of May 1825.

[17] Of course, having given more attention to Science than to the Classics, and therefore receiving a lower grade, may have been influenced by his "disappointment"; it may have been easier for him to become engulfed in Science and forget everything else, than in the Classics, see footnote 14 on p. 6.

Classics,[18] gave the secondary judgment of bene to his answering in both Greek and Latin authors,[19] appending to his theme the usual valde bene; but Mr. Kennedy was not content with this amount of depression of Hamilton's established character as a Classical scholar; he went so far as to stop, as it was called, the Classical Certificate in the division; thus intimating that neither Hamilton nor his competitors for the honour had reached the standard of positive merit required. He also withheld the Classical Premium from the division. This decision of the Examiner was loudly exclaimed against at the time. Mr. Kennedy's character protected him from all dishonouring imputations; but his Examination was freely charged with unreasonableness, and it was moreover averred that, persuaded as he was that no Examiner in College was qualified to give an optime in Greek but himself, the remembrance of this honour having been conferred on Hamilton by another, and in a subject, the Iliad of Homer, which he had made his own by publishing an edition of the work, had brought him down upon the distinguished Undergraduate, animated by a personal feeling which caused actual, though it might be unconscious, unfairness. However, we have seen that Hamilton's preparation in Classics had not been careful, and he wisely took his disappointment without a murmur as an admonition for his future guidance."

And in a footnote Graves added, "By reference to the Examination books in Trinity College, I have verified the fact of the stoppage both of Certificate and Premium; and it is certainly remarkable that not only Hamilton, but several other students in this division, who both before and after this Examination uniformly obtained valdes in Classics, suffered on this occasion the same depression of their judgments as he did: I may name Halliday, who subsequently obtained the Classical Medal in his class, and Bartholomew Lloyd, brother of the late Provost."[20]

6 1824-1827. Catherine Disney, exams, and illness

Making Graves' biography sometimes hard to grasp is that it is mostly chronological but not always. Although this Examination happened in April 1825, Graves next combined this disappointment about the grades to the disappointment of hearing about Catherine's marriage, on the one hand by mentioning these disappointments in one sentence, and on the other by mentioning Hamilton's having been told about the marriage after his report about the Examinations instead of before.

Thereafter Graves gave the poem 'The Enthusiast', which was written in January 1826, in which Hamilton described how happy he had been with his Science and with loving Catherine, and how losing her had left him "darkly changed." In a footnote Graves then added that Hamilton wrote in 1853, "'The Enthusiast' was composed on a sick bed, during almost the only time of serious illness that I can remember, and one brought on chiefly by brooding on that youthful grief, notwithstanding great and successful efforts to maintain a high (indeed at that time brilliant) reputation in my own University. The gloom described at the close is therefore not a fair description, or anticipation, of my subsequent life."

After having given the 1826 poem 'The Enthusiast', Graves gave the poem 'A Farewell' which was written in May 1825. In the poem Hamilton wrote that he had not felt able to attend Catherine's wedding, but that he wished her a very happy life. Graves commented, "It was well for Hamilton that the calls upon him for intellectual exertion were imperative, allowing of no remission, of no brooding over sorrow. He sedulously prepared himself at Trim

[18] Mr. Kennedy had also been the examiner in the Catechetical Examinations.

[19] The degrees were: optime, valde bene, bene, satis bene, mediocriter bene, vix mediocriter bene. The last grade would now be called unsatisfactory, thus failing the exam.

[20] Humphrey Lloyd died in 1881, Graves published the first volume of the biography in 1882.

for the June Examination [1825], in which his old success attended him, valde in omnibus, and the two Certificates in Science and Classics." From which it can be inferred that Hamilton then indeed already had learned what he tried to do for the next six years: work hard and "maintain his philosophical calm."[21]

But only when having arrived at the descriptions about the end of the year 1825, therefore thirteen pages after having mentioned the illness in connection to the poem 'The Enthusiast' and thus leaving the suggestion that it had mainly been psychosomatic, Graves wrote that Hamilton's illness was serious. "Concerning the end of the year 1825, little information is supplied by the correspondence in my hands. It is certain that he went in at the October Examination [1825], and obtained both Certificates, though with a bene for theme; and from letters in the early part of the succeeding year, and from the fact that he did not present himself at the January Examination [1826], it appears that in the first half of the winter he must have been seriously out of health. Indeed in one of the 'Stanley Papers' he refers to his indisposition as a 'long and painful illness.' It is not to be wondered at that the strain upon heart and mind which he had undergone should have told upon him."

In this last sentence again putting emphasis on the connection between losing Catherine and the illness, Graves may have intended to show Hamilton's distress over Catherine without saying it too explicit. But although he had literally mentioned "no brooding over sorrow," by writing the biography as he did, allowing for such concealments and achronologicality and combining Hamilton's lower grades, the sad poem and the illness, he left much room for speculation about many months of melancholy, causing Hamilton's health to deteriorate.

Yet even if Hamilton had been brooding and therewith weakened his health, only after the addition that it had been a 'long and painful illness' it can be seen that it was not just a depression of some sort. In those days many people often became very ill and many people died young, even while happy. Moreover, in that same year Hamilton met Arabella Lawrence, to whom he wrote a very open letter about his love for poetry and fascination and passion for science; he was not just brooding or melancholic for months on end.

In April 1826 Hamilton received his second optime;[22] "As the former optime [1824] was conferred upon his answering in Greek, this was gained by his mastery in Mathematical Physics, as exhibited in an examination conducted by Mr. Boyton, a scholar of high reputation in this department, and therefore justified in thus signalising the answering of a student. It gave to Hamilton the unique distinction of having obtained two such judgments, a distinction rendered the more remarkable by the fact that one was in Classics, the other in Science. He now became a celebrity in the intellectual circle of Dublin; and invitations, embarrassing from their number, poured in upon him, but he had strength of character sufficient to keep him from yielding to seductions of this kind, and he remained throughout his Collegiate course the steadily industrious student which he had been before. Not that he did not enjoy society and companionship: he was cheerful and sympathetic, and perfectly free alike from affectation and from conceit."

On the 7th of June 1826 Hamilton wrote a poem which shows that having lost Catherine was still very difficult; it sounds as if he tried to soothe himself. But it also shows that he did not have the slightest idea about Catherine having been forced to marry Barlow,

> Peace be around thee, wherever thou goest;
> Happiness still o'er thy bright path hover!

[21] For how he discovered how to handle such feelings see p. 10.

[22] About the optime Graves had written, "Valde bene was the judgment bestowed upon thoroughly good answering. Of the judgment optime, only to be thought of when the Student appeared by his answering to have proved his complete mastery of the subject, the examples were very rare."

Nor aught of gloom or of sorrow come
The sunshine of thy young days to cover!
All gladness go with thee, all bliss that springs
From a mind at ease, in pure thoughts dwelling;
And rich be thy home with undying joys
From wedded Love's holy fountain welling!

And yet, oh yet! not quite forgotten
Be *he* to whom thou wert a light so long;
A thought that was twined with his fondest musings,
His early dream, his fount of song!
Who, though once to thy heart, to thy love, he aspired,
Now asks but a passing thought from thee;
Remember me as a brother *only*:
But yet, as a brother, *remember* me!

But may peace be around thee, wherever thou goest!
May happiness still o'er thy bright path hover!
Nor aught of gloom or of sorrow come
The sunshine of thy young days to cover!
May thy home be rich with the still-new joys
From wedded Love's holy fountain welling,
And thy heart be a shrine for the bliss that springs
From a tranquil mind, in pure thoughts dwelling!

6.1 1825-1826 in chronological order

If the events of 1825-1826 are placed chronologically it can more easily be seen that Hamilton's lower grades were not so directly related to losing Catherine as they seemed to be. To which it should be added that 'lower grades' only meant not the highest grades; also benes were of course very good grades. Another reason for placing it in chronological order is that it shows that the emphasis on the connection between the illness and losing Catherine diverted the attention away from the fact that Hamilton indeed did not have such a stable health as he seems to have had when the biography is read superficially; several times he was indeed very seriously ill, and as mentioned, his bronchitis may have been chronic.

On the 14th of February 1825 Hamilton wrote the Valentine poem for Catherine, between 14th and 28th of February he heard that she was claimed as a bride. In March he won a premium for the Catechetical Examinations, in April he received his usual high grades both for Science and for his theme in Classics, but 'only' benes for Greek and Latin Authors. In May 1825 he wrote the poem 'A Farewell', in the June Examinations he again received his usual very high grades, similarly in the October Examinations, but then, next to both Certificates,[23] he received a bene for theme.

In the first half of the Winter of 1825-1826 Hamilton suffered from a "long and painful illness." He did not attend the January Examinations of 1826, and wrote the poem 'The Enthusiast' on his sickbed. In April he received his second Optime, and on the 7th of June he wrote the poem in which he wished Catherine a peaceful and happy life.

[23] Graves wrote, "A Student could obtain only one premium [...] in each year: if after having obtained a premium he came out at a succeeding examination as the best answerer in his division, he was given a Certificate stating the fact."

Before discussing the 1853 remark concerning the poem 'The Enthusiast', something must be said. In the summer of 1832, having been rejected by Ellen de Vere, the second woman he had fallen in love with, and having become quite unhealthy again by brooding for some months, Hamilton discovered how to handle his feelings of "gloom and languor." He wrote to De Vere that "a great revolution in my feelings has taken place." Through the 'revival of the power of hope,' his increased health 'of body and mind' led to his discovery of conical refraction for which he would be knighted, and to his falling in love with Helen Bayly, with whom he would marry in 1833.

Hamilton made his remark about 'The Enthusiast' in 1853, only some weeks after Catherine's death and therefore shortly after having heard for the first time that she had also loved him but had been coerced into the marriage with Barlow; obviously again a very difficult time. Then regarding this remark in the light of this 1832 discovery, a discovery he more than once referred to in later years, it can be seen that, rather than some loose thought, the remark about 'The Enthusiast' may have been a contemplation about how unable he had been in his younger years, before his 1832 discovery, to handle such feelings.

Yet Graves does not seem to have recognized the importance of this 1832 discovery, probably because very soon thereafter, in 1833, he left for England, and they did not see each other frequently any more. Graves thus may have kept the image of Hamilton as he had known him, as having been prone to melancholy and brooding over sorrow.

7 1827-1865. Illnesses and astronomy in later years

In the meantime Hamilton had also worked on his earlier mentioned 'curious discovery in Optics' which he had made when he was seventeen; it led to his 'Account of a Theory of Systems of Rays' which he presented to the Royal Irish Academy on the 23rd of April 1827.[24] Having become a regular visitor at the observatory, and knowing how good he was in both optics and astronomy, it was not at all too strange that in 1827, only twenty-one years old, he was nominated for the post of Royal Astronomer of Ireland. He was unanimously elected for the professorship in June, and in October 1827 he moved into Dunsink Observatory.

Hamilton seems to have been quite serious about becoming a good astronomer; for instance in December 1827 Hamilton wrote to Wordsworth that he had been up all night, observing. Yet Graves starts the description of the year 1828 with a telling sentence. "The commencement of Hamilton's practice as an Observer rather seriously affected his health. He suffered from constant cold in head and chest, and was much of his time confined to the house. He, notwithstanding, persevered in the occupations of the meridian-room, at this time rendered more trying by roof-shutters out of gear. This perseverance is proved by an active correspondence which began in the early part of 1828, between him and Dr. Robinson [of Armagh Observatory] exchanging observations of moon-culminating stars, with a view to determine the difference of longitude between Dunsink and Armagh. He was also employed in preparing for the printer the conclusion of his Essay on Systems of Rays by expanding some of the discussions. At length intermission of study, and to this end change of scene, became evidently necessary; and as his friends both at Armagh and Edgeworthstown had been competing for him as a guest, he acted successively upon their invitations. At Armagh he could scarcely have escaped more observing than he was fit for; and therefore, though feeling that the second half of his visit to his brother-Professor was an outstanding debt, he gave precedence to Edgeworthstown."

Early in April 1828 having returned to the Observatory, Hamilton had been "restored in health and spirit." In May 1828 he wrote to Robinson, "I have been star-gazing a good deal,

[24] It would in turn lead to what is now called 'Hamiltonian mechanics'.

I scarcely dare to say observing, but I find my interest in practical astronomy [returning] gradually on me, and I am sure that as soon as I can hope to be of any use to Science by my observations, I shall not [grudge] any labour or shrink from any exertion. My Essay [about Systems of Rays] has been quite finished for some time, at least the First Part of it, so far as depended on my own revisions. ... Airy [of Greenwich Observatory] says in his last letter, which he dates from the Observatory of Cambridge [...], that he will perhaps think it necessary for his astronomical education to revisit my Observatory, a remark which I may with much greater truth [apply] to my deferred visit to Armagh."

In October 1828 Hamilton wrote to Robinson, "I have been busy observing and calculating, which I am beginning to take a great interest in. I am sorry to hear that your children have the whooping-cough; but it is better for Tommy to have it now than when he is about to enter College, as was the case with me." But Hamilton's health was again not good; in December 1828 Robinson wrote, "I am glad to hear so good an account of your Lectures [on Astronomy], [25] and regret that I could not hear one of them for the pleasure of seeing my expectations so perfectly fulfilled. Good-bye, and go to bed and rise early, for I hear you are not as well as everyone who knows you will wish you to be. The intemperance of study is as fatal as any other, or even more so, for it cuts off only the noblest of our race."

Hamilton indeed observed regularly; in May 1829 he wrote to his aunt Mary Hutton, "A line to tell you that, having had a good deal of observation for some time past, I always muffle myself up, and have found your dressing-gown very comfortable. I cannot say so much for the beautiful fur cap, which, as well as my hat and college cap, I find badly suited for hard work. In their stead I wear a night-cap, and over it a Welsh wig, which make me a comical figure." And by 1831 Hamilton was so used to the telescope that he wrote to Grace, "While I am on the subject of blunders, I must give you [one], for the benefit of Eliza's collection. While wandering on our steamer on Lough Derg, [...] I cast my eye on the nearest vessel of the chain which we were towing after us, and read its number as 189. In truth it was 681; but my eyes, accustomed to inverting telescopes, made this my optical blunder."

But also in 1831 Hamilton wrote to Robinson, "My tastes, as you know, are decidedly mathematical rather than physical, and I dislike observing; which circumstance makes me rather unfit for holding an Observatory as a contemporary and compatriot of you." Robinson answered that for instance Encke, after whom a comet is named, hated observing, and that Hamilton's assistant Thompson could do the observations. Realizing that in those days the usual observations were to determine star positions and the exact time of day; observations which were always the same, makes it easy to imagine that that was not very attractive for someone like Hamilton. After 1831 the correspondence with Robinson diminished, and Hamilton's sisters Sydney and Grace seem to have done the larger parts of the observations. Hamilton wrote to Robinson in January 1832, "My eldest sister has grown quite a diligent observer, and she makes also a good many of the easier reductions herself."

Still, he lectured on Astronomy, and even as late as 1838 he was involved in a project with Robinson to determine "the longitude of the Observatories of Armagh and Dublin, respectively, by the method of Chronometers," and later by "rocket-signals." Indeed, throughout his life he remained to be enthusiastic about comets, meteors, and eclipses, he visited Lord Rosse and his large telescopes at Birr Castle, he explained the grinding process of the mirrors to his wife, he held open days for the public at the observatory, and he spent very much time explaining astronomy to amateurs. He answered very many questions, gave evening lectures at people's homes, and helped, for instance, Mary Ward when she wrote

[25] Only in 1830 Hamilton started his famous series of Introductory Lectures on Astronomy. They attracted "crowded audiences, in which were to be seen not alone his class of Undergraduates but Fellows and Professors and literary men, with a sprinkling in addition of ladies, at that time a novelty in a College lecture-room."

a book about comets. When he sought applications for his mathematics in order to visualize, he often chose subjects from astronomy, such as orbits of planets and comets, and his 1853 *Lectures on Quaternions* starts with one and a half pages of astronomy. [26]

And contrary to what may have been suggested in his time, Hamilton himself felt that he even had contributed very much to astronomy. In June 1856 Hamilton wrote to De Morgan: "A few years ago you recommended me to get *Grant's History of Physical Astronomy* . I have only recently acted on the suggestion, stimulated, perhaps, by receiving an account of the well-deserved honour paid to the author by the Council of the Astronomical Society. The book is very valuable, and very creditable to its composer. But your humble servant may be pardoned if he finds himself somewhat amused at the title, "History of Physical Astronomy, from the Earliest Ages to the middle of the Nineteenth Century," when he fails to observe any notice of the discoveries of Sir W.R. Hamilton in the theory of the Dynamics of the Heavens. Jacobi thought them of importance enough to deserve an elaborate commentary at his own hands, and of course I admit, though perhaps it is rather lately that I have really felt, how very richly he adorned the subject, by taking it up where I had left it."

In 1856 Hamilton wrote to Robinson, "Within the last few days I have received from Paris a quarto of about 200 pages, almost entirely devoted to the development and application of my results in physical astronomy – the first part relating to my abstract results in dynamics, and the second being headed, *Tèse d'astronomie. Application de la Méthode de M. Hamilton au Calcul des Perturbations de Jupiter* – by Saturn, Uranus, Neptune and Mars, the Earth, &c. – with long inequalities of all sorts extended to the years of our Lord, 2300, and 2800 – all by Prof. or Monsieur Houel, of Alençon but submitted to Cauchy, Duhamel, and Delaunay, and (as it seems) approved by them. How comfortable to see my abstract results translated into hundredths of seconds sexagesimal! and how odd a feeling it gives to read, in the astronomical department, every now and then, of "l'ellipse de M. Hamilton"! or better still, here and there, without the "M," "l'ellipse de Hamilton"! – for it is the truth, though perhaps scarcely two or three persons in these countries have noticed it, that I assigned, twenty years ago, elliptic orbits for all the planets, essentially distinct in theory, though very little differing in practice, from those so beautifully imagined by Lagrange, and having certain centrobasic and symmetric advantages."

Moreover, next to his mechanics also his quaternions attributed to astronomy, having been able to describe attractive forces, and therewith orbits of planets and comets, with "the notations of the Calculus of Quaternions," as can be seen in the Articles 420 and 421 in his *Elements of Quaternions*. [27]

Also in 1856 Hamilton suffered from his first attack of gout, and through the years it became worse. But it was not just gout; starting on the description of 1865, Hamilton's last year, Graves wrote that on the 2nd January, "Hamilton begins thus a letter to his younger son: – 'It is a solemn thing, but I do not find it a painful one, to enter on a new year. I wish you many happy returns. It was my hope to have gone to Castleknock [to church] yesterday, but my cough was by no means so far gone as to make that safe.' These words may serve to indicate [...] the shaken state of his bodily health, which from henceforth had to contend with a fatal combination of gout and bronchitis."

8 Mainly a mathematician, yet also Royal Astronomer

Although Hamilton certainly greatly preferred mathematics over astronomy, it is totally unknown what would have happened if he had not gotten ill so often when observing. There

[26] archive.org/details/lecturesonquater00hami/page/n143.
[27] archive.org/details/elementsofquater00hamiuoft/page/732.

is an account of Hamilton being actually very good as practical astronomer; in 1846 having visited Greenwich Observatory and Airy having being absent he wrote, "I also amused myself [..] and idled the younger Mr. Breen, by my taking a transit of Polaris over a side-wire in the day-time, without an eye-glass. I estimated the error of my observation at five seconds: Mr. Breen concluded it to have been less than three." And in 1853 Hamilton wrote about his assistant Thompson, "The vast majority of [the] forty and odd thousand observations [recorded at Dunsink Observatory] has been made by my assistant, Mr. Charles Thompson [...]. I must add that I have spent with him a great many nights of observing in the dome."

Therefore, realizing that he always remained enthusiastic about astronomical events; that practical astronomy then was mainly doing the same measurements again and again; how much Hamilton's health suffered from observing; and that it can easily be assumed that regularly becoming ill doing something will not enhance any one's attraction to it, I do not think I would again call Hamilton, as I did, a "reluctant practical astronomer." Or claim, as his Wikipedia page does, that he "paid little attention to the regular work of the practical astronomer."