MATHEMATICAL PERSPECTIVES

ABOUT THE COVER:
JAMES JOSEPH SYLVESTER'S *SPRING'S DÉBUT*

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Many able scholars have tried their hands at more than one discipline. For various plausible reasons, mathematicians often have a go at music. It seems that one field, however, usually plays the dominant role. Paul Valéry, for example, was seriously interested in mathematics and associated regularly with mathematicians, but no one doubted that he was, above all, a poet. James Joseph Sylvester (1814–1897) will be long remembered as a mathematician who worked in a variety of subdisciplines in the field. But he also seemed to take his poetry seriously, even if few others agreed. He had long written verse for his own satisfaction but by 1870 he was moving on to a more serious analysis of the art of writing verse and published a short treatise on the subject. The treatise, though short, had an unwieldy title: *The Laws of Verse: or, Principles of Versification Exemplified in Metrical Translations: Together with an Annotated Reprint of the Inaugural Presidential Address to the Mathematical and Physical Sections of the British Association at Exeter* (Longmans, Green & Co.) [3, p. 71]. The title page of his 213-line poem, *Spring's Début*, appears on the cover of this issue of the *Bulletin*.

After an early attempt in 1876 to write an unusual poem called *Rosalind*, in 1879 he sat down in Baltimore to finish his piece and, one month later, the other poem discussed here, *Spring's Début*. These two are poems of the type he called "monochromatic rhyme." *Rosalind* was indeed named for the character in *As You Like It*, and consists of roughly 400 lines all ending with the same sound, that of the last syllable of variant pronunciations of the name Rosalind. Sylvester may well have been prompted to look at monochromatic verse by Shakespeare's own lines, "From the east to western Ind, No jewel is like Rosalind."

Sylvester's life was one crowded with incident. He arrived in Baltimore after many frustrations and adventures in Europe and America. His career as student

and beginning faculty member had been complicated by his being Jewish and unwilling to sign the thirty-nine articles of the Church of England required for positions at Oxford or Cambridge. There is also evidence that he had a rather fiery personality. When Sylvester was a 14-year-old student at University College, London, his brother, citing Sylvester's "extreme youth," was forced to withdraw him from school for having threatened a fellow student with a knife in the College Refectory. This was perhaps a portent of things to come. At 27 Sylvester had to choose between offers at the University of Virginia and Trinity College, Dublin. He chose the former and this led to an incident reported in many versions, one even billed as "fictional" [2, pp. 1–14].

A more careful investigation of Charlottesville might have been wise. In August 1841, the editor of Richmond's Presbyterian journal, *Watchman of the South*, had written that "the University of Virginia should reflect its constituency, and that constituency was by definition not foreign and was 'by professions Christians and not heathen, nor musselmen, nor Jews, nor Atheists, nor Infidels. They are also Protestants, and not Papists.' " Just to wrap things up, the author went on to attack the University's godlessness, referring to Jefferson and his collaborators [3, pp. 68–69]. This was not an auspicious welcome, but Sylvester ended up not staying very long. One evening on campus he encountered a couple of abusive students, their judgment probably impaired by drink, and in the ensuing contretemps, Sylvester wounded one of them slightly with the sword in his walking stick (or metal-tipped cane—accounts differ) and the student was taken off to the hospital. Hearing a rumor that the student had died, Sylvester left for New York and later went back to England. There he pursued study of the law, thus encountering one of his most influential colleagues, Arthur Cayley. He also worked in England as an actuary, and taught at the Royal Military Academy in Woolwich. All of these activities proved to be strikingly successful, especially those in collaboration with Cayley. During this period Sylvester produced some of his best mathematics, work in the development of the theory of matrices and the invariant theory, enormously influential at the time but later supplanted in part by a more modern treatment by Hilbert.

In 1876 the United States was celebrating its centennial and one celebratory event was to be the founding of a major and modern research university in Baltimore, one that, though it would have an undergraduate division, was to emphasize research and graduate education. With the financial backing of Johns Hopkins, a local philanthropist, the president of the University of California, Berkeley, Daniel Coit Gilman, was recruited to be the first president of the new institution, the Johns Hopkins University. When the question of finding someone to fill the mathematics chair arose, Gilman sought the advice of two senior figures in American science, Benjamin Peirce, a mathematician at Harvard, and Joseph Henry, secretary of the Smithsonian Institution. Both recommended Sylvester, though Peirce had some concerns about his teaching. As Peirce put it: "[A]s the barn yard fowl cannot understand the flight of the eagle, so it is the eaglet only who will be nourished by his instruction" [4, p. 73]. Gilman chose Sylvester. Soon thereafter, based on Sylvester's reputation, the fledgling university started to attract good faculty and students. And, in what has probably been one of the most lasting effects of the prescient thinking of Gilman and Sylvester, Baltimore witnessed the founding of the *American Journal of Mathematics*, which changed the publication of mathematical

research in the United States. It was the first mathematical research journal in America and enjoyed international respect, which it retains to this day. While Johns Hopkins did not have the same impact that the University of Chicago was to have some twenty years later, there were similarities. Both institutions had chosen inspired presidents at their founding and had attracted outstanding faculty and students. Felix Klein played Sylvester's role in Chicago, though unlike Sylvester, he was not physically present. With people like Fabian Franklin and W. E. Story also working at Johns Hopkins, American mathematics could not be ignored [4, pp. 72–73].

It was in this exciting atmosphere that Sylvester's muse reappeared. Florian Cajori reported that in 1879 Sylvester arranged for a reading of his *Rosalind* at the Peabody Institute in Baltimore. Incidentally, it should be noted here that some scholars claim that Sylvester never wrote a paper that did not contain at least one footnote. So it is no surprise that his poems should also contain footnotes and plenty of them. Thus, wishing to make sure that his audience really understood his poem, "he first read all his explanatory footnotes so as not to interrupt the poem; these took an hour and a half. Then he read the poem itself to the remnant of his audience" [1, p. 343].

This sounds like a débacle. Parshall is somewhat more kind, pointing out that with Sylvester's high reputation in Baltimore, the audience was enthusiastic and the house was packed. Sylvester too must have noticed something of the absurdity of the scene, but he was undeterred; *Spring's Début* appeared only a month later. Audiences were probably more tolerant of marathon sessions of poetry then than now. The work has a not unexpected Victorian charm and technical facility. David Eugene Smith, the mathematical historian, wrote in the *Dictionary of American Biography* of Sylvester's *Laws of Verse*, which included some of Sylvester's translations of Horace and poems from the German, that the poet illustrated the principle of "phonetic syzygy"—"the apt juncture of syllables." It is interesting here to see the word "syzygy" which also appears in Sylvester's mathematics. Smith continues with a positive appraisal, up to his pointing out that Sylvester was fully capable in Greek, Latin, French, German, and Italian, as well as English. He does conclude, however, that "Most of Sylvester's original verse showed more ingenuity than poetic feeling."

One must conclude that Sylvester's monochromatic rhyme is a footnote in the history of poetry. I was recently speculating over lunch about which of the nine muses would most likely have been given the assignment of overseeing monochromatic verse—perhaps Polyhymnia, with her ever pensive pose. A colleague had a counterproposal, "The deaf one."

Perhaps you should decide for yourselves. In Figure 1 you can read the first nine lines of *Spring's Début/A Town Idyll/In two centuries of continuous rhyme*, which was inspired by overhearing a conversation between two women strolling on Charles Street. Sylvester was enjoying a morning walk with the son of the heir to the Baltimore and Ohio Railroad fortune.

The number of lines actually runs to 213, not the "two centuries" promised in the subtitle. And there are the ever-present footnotes, some rather amusing. Residents of Baltimore will be pleased to learn that "Charles Street is the Bond Street, the Eternal Street of elegance and fashion, of Baltimore." Every major nineteenth-century American city had its beloved painter of cows in meadows, and

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POET :

> Who is she so blithe of mien
> Airy nymph on Charles Street seen,[1]
> Sight ~~propitious~~ *elixir* to " sair 'een,"
> Light as elves that trip the green
> Thread deep dell or leafy dene,
> Led by Oberon's faerie Queen,
> Fresh as dew-drenched Jessamin,
> Or on Pennington's storied screen,[2]
> Or where Tait paints cattle in[3]

[1] Charles Street is the Bond Street, the Eternal Street of elegance and fashion, of Baltimore. In America the more picturesque form of expression " on the street " is used where in England we should say " in the street." *On* conveys the idea of an unenclosed space.

[2] Mr. Harper Pennington at the age of 18 painted on a screen for Miss Mary Garrett a Derby Day of Cupids mounted on Dragon-flies, which was exhibited at the late art loan exhibition in Baltimore where it attracted great and deserved admiration.

[3] Mr. J. R. Tait, also of Baltimore, is a painter of cattle pieces and landscapes and bids fair to take rank some day as the American Troyon. I own a small piece of his (Cattle and Sunset) where the receding tones of the suffused light in

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FIGURE 1

Sylvester reminds us that the J. R. Tait in the poem was Baltimore's own such. In a footnote Sylvester claims that he owns a small Tait himself, called "Cattle and Sunset." He predicts that Tait will become the American Troyon (Constant Troyon, a fashionable Barbizon painter of the day, whose "Oxen at Work" at the Louvre was once very popular).

The poem closes with "*De cas fins gestes voilà la fin!*"

What can we conclude from all of this about Sylvester? He was eccentric and, at least in his early years, probably short tempered. He had enormous enthusiasm and wide-ranging interests. With his erudition in language, he wrote prose that is dazzling in its scholarship and which can be exhausting to read. His poetry is more easily accessible. With others he was generous and showed appreciation of their efforts. At times he appears to be a caricature of the slightly addled professor. He once submitted a manuscript to the *Journal of the London Mathematical Society* with a note describing it as the best work he had done in the past 10 years, only to have it returned to him by the Society's Secretary with a note saying they had already published it. Altogether, though, he comes across as a fascinating character.

Sylvester left Baltimore in 1883 to take the Savilian Chair in Geometry at Oxford.

Sylvester published his poetry privately. The copy of *Spring's Début*, shown in part here, was acquired thirty years ago by the author from a San Francisco antiquarian bookseller. It is a presentation copy, annotated and corrected, and given by Sylvester to "Professor Child, with the author's best regards." Child was Francis James Child (1825–1896), a philologist, professor of rhetoric at Harvard, and successor to the better-known Edward Tyrrel Channing.

References

[1] Florian Cajori. *The History of Mathematics*, 2nd edition. New York, Macmillan, 1919.

[2] Guy Davenport. *A Table of Green Fields/Ten Stories*. New York, New Directions, 1993.

[3] Karen Hunger Parshall. *James Joseph Sylvester: Jewish Mathematician in a Victorian World*. Baltimore, The Johns Hopkins University Press, 2006. MR2216541 (2007a:01013)

[4] Karen Hunger Parshall and David E. Rowe. *The Emergence of the American Mathematical Research Community*, 1876–1900: *J. J. Sylvester, Felix Klein, and E. H. Moore*. Providence, RI, American Mathematical Society, 1994. MR1290994 (95j:01032)

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