The anti-math or “I hate math” narrative is all too common. From Teen Talk Barbie’s famous “math is hard” catchphrase to the regular editorials criticizing common core mathematics, the frustration narrative about mathematics is everywhere. But from where do these unpleasant yet popularized mathematical archetypes stem? They are often prevalent when the connections between the natural language and mathematics break down, when students are frustrated, and when their frustrations are fueled and normalized in the media [12, p. 2].

The practice of expressing one’s frustrations about mathematics and its practitioners became popularized with the growth of printed media in the nineteenth century. While Lewis Carroll’s Alice books and Edwin Abbott’s Flatland have been critically received as literary texts that address mathematical polemics [1, 8], the culture of mathematics in quotidian Victorian realms has received little attention. Ambivalence, aversion, and popular resentments that stemmed particularly from elements of Victorian British mathematics education are clearly reflected in the literature of the day. The humor of Tom Tulliver’s mathematical frustrations with Euclidean geometry are depicted in George Eliot’s The Mill on the Floss, while Bram Stoker’s “The Judge’s House” gives a vivid account of the stresses involved in cramming for the Cambridge Tripos examination. Sir Arthur Conan Doyle’s “The Adventure of the Final Problem” views things from a different perspective, the professional mathematician as effigy. Taken together, these representatives of the humor, horror, and detective genres highlight just how widespread the various sources of antipathetic culture about mathematics and mathematical education were in Victorian Britain.

George Eliot’s Tom Tulliver

Perhaps the most relatable narrative of mathematical aversion stems from the perplexed student. Among the most humorous fictional nineteenth-century accounts is that of Tom Tulliver’s frustrations with Euclidean geometry in George Eliot’s The Mill on the Floss. While the novel centers on the Tulliver family’s mill, a lawsuit, their eventual loss of the mill, and their downfall, Victorian education was also undeniably at the forefront of Eliot’s novelistic pursuit.

Eliot’s formal education had been limited following her sixteenth birthday. Still, at the age of thirty-two, she attended Francis Newman’s lectures on Euclid at the Ladies College (later Bedford College) in London. As a result, she had first-hand knowledge of and frustration with geometry pedagogy. She found herself so defeated by it that she wanted to “giv[e] it up” [9, p. 79].

Nine years later, Eliot’s frustrations transform into Tom’s in The Mill on the Floss. Tom wishes his father would ask
Mr. Stelling, his instructor, “to not let [him] do Euclid,” since “it brings on the toothache, [he] thinks” [5, p. 113]. Eliot interjects her frustrations parenthetically into Tom’s when her narrator comments that “[t]he toothache was the only malady to which Tom had ever been subject[ed]” [5, p. 113]. The inclusion of this gloss is important for a couple of reasons. On the one hand, it humorously suggests Tom’s clumsiness in trying to express his anguish: comparison with the toothache is the only thing he can think of. On the other, however, it sets up a sort of equivalence relation between the physical pain of a toothache and the overwhelming frustration one feels when learning Euclidean geometry in the context of the Victorian classroom. Eliot thus portrays Tom as overcome both physically and symptomatically by Euclidean geometry as a result of his negative affective experience with it.

Such experiences were quite common. In the nineteenth century, mathematics educators criticized the teaching of geometry based on Euclid’s Elements for its unintuitive-ness and lack of emphasis on mathematical creativity and discovery. For example, James Joseph Sylvester, one of Victorian Britain’s leading mathematicians, declared that his study of Euclid had “made [him] a hater of geometry” [13, p. 326]. Sylvester was in good company. From its founding in 1871, the Association for the Improvement of Geometrical Teaching (AIGT) challenged Euclid’s Elements as the primary instructional text for geometry. Three of its critiques of the text and its instructional use were that the demonstrations of geometrical knowledge were artificial, that the syllogistic form of reasoning adopted were too “stiff” and obscure for beginners, and that too much emphasis was placed on memorization [13, p. 327].

Although the AIGT failed in its efforts to replace the Elements in the classroom, pedagogues continued to criticize it. To take just one example, Mary Boole, wife of the famous logician George Boole, likened it to Charles Darwin’s On the Origin of Species (1859) because both were written for experts well versed in the subject as opposed to beginners [2, p. 904]. While some readers may have seen the description of Tom’s encounter with Euclid as an exaggeration, many, no doubt, were all too familiar with feelings of hopelessness related to trying to make heads or tails out of the Elements. But in any case, they laughed, and thereby let off steam. Eliot’s account of Tom’s difficulties thus normalized the widespread resentment many felt as they struggled through the Elements in their efforts to master Euclidean geometry.

**Bram Stoker’s Take on the Cambridge Tripos**

Popular periodical literature also contributed to Victorian mathematical antipathy by highlighting the cramming process associated, for example, with the Cambridge Tripos, the notorious final examination required of all Cambridge students desirous of honors. Bram Stoker’s “The Judge’s House,” published in the Christmas issue of the Illustrated Sporting and Dramatic News in 1891, introduced readers to Malcolm Malcolmson, a hubristic and hyperfocused Cambridge mathematics student who ignores the backdrop of his study space, the allegedly haunted house of a deceased judge, in his single-minded pursuit of a high Tripos score.

Stoker had earned a B.A. in mathematics in 1870 from Trinity College, Dublin, so his perception of the mathematician came from his first-hand knowledge of competitive examinations, even if not of the Tripos itself. Among many other topics, the Tripos covered the first four books of Euclid’s Elements as well as sections from Isaac Newton’s Principia Mathematica, but it emphasized memorization and speed of manipulation instead of creative thinking [3, p. 1]. Cantabrigian and later Cambridge mathematical don Andrew Forsyth famously criticized the examination as one that made students “mechanics rather than engineers” as they “were drilled in the gymnastic that led to swift answer according to rule and pattern” with no room to think [6, p. 177]. The top-performing undergraduate was awarded the title of Senior Wrangler, a prestigious distinction that opened doors in Cambridge and beyond. As a result, serious Tripos examinees spent three to four years drilling mathematics in order to succeed.

Juxtaposed with Malcolm Malcolmson’s preparations for this difficult examination are the supernatural elements within the confines of his study space. After meeting and speaking to Mr. Carnford, the rental agent, Malcolm decides to stay in an allegedly haunted Jacobean-style house. Mrs. Dempster, an innkeeper, tries to warn him of bogies, that is, evil and mischievous spirits, in the form, among other things, of rats, mice, beetles, creaky doors, and loose slates [15, p. 4]. He sarcastically responds that “[y]ou know more than a Senior Wrangler” [15, p. 5]. Another innkeeper, Mrs. Witham, warns him that the house is haunted by all those “who [were] held in great terror on account of” the deceased judge’s “harsh sentences and hostility to prisoners at Assizes,” and she avows that she would not stay there for all the money in Drinkwater’s Bank [15, p. 3]. Malcolm arrogantly retorts that he has “too much to think of to be disturbed by any of these mysterious ’somethings’” [15, p. 3]. He considers his work too exact and prosaic to allow any corner in his mind for mysteries of any kind [15, p. 3]. Instead, he conceitedly declares that his mysteries come as “Harmonical Progression[s], Permutations and Combina-tions, and Elliptic Functions” [15, pp. 3-4].

Stoker’s portrayal of Malcolm is thus unsympathetic in at least two ways. Malcolm is arrogant, and he is wealthy. He openly ignores the innkeepers and their warnings about the history, lore, and culture of the home, and his relatively privileged background allows him to let a quiet study space, a luxury not afforded those of his counterparts attending Cambridge on scholarship. Both Mr. Carnford and Malcolm believe that if a mathematical scholar can stay in the allegedly haunted house without incident, then the rumors about it would be put to rest once and for all. Malcolm embraces this identity because he believes himself to have a sound, reasoning mind that surpasses those of the superstitious innkeepers. Malcolm’s refusal to take heed renders not only him, but more generally, the mathematician, unlikeable to readers, since the only lens through which readers see Malcolm as the story’s antithro is as a mathematician.

Believing that he is impervious to the supernatural because he is a mathematician and because his mind is
hyperfocused on the Tripos, Malcolm settles into his studies. He becomes “so immersed in his work that everything in the world, except the problem which he was trying to solve, passed away from him” [15, p.7]. As a result, breaking Malcolm’s concentration is nearly impossible. Yet, when a rat descends the judge’s alarm bell rope, Malcolm, forced to turn from his work, jabs at it with a poker. The next morning, Mrs. Witham notices that Malcolm is pale. She attributes it to “too late hours and too hard work on the brain” [15, p.8], and Malcolm agrees but nevertheless continues with his studies. When the rat returns, Malcolm believes that mathematics and logic will save him quite literally when he throws his book of logarithms at it. This moment signifies Malcolm’s internal battle with reason and the supernatural. Having initially and arrogantly dismissed the warnings about the supernatural aspects of the house, he throws the only logic and reason he knows at the bogie rat in the hopes that it will disappear. When that fails, Malcolm suddenly desires the company of friends again and seems more open to the innkeeper’s warnings.

Later, while testing the strength of the alarm bell’s rope, Malcolm learns that it is actually the rope the hangman used on the judge’s victims. The next night, when the rat comes again, it is clear that Malcolm has given up all hope of finding a rational explanation for it, since “his knees shook, and heavy drops of sweat came on his forehead, and he trembled like an aspen” [15, p.16]. At the same time, he realizes that the judge’s picture is on the wall, and the rat, “with the Judge’s baleful eyes,” is in the chair behind him [15, p.16]. Malcolm tries to shake off his “nervous apprehension” [15, p.17] with some brandy and more studying. Disturbed once again by the rat, however, he decides to quit for the night only to notice “a great irregular patch of brown canvas” in the portrait where the image of the judge had been [15, p.18]. Malcolm then discovers, seated behind him, “the Judge in his robes of scarlet and ermine, with his baleful eyes glaring vindictively” [15, p.18]. The judge next ties the rope into a noose and hangs Malcolm, while “on the face of the Judge,” now back in the portrait, “was a malignant smile” [15, p.20].

Malcolm’s death humanizes him, thereby highlighting Victorian antipathies and popular resentments of mathematical study. Malcolm’s refusal to acknowledge the history and culture of the judge’s house while cramming for the Tripos casts him in the unflattering light of a young, cocky, self-important mathematician. Although he pits his mathematical and logical mind against the judge’s supernatural forces, he is vanquished by the judge’s superior spirit. This conclusion serves as a reminder that no matter how hubristic, the mathematician is still fallible. Pushing reason into the realm of unreason contributes, in Malcolm’s case, to his downfall.

Sir Arthur Conan Doyle’s Professor Moriarty

Not only was there widespread resentment in Victorian Britain toward various forms of mathematics education, there was also a certain lack of sympathy for the professional mathematician. The nineteenth century, a critical period in Britain for professionalization in many areas, witnessed mathematics evolve from its role of servant to the sciences to a recognized profession with all of the financial and other trappings thereof [7, p.4]. Print media responded to this trend by fictionalizing mathematical professionals as villains. Among the most famous mathematician villains is Sir Arthur Conan Doyle’s Professor Moriarty.

In 1868, Conan Doyle attended the Stonyhurst boarding school, from which he drew inspiration for many of the characters in the Sherlock Holmes canon. In particular, Professor Moriarty was modeled on two of Conan Doyle’s classmates, James and Michael Moriarty. James was brilliant in mathematical studies, and Michael was devious and untrustworthy [11, p.36]; Conan Doyle’s professor combines the traits of both.

In 1893, when he wanted to end the Sherlock Holmes series to make time for his other interests in history and spiritualism, Conan Doyle boldly demanded £1000 from his publishers for his next twelve stories, an absurdly high price [10, p.114]. Much to his surprise, the Strand Magazine eagerly accepted the offer. Since his outrageous asking price failed to end the series, Conan Doyle introduced Moriarty to slay Holmes in “The Adventure of the Final Problem.”

To villainize Moriarty’s passive mathematical mind, Conan Doyle juxtaposed it with Holmes’s logical mind. Holmes—known for his active, hands-on, and most careful deductions—is capable of unraveling an unsolved case on the basis of the tiniest clue. His deductive skills are highly desirable, since much of Conan Doyle’s readership puzzled alongside Holmes and was mystified as he solved even the most complex cases. Moriarty, on the other hand, is less dynamic and less involved in his criminal activities. Holmes described him as one who has a brain that is “of the first order. He sits motionless, like a spider in the centre of its web, but that web has a thousand radiations, and he knows well every quiver of each of them.” [4, p.2]. Moriarty is also credited with having written “a treatise upon the Binomial Theorem, which has had a European vogue. On the strength of it he won the Mathematical Chair at one of our smaller universities, and had, to all appearance, a most brilliant career before him” [4, p.2]. Conan Doyle suggested that Moriarty’s mathematical abilities heightened his predisposition for criminal tendencies present in his bloodline [4, p.2].

Although Holmes and Moriarty approach problem-solving differently, Conan Doyle construed them as intellectual equivalents. “The Adventure of the Final Problem” creates this illusion by showcasing the intellectual back-and-forth between the two men, but it ends inconclusively when Holmes and Moriarty presumably both fall to their deaths at Reichenbach Falls. The intellectual back-and-forth between Holmes and Moriarty is critical not only because Conan Doyle needed to convince readers of the plausibility of Moriarty’s destruction of Holmes but also to heighten the narrative tension and frustration with the mathematician who carried it out.

With such uncertainty regarding the circumstances of Holmes’s death, readers, not surprisingly upset by it, quickly canceled their subscriptions to the Strand Magazine and sent threatening letters to Conan Doyle [14, p.114]. They also grieved Holmes’s death by writing his
Blowing off Steam

Tom Tulliver’s experiences with Euclidean geometry showcase the quotidian frustrations of the average student; Malcolm Malcolmson succumbs to his mathematical hubris while cramming for the Tripos; Professor Moriarty transforms the professional mathematician into an effigy for widespread mathematical resentment. These narratives all acknowledge that mathematical discovery can be frustrating and can depersonalize vexations stemming from it. Tom’s complaints about Euclidean geometry are brief, but they pinpoint the source of angst associated with learning mathematics. When Malcolm’s arrogance results in his downfall, readers ultimately come to see him as human. Finally, watching Conan Doyle’s Moriarty fight Holmes provides closure for readers, since the mathematician, who does not seem to struggle, still fails to come out on top.

These moments can be seen as critiques of pedagogical practices and perceptions dominant in Victorian Britain and serve to normalize readers’ frustrations about their mathematical experiences—to “blow off steam”—and thereby set a precedent for the contemporary reader to do so as well.

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