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American Scientists and their Fictions:

Professional Authorship and Intellectual Identity, 1870-1900

Abstract:

Writers and critics in the Gilded Age United States frequently debated the relations between literature and science. A common contemporary interpretation of this relationship held that these two ways of knowing and writing were fundamentally opposed and that the advancement of science in American culture came at the expense of literary sensibilities. Nevertheless, and often as an effort to challenge this supposed opposition, many scientists also cultivated reputations as literary figures, and produced or planned diverse works ranging from travel-writing and novels to verse drama. Such authors as Clarence King, J. Peter Lesley, Simon Newcomb and Nathaniel Southgate Shaler sustained a hybrid literary-scientific culture in the late nineteenth-century. This interdisciplinary cultural zone was fragile and increasingly fractured by around 1900, as the emergence and consolidation of new categories of intellectual labour became increasingly wedded to the images of the “professional author” and the “scientist” as mutually exclusive identities. This article seeks to contribute to recurrent debates about the “two cultures” of literature and science by foregrounding the differentiation of these new forms of professional and intellectual identity as a decisive factor which constrained the possibility of a shared literary-scientific culture by the turn of the twentieth century.

In an 1898 article for the *Atlantic Monthly*, the American geologist and anthropologist W. J. McGee offered an account of “Thirst in the Desert,” which combined his personal experiences of severe dehydration in the arid southwest with technical physiological detail.¹ The narrative was by turns evenly informative and gruesomely graphic. In the early phases of thirst, McGee related, “the gums shrink and tear away from the teeth, starting zones of blood to thicken in irregular crusts,” and “the nape and half the spine are like a swollen tumor when pressed hard, with the surgeon’s lancet pushing through it.” The final stage was one of “living death,” in which, for the tormented sufferer, “the shadow of shrub or rock is a Tantalus’ pool,” but where there was “no alleviation, no relief, until the too persistent heart or lungs show mercy, or kindly coyotes close in to the final feast.”²

McGee was by this time a highly regarded scientist who had worked for both the United States Geological Survey and the Bureau of Ethnology, and had published in specialist scientific journals, the papers of learned societies, and government-sponsored scientific reports. Yet his intellectual identity as a scientist was no guarantee of recognition among the readers of that storied “house-journal of the northeastern bourgeoisie,” the *Atlantic*, or its wider literary milieu.³ A critical notice of “Thirst in the Desert” appeared in the *New York Tribune*, and confessed that “Mr. McGee... is unknown to us,” while also pondering his authorial status. “Perhaps he is a professional author, but we doubt it,” the *Tribune*’s critic wrote. “If he is, he has concealed the

¹ W. J. McGee, “Thirst in the Desert,” *Atlantic Monthly* 81 (April 1898): 483-88.

² *Ibid.*, 483, 485.

³ Andrew Lawson, *Downwardly Mobile: The Changing Fortunes of American Realism* (Oxford and New York: Oxford University Press, 2012), 44; Nancy Glazener notes that the genteel literary periodicals typified by the *Atlantic* in the late nineteenth century “had greater authority over American literature than any other institution did.” Glazener, *Reading for Realism: The History of a U.S. Literary Institution, 1850-1910* (Durham: Duke University Press, 1997), 5.

usually unmistakable earmarks of authorship,” and the article was, “much more likely to have been produced by a man whose business does not lie among books and pens.” Such judgments were intended as praise. By dispensing with the self-conscious “touch of the artist,” McGee’s piece was seen to foreground “the psychology of tormenting thirst” to greater effect than a more self-consciously “professional” literary work.⁴

McGee’s sketch and the *Tribune*’s response to it offer one small example of the sense held by many educated Americans in the late nineteenth century that a deepening divide separated science and literature as ways of knowing and describing the world. The problem of locating an author such as McGee was linked to deeper questions and cultural anxieties about knowledge and expertise, literature and culture, and professionalism and intellectual identity, which were by no means resolved at the turn of the century, even if the distinction between the “professional author” and the “scientist” marked a newly entrenched stabilization of fluid categories.

Such debates have remained pressing public issues: the British scientific administrator and novelist C. P. Snow famously returned to this theme in lamenting the estrangement of “literary intellectuals” and “scientists” in a 1959 lecture on “The Two Cultures.”⁵ The discussion Snow provoked continues to resonate in scholarship on science and literature (especially in the field of Victorian studies), in ecocriticism, and in more reflexive concerns about the differentiation of STEM and Humanities subjects.⁶

⁴ Clipping from *New York Tribune Illustrated Supplement* (April 17, 1898), 16; encl. in Willard D. Johnson to W J McGee, April 19, 1898, in William John McGee Papers, Manuscripts Division, Library of Congress, Washington DC, Box 7, Folder “J-L, 1893-1903.”

⁵ C. P. Snow, *The Two Cultures*, rev. ed., with Introduction by Stefan Collini (Cambridge: Cambridge University Press, 1998), 4.

⁶ Charlotte Sleight, *Literature and Science* (Basingstoke: Palgrave Macmillan, 2011); Alice Jenkins, “Beyond Two Cultures: Science, Literature, and Disciplinary Boundaries,” in *The Oxford Handbook of Victorian Literary Culture*, ed. Juliet John (Oxford: Oxford University Press, 2016), 401-15; Laura Dassow Walls, “From the Modern to the Ecological: Latour on Walden Pond,” in *Ecocritical Theory: New European Approaches*, ed. Axel Goodbody and Katy Rigby (Charlottesville: University of Virginia Press, 2011): 98-110; for examples of recent reporting and commentary on the STEM/Humanities divide in US

Reconsiderations of the “two cultures” binary have frequently turned to the prospect of interdisciplinarity, and in particular the conjoined study of science and literature, as a means of bridging or transcending the supposed divide, and recovering the common ground of “one culture.”⁷ Such scholarship has already softened the distinction between the “two cultures,” and so of the texts which were written and read across the boundaries of science and literature. This article seeks to shed light on these recurrent debates by foregrounding the differentiation of literary and scientific forms of professionalism and intellectual identity during the late-nineteenth century as a decisive factor in deepening a sense of estrangement between literature and science. By around 1900 many overlapping social structures of American intellectual life (from literary periodicals and publishing, to universities, to government bureaus of research) had come to instantiate and enforce strict distinctions between scientific and literary work.⁸ We can further our understanding of this intellectual transformation by recovering the interrelated literary-scientific discourses of the Gilded Age within which scientists themselves struggled,

higher education, see Charlie Tyson, “Humanities vs. STEM, Redux,” *Inside Higher Ed*, August 18, 2014, accessed 26 July 2017, <https://www.insidehighered.com/news/2014/08/18/new-study-assesses-humanities-impact-credits-earned-not-majors-declared>; Mary Churchill, “The Science vs. Humanities Divide is False and Ideologically Driven,” *The Chronicle of Higher Education*, April 15, 2011, accessed 26 July, 2017, <http://www.chronicle.com/blogs/old-new/the-science-vs-humanities-divide-is-false-and-ideologically-driven/343>.

⁷ For a series of re-examinations of Snow’s arguments about the “two cultures,” and the wider relations of science and literature, see the varied contributions in Elinor S. Shaffer, ed., *The Third Culture: Literature and Science* (Berlin: De Gruyter, 1998) and Jay A. Labinger and Harry Collins, eds., *The One Culture?: A Conversation About Science* (Chicago: University of Chicago Press, 2001); Wai-chee Dimock and Priscilla Wald, eds., “Literature and Science: Cultural Forms, Conceptual Exchanges,” special issue, *American Literature* 74 (December 2002); on the “one culture” model and its critics, see Jenkins, “Beyond Two Cultures,” 408-10; David A. Hollinger situates Snow’s ideas in the American context in “Science as a Weapon in *Kulturkämpfe* in the United States during and after World War II,” *Science, Jews, and Secular Culture: Studies in Mid-Twentieth-Century American Intellectual History* (Princeton: Princeton University Press, 1996), 165-66.

⁸ There were prominent interdisciplinary hybrids, such as William James, who operated “at the boundaries” of these structures; yet James was known (and published) primarily as a scientist and philosopher rather than (as in the case of his brother Henry) as a professional author. Francesca Bordogna, *William James at the Boundaries: Philosophy, Science, and the Geography of Knowledge* (Chicago: University of Chicago Press, 2008).

ultimately unsuccessfully, to sustain “one culture” in which science and literature functioned as mutually enriching, and even potentially interchangeable, ways of knowing and forms of writing.

This hybrid culture will here be considered through the little-studied contributions which American scientists themselves made to literary culture.⁹ Clarence King (1842-1901), J. Peter Lesley (1819-1903), Simon Newcomb (1835-1909), and Nathaniel Southgate Shaler (1841-1906) all combined highly esteemed scientific work with literary preoccupations ranging from semi-fictionalized sketches of travel and exploration to novels, short stories, poetry, and verse drama. These scientist-authors were simultaneously constrained by and sought to resist the separation of scientific and literary modes of intellectual work, and in so doing sustained a significant if fragile hybrid literary-scientific culture. As the nineteenth century drew to a close this zone of cultural exchange was fractured amid the institutional pressures of specialization and the economic imperatives of the marketplace, which recast literary and scientific life according to new professional norms. The scientists discussed here sought in various ways to mitigate these tendencies, but ultimately found their modes of intellectual labour antithetical to the emerging literary culture of professional authorship.

Literature, Science, and the Professionalization of Intellect

⁹ There are abundant illuminating studies of the influence of science on literary culture, but they focus predominantly on established literary figures’ engagement with science, rather than established scientists’ engagements with literature. See for example Ronald E. Martin, *American Literature and the Universe of Force* (Durham: Duke University Press, 1981); Sherwood Cummings, *Mark Twain and Science: Adventures of a Mind* (Baton Rouge: Louisiana State University Press, 1988); the essays in Robert J. Scholnick, ed. *American Literature and Science* (Lexington: University Press of Kentucky, 1992); David E. Shi, *Facing Facts: Realism in American Thought and Culture, 1850-1920* (New York: Oxford University Press, 1995); Eric Wilson, *Romantic Turbulence: Chaos, Ecology, and American Space* (Basingstoke: Palgrave Macmillan, 2000); Nina Baym, *American Women of Letters and the Nineteenth-Century Sciences: Styles of Affiliation* (New Brunswick: Rutgers University Press, 2002); Laura Dassow Walls, *Emerson’s Life in Science: The Culture of Truth* (Ithaca: Cornell University Press, 2003).

Literary Americans in the latter half of the nineteenth century were keenly attuned to the transformative influence of scientific knowledge on their times. Charles Leland, who in the early 1860s had taken over as editor of the fading *Knickerbocker* magazine in New York, observed in a critical survey of contemporary literature, that,

dilettanti keep wondering what the Art of the future is to be, when this stupendous power of Science is advancing at colossal strides, inevitably destined in a few years to swallow up... every trace of old romance and art, poetry and romantic or sentimental feeling; yes, to conquer even literature, and then reproduce society completely changed, modified and made beautiful, in a spirit which will be neither classic nor Gothic, but differing from both, and infinitely more glorious than either – the spirit of the most literal of facts – of pure Nature.¹⁰

For those who made literature their livelihood, the rise of science was directly linked to the ceding of cultural authority by “men of letters”: new credentials and skills were now in favour, and Leland observed that, “the day has manifestly gone by when the mere *belles-lettres* scholar was accepted as authority in judging for a people.”¹¹

Such anxieties over literary aesthetics and cultural authority were transmitted through a simultaneously transatlantic and transdisciplinary discourse concerning the impact of science, within which Americans were particularly engaged with British interlocutors, including critics such as John Ruskin and Matthew Arnold, as well as naturalists like Charles Darwin. The crossing of fields and continents had enormous

¹⁰ Charles Godfrey Leland, *Sunshine in Thought* (1862; New York: Putnam, 1863), 146-47; Shi, *Facing Facts*, 66-70.

¹¹ Leland, *Sunshine in Thought*, 142.

appeal for American scientific figures such as Clarence King, who divided his time between fieldwork in the American West, the academic and government hubs of the east coast, and extended trips to Europe; overall, King was arguably *more* comfortable in London's literary circles than when engaged in federal science in Washington DC. At the same time, the impact of texts such as Darwin's *On the Origin of Species* (1859) was felt in the United States not simply in scientific circles, but in the wider literary-scientific milieu, within which the English evolutionary theorist's example was much-admired, even as it pointed to lines of fracture within the culture.¹² Indeed, Darwin himself fueled concerns over the potentially damaging impact of scientific habits of thought on established literary sensibilities, when he reflected on his "curious and lamentable loss of the higher aesthetic tastes," which appeared to be the consequence of an immersion in the methods and habits of scientific work.¹³

Darwin's own suggestion of a literary-scientific divide was merely one prominent instance of a persistent concern. The influential English critic Matthew Arnold sounded the alarm in more general terms in his Rede Lecture at Cambridge University in 1882, which itself laid the ground for the "two cultures" debate re-ignited in the mid-twentieth century. Arnold prophesied that an increased fixation on science risked the

¹² On Darwin's scientific and religious impact see Ronald L. Numbers, *Darwinism Comes to America* (Cambridge: Harvard University Press, 1998); on Darwin's influence on literary and intellectual life, particularly in New England, see Randall Fuller, *The Book That Changed America: How Darwin's Theory of Evolution Ignited a Nation* (New York: Viking, 2017); on the impact of Darwin's work on scientists' cultural authority, especially in Britain, see Gowan Dawson and Bernard Lightman, eds., *Victorian Scientific Naturalism: Community, Identity, Continuity* (Chicago: University of Chicago Press, 2014).

¹³ Darwin confessed in an autobiographical sketch, not written for publication, that, "I cannot endure to read a line of poetry," and that his once-beloved Shakespeare had become "so intolerably dull that it nauseated me," although he still found many novels "a wonderful relief and pleasure." Charles Darwin, *The Life and Letters of Charles Darwin, Including an Autobiographical Chapter*, ed. Francis Darwin, Vol. 1 (London: John Murray, 1887), 100-101; for an early-twentieth century challenge to the idea that scientific work corrupted Darwin's aesthetic sensibilities, authored by a British-born American scientist, see Edward Bradford Titchener, "Poetry and Science: The Case of Charles Darwin," *Popular Science Monthly* 74 (January 1909): 43-47.

impoverishment of a future culture, in which the “student of the natural sciences... will... know nothing of humane letters.”¹⁴ Arnold’s call was more reconciliatory than combative: he sought an accommodation with the natural and physical sciences, rather than their rejection, and American scientists were in fact sympathetic to such a project.¹⁵ Nevertheless, the gatekeepers of American literary culture remained wary about the prospect of a displacement of artistic by scientific ideals. Thomas Wentworth Higginson acknowledged in 1892, as though in response to Arnold’s cautionary warning: “Yes, it is the age of science; beneficent or baleful, saving or slaying, its sway has come.”¹⁶ In response, Higginson made a plea for a “world outside of science,” an artistic world of literature, poetry, music, and also a world of religion and ethics.

Such treatments of the relationship between science and literature were characteristic of the period in both their manifest and latent preoccupations: first, they explicitly posited a necessary opposition between science and literature as mutually exclusive forms of knowledge. Second, though more implicitly, they conveyed an undercurrent of anxiety about the status of intellectual labour in the late nineteenth century. This anxiety expressed itself in part through a persistently gendered construction of both literary and scientific work. The likes of Leland, Arnold and Higginson rooted their cultural authority in the identity of the “man of letters.” Analogously, their male scientific peers typically described themselves as “men of science” rather than “scientists” until the turn of the twentieth century. This was a means of simultaneously excluding women from the prestige and rewards of intellectual labour and resisting or

¹⁴ Matthew Arnold, “Literature and Science,” *The Nineteenth Century* 12 (August 1882), 228.

¹⁵ The zoologist Theodore Gill noted of Arnold’s lecture, “There is much in these utterances of Mr. Arnold which can be re-echoed by the man of science.” Theodore Gill, “Culture and Science,” *The American Naturalist* 22 (June, 1888), 487; see also Leslie Butler, *Critical Americans: Victorian Intellectuals and Transatlantic Liberal Reform* (Chapel Hill: University of North Carolina Press, 2007), 165-71.

¹⁶ Thomas Wentworth Higginson, “A World Outside of Science,” (1892) in idem., *Book and Heart: Essays on Literature and Life* (New York: Harper & Bros., 1897), 30.

tempering the professionalization of intellectual life which the increasing cultural centrality of science seemed to auger.¹⁷ In this climate the terms in which the identity of intellectuals was expressed were fluid, and often telling. In opposition to the emergent vocational category of the professional author, Leland personified the artistic sensibility in the figure of the “dilettanti,” while Higginson identified vaguely as “a literary man,” who, with respect to the more technical knowledge of “specialists” in the sciences, remained “a layman only.”¹⁸ What troubled these editors and writers was not simply a conflict between science and literature as competing vocations, but also the nascent reorganization of society around the values of “professionalism.” Concerns over the dehumanizing influence of science can be seen as, at root, expressions of anxiety about the professionalization of intellectual life and the shifting standards of cultural authority which accompanied it.¹⁹

The rhetorical invocation of a fundamental divide between science and literature should not be taken at face value. As Robert J. Scholnick has observed, science and literature in nineteenth-century America are best viewed not as “unrelated,” or “antagonistic,” but as “related modes of discourse within the context of a single

¹⁷ On women’s contributions to science and their exclusion from public prominence and professional identities, see Margaret W. Rossiter, *Women Scientists in America: Struggles and Strategies to 1940* (Baltimore: Johns Hopkins University Press, 1982); Baym, *American Women of Letters* and Elizabeth Keeney, *The Botanizers: Amateur Scientists in Nineteenth-Century America* (Chapel Hill: University of North Carolina Press, 1992); on the persistence of the “man of science” as a self-designation, see Paul Lucier, “The Professional and the Scientist in Nineteenth-Century America,” *Isis* 100 (2009): 699-732.

¹⁸ Higginson, “World Outside,” 37.

¹⁹ The paradigm of “professionalization” has long been invoked to explain the broader transformation of American society and culture over the course of the nineteenth century, and particularly in the decades following the Civil War: Burton J. Bledstein, *The Culture of Professionalism: The Middle Class and the Development of Higher Education in America* (New York: Norton, 1976); Gerald L. Geison, *Professions and Professional Ideologies in America* (Chapel Hill: University of North Carolina Press, 1983); Samuel Haber, *The Quest for Authority and Honor in the American Professions, 1750-1900* (Chicago: University of Chicago Press, 1991).

culture.”²⁰ Nevertheless, historical and critical interpretations of science and literature in the nineteenth-century United States tend to stress their estrangement, and attribute it to the spectre of professionalization. “Up through the beginning of the nineteenth century,” Scholnick asserts, “literature and science were understood as parts of a unitary endeavor, but by mid-century they had diverged. Science became the province of the professional, while concurrently poets, novelists, and other imaginative writers asserted the autonomy of their art.”²¹ Such interpretations emphasize the division of the literary-scientific culture of the late nineteenth century; but they also neglect persistent attempts made by scientists and literary authors and critics to bridge this supposed divide. The development of science is often presented as fundamentally entwined with larger patterns of professionalization.²² Yet as Paul Lucier has demonstrated, many “men of science,” were in fact increasingly concerned about the purported values of professionalism, which they associated narrowly with the exchange of goods in the economic marketplace. Scientists worried that embracing the vocational role of the professional “would corrupt American science” by subordinating it to “commercial or money-making enterprises,” and so constructed their intellectual identities as gentlemanly, disinterested, and culturally authoritative; that is, by appealing to the same forms of identification favoured by those literary figures concerned about the influence of science on the culture.²³

²⁰ Robert J. Scholnick, “Permeable Boundaries: Literature and Science in America,” in Scholnick, ed., *American Literature and Science*, 1, 3.

²¹ *Ibid.*, 1; on the emergence of the “scientist” as a category of social identification by the 1840s see also Shi, *Facing Facts*, 66; this can be contrasted with the more persuasive argument made in Lucier, “The Professional and the Scientist.”

²² For a classic account see George H. Daniels, “The Process of Professionalization in American Science: The Emergent Period, 1820-1860,” *Isis* 58 (Summer 1967): 150-66.

²³ Lucier, “The Professional and the Scientist,” 705; interpretations of the connections between literary and scientific professionalism are rare, but for one influential example see Aileen Fyfe, “Conscientious Workmen or Booksellers’ Hacks? The Professional Identities of Science Writers in the Mid-Nineteenth Century,” *Isis* 96 (June 2005): 192-223.

Literary figures and scientists, then, might be seen less as antagonists locked in cultural conflict and more as thinkers and writers who shared an underlying concern with the fate of intellectual labour at a time of social transformation. This has significant implications for our understanding of the relationship between science and literature in the period. It encourages us to rethink the assumed opposition or tension between these two modes of writing and ways of knowing; and it highlights the fact that professionalization was not a singular or homogenous process which impacted all areas of intellectual life in the same way. Rather, the ideal of professionalism was itself a construction of the later nineteenth century, deployed – often inconsistently – across the boundaries of science and literature.²⁴

The idea of literary professionalism has itself also been subjected to sustained historical and critical scrutiny.²⁵ The emergence of literary authorship as a profession was appraised by William Dean Howells in his 1893 essay on “The Man of Letters as a Man of Business.”²⁶ In Howells’s cautious evaluation of the dictates of the literary marketplace the underlying class anxieties of a would-be literary elite became explicit.

²⁴ As Alice Jenkins has observed of the recent historiography of science, “changes in the dominant narrative... mean that scientific professionalization is not now usually considered to have been so broad or intentional as was previously thought.” Jenkins, “Beyond Two Cultures,” 408.

²⁵ See the classic interpretation of William Charvat, *The Profession of Authorship in America, 1800-1870: The Papers of William Charvat*, ed. Matthew J. Bruccoli (Columbus: Ohio State University Press, 1968), which has been compellingly revised by Leon Jackson *The Business of Letters: Authorial Economics in Antebellum America* (Stanford, CA: Stanford University Press, 2008), see esp. 3-4 and chapter one, *passim*; see also Ann Fabian, “Amateur Authorship,” in Scott E. Casper, Jeffrey D. Groves, Stephen W. Nissenbaum, and Michael Winship, eds., *The Industrial Book, 1840-1880*, vol. 3 of David D. Hall, ed., *A History of the Book in America*, 5 vols. (Chapel Hill: University of North Carolina Press and American Antiquarian Society, 2007); Christopher P. Wilson, *The Labor of Words: Literary Professionalism in the Progressive Era* (Athens: University of Georgia Press, 1985).

²⁶ William Dean Howells, “The Man of Letters as a Man of Business,” *Scribner’s* 14 (October 1893): 429-45; Nelson Lichtenstein interprets Howells’s essay as bridging conceptions of literary authors as “gentleman amateurs” and “the hearty acceptance of commercialism by the new professionals,” in Lichtenstein, “Authorial Professionalism and the Literary Marketplace, 1885-1900,” *American Studies* 19, 1 (1978): 45, 48-49; see also Amy Kaplan, *The Social Construction of American Realism* (Chicago: University of Chicago Press, 1988), 43.

While the expansion of the book and magazine trades in the United States provided a welcome boon for writers, Howells stressed that most, “do not live so nicely as successful tradespeople... or as men in the other professions when they begin to make themselves names.”²⁷ If professional authorship had become a viable vocation, it was nonetheless precarious, and by no means certain to confer middle class prestige and status.²⁸ Howells also emphasized another common concern, analogous to scientific worries about the corruption of research by commerce: that the subjection of authorship to the dictates of the marketplace would undermine literature’s aesthetic integrity.²⁹ By the early twentieth century a new generation of writers, including Jack London and Frank Norris, would confidently dispel such reservations, and even embraced the economic imperative and the influence of public taste as a worthy stimulus to literary work.³⁰ A decade after Howells’ assessment of the situation, Norris asserted that the professional author, “should feel ‘his public’ and watch his every word,” and adapt the work as necessary. Such were, for Norris at least, the “responsibilities of the novelist” in the turn of the century literary marketplace.³¹

Though Howells rhetorically aligned the “man of letters” with the “working man,” and expressed his wish, “that I could make all my fellow-artists realize that economically they are the same as mechanics, farmers, day-laborers,” this belied the construction of a “high-literary sphere” in American culture, whose members sought to assert and protect their social status through the guise of stewarding the national culture

²⁷ Howells, “Man of Letters,” 429, 431.

²⁸ Many critical studies of literary realism and naturalism in this period highlight its relation to the construction of middle class identity: Kaplan, *Social Construction*, Glazener, *Reading for Realism*, and Lawson, *Downwardly Mobile*.

²⁹ See for example Howells’ dismissal of “the graceless and inappreciative public” which favours “practical” over “literary” content: Howells, “Man of Letters,” 436.

³⁰ Lichtenstein, “Authorial Professionalism,” 48; see also Wilson, *The Labor of Words*.

³¹ Frank Norris, “The Responsibilities of the Novelist,” in Norris, *The Responsibilities of the Novelist, And Other Literary Essays* (1903; repr. New York: Greenwood, 1968), 3-4.

through the choppy waters created by an upstart “new bourgeois class” of “manufacturers, industrialists, and financiers.”³² Even as the “professional author” was born, the older ideal of the gentlemanly “man of letters” lived on, allowing literary figures to alleviate their fears about the professionalization of intellect by keeping their genteel and learned hands on the cultural tiller. In practice, the two identities – “man of letters” and “professional author” – intermingled in figures like Howells. As Janice Radway has noted, rather than opposing the supposed threat of professionalism: “the new high-literary zone produced another form of professional expertise.” This reconstruction of genteel literary authority under the aegis of professionalism also helped to address the concern over scientific ideals displacing or destroying aesthetic or moral ones. As Radway also observes, “the literary ‘author’ became recognizable as an identifiable social figure whose ‘genius’ and presumed endurance was constituted in opposition to,” among other things, “the purported technicism and obsessional specializations of university-based academics.”³³

The seeming schism between literature and science in the late nineteenth century was thus a consequence of social and institutional transformations which differentiated and stabilized the respective identities of the “scientist” and that of the “professional author.” Yet amid these transformations scientists themselves explicitly sought to contribute to the literary culture of their time. To recognize and understand this

³² Howells, “Man of Letters,” 445; Janice A. Radway, “Learned and Literary Print Cultures in an Age of Professionalization and Diversification,” in Carl F. Kaestle and Janice A. Radway, eds., *Print in Motion: The Expansion of Publishing and Reading in the United States, 1880-1940*, vol. 4 of David D. Hall, ed., *A History of the Book in America* 5 vols. (Chapel Hill: University of North Carolina Press and American Antiquarian Society, 2009), 209, 212; see also Richard H. Brodhead, *Cultures of Letters: Scenes of Reading and Writing in Nineteenth-Century America* (Chicago, IL: University of Chicago Press, 1993), 9, on “a distinctive demarcated high-literary culture” which emerged “in the 1860s and after.”

³³ Radway, “Learned and Literary Print Cultures,” 214, 198-99; see also Phillip Barrish, *American Literary Realism, Critical Theory, and Intellectual Prestige, 1880-1995* (Cambridge, Cambridge University Press, 2001).

contribution it is worth turning our attention to the ways in which the representatives of Higginson's "world of science" conceived of literature and authorship. As Richard Brodhead has observed of the distinctions between literary genres, "they differentiate themselves from one another in the act of their composition – and they do so because the writers who produced them internalized and worked from different understandings of writing itself."³⁴ From this perspective we might see more clearly that for many contemporaries science and literature, rather than being inherently opposed, were simply too far apart; and that one way to bridge this gap was to engage more seriously with the literary work of scientific writers.

So it seemed to a young Henry James. In 1871 James reviewed a recent work by the Irish physicist John Tyndall. Although Tyndall's reputation stemmed in the main from his theoretical work on magnetism, *Hours of Exercise in the Alps* reflected his extensive experience of alpine mountaineering, as well as his geological interests. James praised the book in particular for its clear exposition of complex ideas, observing that, "The habit of accurate thought gives a superb neatness to his style," and, "In the midst of chaos and confusion the analytic instinct rises supreme." At the same time, James enthused, Tyndall did not lapse into dry, empirical description, or complex, technical prose. He possessed what James called "the art of flinging over their stern subject-matter that mellow light of sentiment which conciliates the uninitiated mind," revealing not just empirical knowledge but a necessary accompanying emotional response to nature. This combination offered, for James, laudable literary guidelines. "Science we imagine has few such useful friends in literature," as Tyndall, James concluded. "[I]t were much to be wished that literature had a few such friends in science."³⁵

³⁴ Brodhead, *Cultures of Letters*, 10-11.

³⁵ [Henry James,] Review of *Hours of Exercise in the Alps* by John Tyndall, *Atlantic Monthly* 28 (November 1871), 634.

James's evaluation of Tyndall's scientific writing placed no special emphasis on its technical knowledge or its stance of objectivity. Rather, truthfulness and accuracy were the assumed counterparts to the rigorous scientific style and clarity of exposition. This was not absolute objectivity, but rather what exponents of both scientific and artistic realism at the time often called "truth to nature."³⁶ John Ruskin, especially through the five volumes of his *Modern Painters* (1843-60), had become the leading critical exponent of this realist aesthetic, and his ideas strongly influenced American writers and artists.³⁷ The "truth to nature" idea was not conceived narrowly as a principle of *either* scientific knowledge or artistic achievement: rather, each was assumed to feed into the other. For Ruskin and his pre-Raphaelite followers in Britain, as well as his critical devotees in the United States, the inculcation of both "a perfectly patient, and... delicate method of work," would "ensure" the artist's "seeing truly."³⁸ The sense of vision itself had to be disciplined, before representation could be considered. So it was also for Tyndall the scientist; and for James the literary critic and author of fiction.

In evaluating Tyndall's work and its realism, Ruskin was James's reference point. When compared with Ruskin, a passionate extoller of nature's sublimity, James found Tyndall's pages "pervaded by a cool contagious serenity," a mood which itself mirrored "high mountain air on a still day."³⁹ James's appreciation of Tyndall's scientific writing was, ultimately, down to the precise manner in which the prose revealed the complexity of the natural world, and yet did not attempt, through a falsely

³⁶ Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone, 2007), 55-113.

³⁷ "Expression, sentiment, truth to nature, are essential," Ruskin asserted in the first volume of *Modern Painters*, in *The Works of John Ruskin*, vol. 3, ed. E. T. Cook and Alexander Wedderburn, (London: George Allen, 1903), 204; on Ruskin's influence and the wider contexts of aesthetic discourse see Butler, *Critical Americans*.

³⁸ John Ruskin, *The Elements of Drawing*, in *The Works of John Ruskin*, vol. 15, ed. Cook and Wedderburn (London, George Allen, 1904), 13.

³⁹ [James,] Review of *Hours of Exercise*, 635.

depersonalized stance of objectivity, to conceal Tyndall himself as the observer of this world. James acknowledged, “quite ungrudgingly, the author’s fine habit of egotism. . . . Professor Tyndall indeed gravitates, at all times most naturally, to self-reference.”⁴⁰ In James’s critical estimation it was just as important for non-fictional representations of the natural world to be imbued with an imaginative and aesthetic sensibility as it was for fictional work to offer a persuasive simulation of reality.⁴¹ The relationship between science and literature during the late nineteenth century demonstrates not an underlying opposition between incompatible ways of knowing and forms of writing, but rather an ideal of reciprocity between the creative imagination, empirical sensation, and rational cognition. Nature writing, as in Tyndall’s account of alpine mountaineering, was the perfect vehicle for this fusion: the geological science it often incorporated remained accessible to a general readership, and the context of scientific exploration served as a popular form of literary entertainment. Yet it also had as its protagonists the new avatars of scientific authority. No figure better exemplified these combined traits than Clarence King.

Clarence King: the “Man of Science” as “Man of Letters”

An embodiment of American Victorianism and its contradictions, Clarence King has attracted renewed scholarly attention in recent years. As a man of romantic and literary aspirations, a scientist who came to lead the first federal geological survey, and a Gilded Age entrepreneur who won and lost fortunes in mining speculation and cattle ranching ventures, King was considered by his peers to be a remarkable man of his times. He

⁴⁰ Ibid.

⁴¹ Jonathan Freedman, *Professions of Taste: Henry James, British Aestheticism, and Commodity Culture* (Stanford, CA: Stanford University Press, 1990).

appears all the more remarkable because he also sustained a secret self: for the last dozen years of his life, King passed as an African American named James Todd, and married a black woman from New York, Ada Copeland, keeping his two identities mutually exclusive.⁴²

King was drawn to science – and specifically geology – most of all through romantic aesthetic impulses. As a student at Yale in the early 1860s, he noted that, “I don’t love the practical minutiae or lower details of science, although I work at these for discipline.”⁴³ This combination of an aesthetic impulse tempered by cognitive discipline was at the heart of the literary-scientific culture of the late nineteenth century. King’s aestheticism was the primary component of his mature literary and scientific outlook. After graduating, King moved to New York, where he became involved in a new artistic and critical movement, devoted to the principles of John Ruskin. King joined with artists, critics and architects such as the painters John William Hill and Thomas Charles Farrer, one of the founders of the Metropolitan Museum, Russell Sturgis, and the critic Clarence Cook, in a community of aesthetes who shared Ruskin’s devotion to the principle of “truth to nature.” Together they formed the “Association for the Advancement of Truth in Art”, an American imitation of the Pre-Raphaelite Brotherhood, out of which emerged a short-lived but influential critical periodical, *The New Path* (1863-65).

The New Path’s aesthetic credo was that “the primary object of Art is to observe and record truth, whether of the visible universe or of emotion.... The greatest Art includes the widest range, recording, with equal fidelity, the aspirations of the human

⁴² Thurman Wilkins, *Clarence King: A Biography* (New York: Macmillan, 1958); Wilkins’ biography remains valuable, but more recent interpretations of King in wider social and cultural contexts are: Aaron Sachs, *The Humboldt Current: A European Explorer and His American Disciples* (New York: Oxford University Press, 2007); Martha A. Sandweiss, *Passing Strange: A Gilded Age Tale of Love and Deception Across the Color Line* (London: Penguin, 2009).

⁴³ King quoted in Sachs, *Humboldt Current*, 204.

soul, and the humblest facts of physical Nature.” This was not a simplistic objective realism, but rather an aestheticized and affective realism, wherein “the imagination can do its work, and free invention is possible.” At the same time, this aesthetic also explicitly engaged with scientific knowledge: it relied on “knowledge of external Nature” being “extended and accurate.”⁴⁴ In a late contribution to *The New Path* an anonymous writer explored the interrelations of science and art, in a two-part essay on “Science in Its Relations to Art.” The article asserted that, “The eye is indeed our guide, but we must remember that it is only an aid to the mind, and it depends somewhat on the character and quality of the mind whether it guides us to the truth.” This writer did stray somewhat from the Ruskinian orthodoxy of *The New Path* by joining the positivist Herbert Spencer in chiding Dante Gabriel Rossetti for falling, “into the error of making too quick generalizations from our knowledge of phenomena” in his painting, and thus sacrificing scientific realism to aesthetic idealism. Yet in its emphatic rejection of the assumption that “an excess of knowledge kills feeling,” this piece reflected the broader principle that scientific knowledge and artistic creativity and skill were mutually dependent rather than antagonistic.⁴⁵

There are no indications that Clarence King contributed to *The New Path* himself; in fact, through most of the journal’s short history of publication, King was far from New York, making the early, decisive steps in his own career as a literary geologist and explorer. Over the course of the 1860s, King travelled to the American West several times, first on the corps of the California Geological Survey, and later joining what would become one of the most famous expeditions of the period, the Geological Exploration of the Fortieth Parallel, whose scientific operations he led from 1867-69.

⁴⁴ [Clarence Cook], “Association for the Advancement of Truth in Art,” *The New Path* 1 (May 1863), 11.

⁴⁵ Anonymous, “Science in Its Relations to Art,” *The New Path* 2 (November 1865), 171; Anonymous, “Science in Its Relations to Art [Concluded],” *The New Path* 2 (December 1865), 186, 187.

Appraising this moment in the history of science King invoked the trope of professionalization. The year 1867, he reflected, “marks... a turning point, when the science ceased to be dragged in the dust of rapid exploration and took a commanding position in the professional work of the country.”⁴⁶ Yet from the beginning of his career, King bristled against the demands of such scientific professionalism, from his impatience with the “unpleasant work” it entailed in the field to the burdensome administrative responsibilities it brought with it.⁴⁷ King’s aestheticism formed a bulwark against such social and bureaucratic trends. In his notebooks from this period, King specifically contrasted the “analytical” and “sympathetic” aspects of the study of nature which he nurtured; his own instincts consistently leaned towards the latter.⁴⁸

King’s experiences on various expeditions throughout the 1860s yielded many new items of scientific knowledge, above all in mapping the topography and charting the geological structure of the region; but their immediate cultural significance was sealed through King’s self-consciously literary account of his explorations: *Mountaineering in the Sierra Nevada*, published as a book in 1872.⁴⁹ The form of King’s *Mountaineering* itself highlighted the hybridity of scientific and literary culture: it was initially serialized in the *Atlantic Monthly* in 1871.⁵⁰ The first piece, on “Active Glaciers in the United States” was the most narrowly scientific, detailing the origin of geological surveying in California, and noting key theoretical implications of new research. King mentioned the scaling of some of the vast new peaks of the Sierra Nevada range, such as Mount Shasta,

⁴⁶ Clarence King, *First Annual Report of the United States Geological Survey* (Washington DC.: Government Printing Office, 1880), 4.

⁴⁷ Wilkins, *Clarence King*, 61.

⁴⁸ King, quoted in Sachs, *Humboldt Current*, 204.

⁴⁹ Clarence King, *Mountaineering in the Sierra Nevada* (Boston: Osgood and Co., 1872).

⁵⁰ Limits to the fusion of scientific and literary forms of writing were already evident, however. King also published more technical observations on the expeditions’ findings separately, in the leading specialist scientific journal in the US: “On the Discovery of Actual Glaciers in the Mountains of the Pacific Slope,” *American Journal of Science* 3rd Series, 1 (March 1871): 157-67.

in a cursory and offhand fashion; yet he, and his readers, knew that this was where the romantic appeal of geology and mountaineering really lay.⁵¹ The subsequent articles in the *Atlantic*, which formed the heart of the book published the following year, were structured much more around the dramatic narratives of both King's exploring party and of geological change itself. King compared the geological agents of snow and ice, glaciers and rivers, and now-extinct volcanoes, to figures from Mozart's *Magic Flute*: "As the characters of the *Zauberflöte* passed safely through the trial of fire and the desperate ordeal of water, so, through the terror of volcanic fires and the chilling empire of ice, has the great Sierra come into the present age of tranquil grandeur."⁵² Furthermore, through his exploits in California, King both honoured and, figuratively, conquered John Tyndall: Mount Tyndall was named for the Irish physicist when King himself first climbed it in 1864. King's writings, in turn, offered an Americanization of Tyndall's literary and scientific style. Henry James underlined this parallel between European and American literary-scientific worlds in his review of Tyndall; James enthused that, "Mr. Clarence King" and his expedition, "have been setting fresh examples" of "human audacity, curiosity," and "the great motive energy of our Anglo-Saxon race." King was pushing at the boundaries of both exploration and scientific understanding, to render "our own Western Alps" in a literary style that exceeded even the lauded European.⁵³

As more chapters from *Mountaineering* appeared, they turned away from geological science and exploratory feats to focus on human subjects. In October and November chapters appeared titled, "Kaweah's Run" and "Wayside Pikes." The first was

⁵¹ Clarence King, "Active Glaciers Within the United States," *Atlantic Monthly* 27 (March 1871): 371-77.

⁵² Clarence King, "Mountaineering in the Sierra Nevada, Part I: The Range," *Atlantic Monthly* 27 (May 1871), 604.

⁵³ [James] "Review of Tyndall," 636.

structured around the dramatic solo chase King made on his horse, named for the Kaweah River, to escape two Mexican bandits. The chapter contained virtually no geological details; rather, it was a generic adventure story, sutured into King's larger literary-scientific narrative. It revealed the persistent strain of racial and ethnic superiority that King assumed as a scientific explorer. Describing his first sight of the pair who would become his foes, King wrote: "There was something about their seat [in their horses], and the cruel way they drove home their spurs, that, in default of better reasons, made me think them Mexicans."⁵⁴ King astutely sensed the trap the bandits laid for him as he travelled alone, and gained enough ground when they began the chase – guns were fired, ravines were leapt over, and ultimately our hero galloped off safely, not into the sunset, but "enjoying a sunrise" after a final ride through the night.⁵⁵

The final excerpt from the book was a comic sketch of "Wayside Pikes," a term nominally indicating emigrés from Pike County, Missouri, and used generically to describe poor, uneducated westward migrants, trying to make their way on the California frontier. King's first portrait was of the Newtys, a poor and ragged family of pig farmers with whom he camped while on his own travels. They were depicted with a little affection and a lot of condescension as simpletons who obsessed over the killing of raccoons and the tending of their hogs while harbouring the naïve ambition that King should marry the daughter Susan. Later on, King meets a local artist, Hank G. Smith, from whom he draws a dose of art criticism. Hank complains at one point, adopting a line not too far from that of *The New Path* group: "It's all Bierstadt and Bierstadt and Bierstadt nowadays! What has he done but twist and skew and distort and discolor and

⁵⁴ Clarence King, "Kaweah's Run," *Atlantic Monthly* 28 (October 1871), 397.

⁵⁵ *Ibid.*, 397-405.

belittle and be-pretty this whole doggoned country?... He has n't what old Ruskin calls for."⁵⁶

Imagination informed the narrative's structure and tone. King wondered, in "Wayside Pikes," whether "an artist should arise to paint our Sierras as they are, with all their color-glory, innumerable pine and countless pinnacle, gloom of tempest, or splendor, where rushing light shatters itself upon granite crag, or burns in dying rose upon far fields of snow."⁵⁷ In doing so, he was showing that he himself *could* paint the Sierras, not in a watercolor or oils, but through his literary response, disciplined by the science of geology and a realist aesthetic. Yet if *Mountaineering* presented King as a literary author, the expectations of professional geology also demanded the publication of more formally scientific account of his fieldwork. This appeared in King's *Systematic Geology* (1878), which was packed with empirical detail and technical theories, as well as an explicit orientation towards the practical uses of geological knowledge for mining industries. This text formed the disciplined and professional counterpart to the undisciplined, literary *Mountaineering*. Yet even in the writing of *Systematic Geology*, the hybrid literary-scientific culture was still at work: one source from which King received advice on the prose style of this scientific treatise was Thomas Wentworth Higginson.⁵⁸

In its initial form as magazine articles, and then as a book, *Mountaineering in the Sierra Nevada*, was conceived by King more as a literary than a scientific work. The *Atlantic* editor James T. Fields had initially prompted King's writing by asking the explorer for some "sporting articles" relaying his picturesque stories of exploration and

⁵⁶ Clarence King, "Wayside Pikes," *Atlantic Monthly* 28 (November 1871), 572.

⁵⁷ King, "Wayside Pikes," 571.

⁵⁸ Clarence King, *Systematic Geology in Report of the Geological Exploration of the Fortieth Parallel*, vol. 1, ed. King (Washington DC: Government Printing Office, 1878); Wilkins, *Clarence King*, 206.

adventure.⁵⁹ The resulting work was received in a similar fashion by reviewers. Henry Adams, later a close friend and ardent admirer of King as a literary-scientific intellectual, was initially dismissive of *Mountaineering* as “but a trifle,” betraying merely “the superficial qualities of a lively *raconteur*,” while as we have seen, as a young critic Henry James was more deeply impressed by King’s fusion of scientific insight and literary expression.⁶⁰

It is instructive, then, to view King the explorer-geologist in the context of the wider literary culture in which he was deeply embedded through his own writings, as well as his connections and lofty reputation.⁶¹ King’s experiments with vernacular dialogue in a Western setting, for example, echoed those of his contemporary, who later became a close friend, John Hay, whose popular *Pike County Ballads* came out with the same Boston publisher, James Osgood, the year before *Mountaineering*. Both shared the rustic dialect of Bret Harte’s 1869 story, “The Outcasts of Poker Flat,” set in the same Californian frontier town that King had travelled through on his scientific reconnaissance and described in his literary sketches. King had also published some of his early pieces in Harte’s *Overland Monthly* journal, and personally hosted a sumptuous breakfast for Harte when they were both in San Francisco, and on later travels mingled with Harte, Howells, and James in London’s transplanted American literary scene.⁶² After his death in 1901, King’s literary contributions were foregrounded in memorials. Howells called

⁵⁹ Quoted in Wilkins, *Clarence King*, 139.

⁶⁰ [Henry Adams,] Review of *Mountaineering in the Sierra Nevada*, *North American Review* 114 (April 1872), 445.

⁶¹ As Wilkins notes, even before the publication of his *Atlantic* articles King “found himself cast as a . . . harbinger of the literary nova that blazed in the West,” and he attended the Saturday Club in the company of the likes of Theodore Parker, Oliver Wendell Holmes, Ralph Waldo Emerson, and Henry Wadsworth Longfellow. Wilkins, *Clarence King*, 140.

⁶² Sandweiss, *Passing Strange*, 111; Harte also published a late story featuring a geologist who betrayed his scientific commitment to impartiality for personal profit as a mining consultant, which could well have been influenced by King’s tales of unscrupulous scientific consultants: Bret Harte, “The Passing of Enriquez,” *Century* 56 (June 1898): 230-47.

Mountaineering King's "monument."⁶³ In a reminiscence from a mining engineering journal, King's literary reputation was stressed as superior to Harte's: "Bret Harte's admirable work is more romantic, more artificial, less delicately humorous, and less perfect in style."⁶⁴ King's friends marveled at one small literary effort in particular, originally written as a letter to a Californian friend in 1885, and published in *Century Magazine* in 1886: "The Helmet of Mambrino."

This "fanciful sketch" was judged to be "the most perfect specimen" of King's supposed "mastery of style," even by his geological colleagues.⁶⁵ Like his *Mountaineering* articles, it is presented as an autobiographical account of King's travels, embroidered with its references to Cervantes and Don Quixote, and framed as a comical quest for riches and glory. The story is addressed to "Don Horacio," who was Horace F. Cutter, also known as "the bachelor of San Francisco," and with whom King had enjoyed trips in California and shared a love of Cervantes. It recounts King's own Quixotic wandering through La Mancha whilst travelling in Spain in the early 1880s, when he took it upon himself as a playful quest to find an old barber's basin which he could claim as the fabled "Helmet of Mambrino," and send to Cutter as a souvenir.

The finding of misunderstood relics in the old world of Europe was itself paralleled by what King and Cutter had seen of fellow-newcomers to California, especially those seeking their fortunes in gold. Against the grain of the future-oriented ideology of expansion and manifest destiny symbolized by the western territories that geological exploration had surveyed, King's story represented an eastward regression into the past. King reminded Cutter of a man they had observed together, newly arrived

⁶³ *Ibid.*, 65-66

⁶⁴ Raymond W. Rossiter, "Biographical Notice," in *Clarence King Memoirs: The Helmet of Mambrino*, ed. James D. Hague (New York: Putnam, 1904), 353

⁶⁵ Rossiter, "Biographical Notice," 353; Sandweiss, *Passing Strange*, 251-52.

in San Francisco in the 1860s and with, “all the mad hurry of the nineteenth century at his heels.” This figure stood in for the historical westward migration of peoples through the New World: “He started in the world’s youth a simple, pastoral pilgrim, and we saw him pull up his breathless trotters... rush into the barroom, and demand a cocktail,” before setting off east again, having “apparently satisfied the yearning of ages.”⁶⁶ In Spain, by contrast, King was careful to preserve the markings of history. Once he had secured the barber’s basin from a woman in a nameless village, he only just prevented her from setting about scrubbing it clean, which, “would have scraped away the mellow green film, the very writing and sign-manual of the artist Time.”⁶⁷

Through this rejection of futurity “The Helmet of Mambrino” gave oblique expression to King’s antipathy to the course of economic and social development in the United States, especially as represented by the advances of science. Even in the early 1870s, King had worried to his friend and fellow geological surveyor James Gardiner, that “science goes on and progresses at the *expense* of those absorbed in her pursuit,” and that “in this busy materialistic age the greatest danger is that of total absorption in our profession.”⁶⁸ By the mid-1880s, when “The Helmet of Mambrino” was written, King had largely left behind government survey work, which had culminated in a brief spell as the inaugural director of the United States Geological Survey from 1879 to 1881, and was increasingly engaged in private geological consulting for mining companies, alongside energetic but ultimately failed schemes in both cattle ranching and silver mining. In a letter to Henry Adams of 1889 King found himself “poor, and what is worse, so absorbed in the hand to mouth struggle for income that I see the effective

⁶⁶ Clarence King, “The Helmet of Mambrino,” *Century* 32 (May 1886), 154

⁶⁷ King, “Helmet of Mambrino,” 158.

⁶⁸ Clarence King to James T. Gardiner, 15 Feb. 1873, quoted in Wilkins, *Clarence King*, 174-75.

literary and scientific years drifting by empty and blank.”⁶⁹ King’s scientific vocation had not delivered him the security and intellectual freedom which he craved; such literary efforts as “The Helmet of Mambrino” offered intellectual and aesthetic, rather than financial, compensation. Indeed, Howells noted that King was temperamentally opposed to the notion of professional authorship, at least for himself, and “would have preferred not to own the things he wrote, and kept only for his reward the aesthetic delight he had in doing them.”⁷⁰ In both his scientific and his literary life, King aspired to the role of gentleman amateur, and yet had been forced to undertake the burdens of the modern professional.

“I Must Write a Novel”: Scientists’ Unpublished Fictions

Both in his lifetime and after his death, King’s literary efforts were deemed all the more precious for their rarity. S. F. Emmons, a fellow-geologist who had worked with King in the field in California, noted: “It is practically impossible to adequately characterize King’s literary work, for the greater part of what he did was never published, and very likely never even written.”⁷¹ Howells observed that, “he always vaguely meant to write a great work of fiction, though I do not believe he would ever have done it.”⁷² King himself told his mother in 1876: “I *must* write a novel,” and in the 1880s he indicated to friends that he was working on an extended literary work set in London, although no manuscript was published or has since been found.⁷³ King’s literary achievements were,

⁶⁹ King to Adams, 25 Sep. 1889, quoted in *ibid.*, 324.

⁷⁰ William Dean Howells, “Meetings with Clarence King,” in *Clarence King Memoirs*, 141.

⁷¹ Samuel Franklin Emmons, “Clarence King – Geologist,” in *Clarence King Memoirs*: 290-91.

⁷² Howells, “Meetings with Clarence King,” 141.

⁷³ Quoted in Sandweiss, *Passing Strange*, 232; John Hay, finding King “in delicious vein” in London, enthused to Adams that “he ought to write his novel now.” John Hay to Henry Adams, August 25, 1887, John Hay, *Letters of John Hay and Extracts from Diary* vol. 2 (New York: Gordian Press, 1969), 131.

in part, projected by his admiring friends into this absence. His example suggested the potential of the cultivated scientific intellect to illuminate the literary sphere as well; but the dynamics of scientific and literary professionalism limited that illumination to a fleeting flicker, defined more by wistful ambition than by achievement. More significant than the unwritten texts was what fictional authorship symbolized for King: he did not see the intellectual work of science and literature as oppositional, but rather as complementary. When his mother retorted that King's training and professional work as a geologist seemed to contradict his literary impulse, he replied that, "Geology itself is chiefly a matter of the imagination," and was in fact the, "best training conceivable in constructive imagination."⁷⁴

King was far from alone in nurturing this literary ideal. The geologist J. Peter Lesley also made his professional income through his scientific expertise as a consultant, from 1852 through the 1880s, for railroad and mining companies, as well as a professor of geology and mining at the University of Pennsylvania in the 1870s.⁷⁵ Like King, Lesley chafed at the constraints of his commercial commitments and articulated a similar view of science as a crucial form of training for the imagination. Also like King, Lesley harboured literary ambitions. As a young man in 1850, still wavering between the church, science, and literature as possible vocations, Lesley enthused: "I want to write a novel. What shall it be about?"⁷⁶ Among Lesley's personal papers is a twenty page manuscript from an unfinished, undated, novel, titled "Frank," in which the eponymous protagonist is a "young professor" who flits between geological fieldwork while based in boarding houses and camps, and the urbane intellectual scene of Philadelphia. Frank

⁷⁴ Quoted in Sandweiss, *Passing Strange*, 232.

⁷⁵ Paul Lucier, *Scientists & Swindlers: Consulting on Coal and Oil in Antebellum America, 1820-1890* (Baltimore: Johns Hopkins University Press, 2008).

⁷⁶ J. P. Lesley to James Freeman Clarke, November 3, 1850, in Margaret Ames, ed., *Life and Letters of J. Peter and Susan Lesley*, 2 vols. (New York: Putnam's, 1909), 1, 234.

dispenses philosophical *bons mots* and his extensive etymological knowledge to fellow field-workers. Lesley's fictionalized "man of science" overlaps extensively with the "man of letters," and both reflected Lesley's intellectual self-conception. Some of the comic effects of Western humorist literature, recalling King's *Mountaineering* sketches, are present in the tension between the cultivated learning of the scientist, and the rudimentary and rugged circumstances. The campers eat groundhog for breakfast with broken cutlery, while Frank waxes lyrical about Epicurus, eleventh-century French language, Shakespeare and Walt Whitman, until he is told by one of his exasperated fellow-campers: "It would take a Stoic to live in the same tent with you."⁷⁷

Lesley clearly stresses the wide-ranging intellect of the geologist, who is seemingly happiest when *escaping* the routine demands of scientific labour in the field. Back among his books at his boarding house: "Frank stood and hugged himself to think that here he could revert from his incessant anxious study of phenomenal nature, to the infinite dear Nature within himself.... Here he could sit and ask no questions; be careless of false conclusions; be happy in merely remembering, loving, feeling, living."⁷⁸ The divisions between literary culture and professional science are symbolized by "that monstrous, titantic, mocking, stolid, unsympathetic, and reserved world of the forever wasting, renewing, and rewasting rocks!"⁷⁹ The inexhaustible enormity of scientific inquiry was leavened only by the possibilities of art, and particularly fiction; this avenue of intellectual and aesthetic release remained a persistent ideal within the scientific culture of the later nineteenth century. Lesley in fact wrote to Charles Leland and

⁷⁷ J. P. Lesley, "Frank," undated MS., J. P. Lesley Papers, American Philosophical Society Library, Philadelphia, PA, (hereafter Lesley Papers), 3-7.

⁷⁸ Lesley, "Frank," 11.

⁷⁹ *Ibid.*

expressed his desire to pursue “literary work” and contribute to one of Leland’s new magazines, the *Continental Monthly*.⁸⁰

When the Irish mountaineer and physicist John Tyndall died in 1873, Lesley lamented his passing in a letter. “The more I know of him, the more I feel his perfection as a type man of science.” He felt that Tyndall, for all his scientific strengths, could have done more to indulge, “those charms of lovely imagination which hang like golden clouds over the solid earth, and rich harvests of physical science.”⁸¹ Although ideally interwoven, artistic and scientific sensibilities were dislocated in practice, as Lesley was finding in his own professional experience. Again, literature, and the novel form – specifically, the *unwritten* novel – loomed large. In a letter to his daughter of 1887, Lesley wondered, “What fun it must be to be a poet – when one is a poet. There is nothing I should enjoy more – except being a world–entrancing romancer. A novel is the higher goal of a modern thinker’s ambition.”⁸² Such thoughts came thick and fast in this twilight of his career. In 1891 Lesley mused, “The novel is the most powerful educational tool of our age,” and in 1892 he stressed the extra dimension of reality that novelistic insight made accessible: “[T]he novelist sets us behind the scenes, or upon the stage itself; whereas, in real life we only hear and see the tenth part of the words and deeds even of our most intimate and interesting friends. This is the charm of romance.”⁸³

Lesley’s conception of literary art was riven less by an assumed antithesis between science and literature than the differentiation of scientific and literary *work* that was imposed by the demands of professionalism; indeed, by the end of the 1880s, Lesley had come to abhor the dry bureaucratic labour and empirical fastidiousness that his roles

⁸⁰ J. P. Lesley to Charles Leland, December 31, 1861, Lesley Papers.

⁸¹ J. P. Lesley to Catherine Robbins, March 5, 1873, Ames, *Life and Letters*, 2, 108.

⁸² J. P. Lesley to Mary Ames, November 14, 1886, in Ames, ed., *Life and Letters*, 2, 345.

⁸³ J. P. Lesley to Charles and Mary Ames, May 24, 1891, Ames, ed., *Life and Letters*, 2, 412; J. P. Lesley to Susan Inches Lesley, September 16, 1892, Ames, *Life and Letters*, 2, 420.

as a mining consultant and Pennsylvania's State Geologist required.⁸⁴ There are striking parallels here to the contemporary development of American literary culture. Just as Nancy Glazener posits the innovations and popular reception of "high realism" as a form of "narrative compensation for the routinization" of the working lives of the urban-industrial bourgeoisie, we might also see in the literary aspirations and efforts of "men of science" a creative compensation for the routinization of intellectual life on the treadmill of professional science.⁸⁵

Similarly, for all of Clarence King's scientific attainments, by the 1890s the divide between scientific and artistic ways of knowing had become unavoidable and lamentable, particularly in light of the embedding of scientific methods and disciplines in reformed colleges and new universities. In an article on "The Education of the Future" of 1892, King wrote that, "With all its novel modern powers and practical sense, I am forced to admit that the purely scientific brain is miserably mechanical." Scientific ways of knowing, for King, had lost any remnants of "pure sentiment... spontaneous, joyous Greek waywardness of fancy," or "the temperature of passion and the subtler thrill of ideality."⁸⁶ The rational and empiricist perspective was a necessary but insufficient ingredient of an expansive way of knowing the world, King stressed: "[I]t leaves the whole physical universe to the poet's dreams." But the establishment of independent and rigorous scientific disciplines in his own time had come at the price of such dreams; thus it was with a note of wistful sympathy, and not positivistic triumphalism, that King observed that, "the man of exclusively classical education has already become a half-

⁸⁴ Further discussion of these themes can be found in Robin Vandome, "Nineteenth-Century American Science and the Decline of Letters," in *The Edinburgh Companion to Nineteenth-Century American Letters and Letter-Writing*, ed. Celeste-Marie Bernier, Judie Newman, and Matthew Pethers (Edinburgh: Edinburgh University Press, 2016): 89-102.

⁸⁵ Glazener, *Reading for Realism*, 43.

⁸⁶ Clarence King, "The Education of the Future," *Forum* 13 (March 1892): 21; in presenting his case for the "world outside of science," Higginson cited King's article: Higginson, "World Outside," 33.

quaint, half-pathetic figure, as out of time as Don Quixote.” King was much more than just a historically displaced “classicist,” such as he describes here. Rather, after a career divided between government and consulting scientific work, the pressures of business, and his own literary inclinations, and in light of his homage to Cervantes in “The Helmet of Mambrino,” we see King identifying with the “out of time” Don Quixote, and swimming against the historical tides of the Gilded Age.⁸⁷

The Scientific Writing of Simon Newcomb and Nathaniel Southgate Shaler

As we have seen, literary figures in the 1860s warily sensed the capacity of science “to conquer even literature, and then reproduce society completely changed.”⁸⁸ Such predictions proved grandiose, but persisted in the discourses of both literary critics and scientists. Appraising the principles of realism and naturalism extolled by Émile Zola, one critic in 1890 denigrated the pretensions of the “scientific method in fiction.”⁸⁹ Scientists themselves were also sensitive to what Thomas Chamberlin, a geologist at the University of Chicago, called “the slow permeation of scientific thought, and the scientific method and spirit and taste” in American culture at large. This began with “those who especially cultivate science,” but gradually reshaped “the sympathies and tastes of the cultured masses,” and ultimately seeped “insensibly and invisibly through the whole thinking body.” Such “changes wrought in the substance of thought” were powerful, Chamberlin argued, and had even “eliminated some of the choicest fields of

⁸⁷ King, “The Education of the Future,” 28.

⁸⁸ Leland, *Sunshine in Thought*, 147.

⁸⁹ W. R. Thayer, “The Scientific Method in Fiction,” *The Open Court*, 26 Jun. 1890, 2347-2350.

former literary effort,” as the “advance of knowledge... curtailed the field of fancy and impoverished the domain of the literature of the imagination.”⁹⁰

Such invocations of the subordination of literature to science provided an appealingly clear explanation of what was actually a more complex historical process of intellectual and cultural reorientation. Beneath the surface of a supposed schism between science and literature, the turn of the twentieth century in fact witnessed the entrenchment of the cultural divide between these two ways of knowing and writing as distinct modes of intellectual professionalism.⁹¹ Through the turn of the century, and particularly into the twentieth century, literary writers continued to appraise and speak back to the potentialities of science from their own position of authority, as in such well-known cases as, for example: the development of the genre of “science fiction”; representations of the future in Edward Bellamy’s landmark novel, *Looking Backward* (1888); or fictional characterizations of the supposed archetypal modern scientist, such as Max Gottlieb in Sinclair Lewis’s *Arrowsmith* (1925).⁹²

What separated science and literature was less an insurmountable intellectual division, and a relation of hostility, than socio-cultural distinctions which ossified the identities of the “professional author” and the “scientist,” and thus alienated both from their common culture. The likes of Clarence King and J. Peter Lesley had aspired to

⁹⁰ T. C. Chamberlin, “The influence of Science on Literature,” undated MS., The Papers of Thomas Chrowder Chamberlin (1843-1928), Special Collections Research Center, University of Chicago Library, Addenda: Box 8, Folder I, 2-3, 9-10.

⁹¹ For wide ranging discussions of this phenomenon, see the essays in Amanda Anderson and Joseph Valente, eds., *Disciplinary at the Fin de Siècle*, eds. (Princeton, NJ: Princeton University Press, 2002).

⁹² On the relatively belated development of science fiction in American literature, see Gary Westfahl, “The Mightiest Machine: The Development of American Science Fiction from the 1920s to the 1960s,” in *The Cambridge Companion to American Science Fiction*, ed. Gerry Canavan and Eric Carl Link (Cambridge: Cambridge University Press, 2015): 17-30; on the significance of Bellamy see Daphne Patai, ed., *Looking Backward, 1888-1888: Essays on Edward Bellamy* (Amherst: University of Massachusetts Press, 1988); on *Arrowsmith* see David A. Hollinger, “The Unity of Knowledge and the Diversity of Knowers: Science as an Agent of Cultural Integration in the United States Between the Two World Wars,” *Pacific Historical Review* 80 (May 2011), esp. 223-25.

transcend such distinctions and participate in a genteel culture of letters that ultimately proved incompatible with their roles as professional scientists. By the early twentieth century some scientific thinkers still retained this literary impulse; yet they did not struggle in the same way with the dilemma of professionalism. Scientists with literary aspirations indulged them, if at all, on the cultural margins and not as a central aspect of their vocation, and from the security of more stable university and college professorships in scientific disciplines, or as directors of large research bureaus. The hybrid literary-scientific culture had become ever more fragile, and the “scientist” and the “professional author” constituted distinct vocational and intellectual identities, even if some figures continued to wear both masks. At the opening of the new century, the mathematician and astronomer Simon Newcomb did successfully participate in the cultural sphere of the professional author by publishing both popular science essays and fictional short stories in mass magazines such as *McClure's*.⁹³ Newcomb also enjoyed exalted positions in leading academic and administrative institutions, having worked for decades at the heart of government science as superintendent of the U.S. Nautical Almanac Office, and in a professorship at Johns Hopkins University. He was an eminent representative of professionalism in science, and unlike such vocationally conflicted scientist-writers as King and Lesley, Newcomb extolled its virtues.⁹⁴ From such a position of professional security, Newcomb was able to succeed where his would-be gentlemanly precursors

⁹³ Simon Newcomb, “The Coming Total Eclipse of the Sun: What Astronomers Hope to Learn from This Eclipse,” *McClure's Magazine* 15 (January 1900): 45-53; idem., “The End of the World,” *McClure's Magazine* 21 (May 1903): 3-14.

⁹⁴ Albert E. Moyer, *A Scientist's Voice in American Culture: Simon Newcomb and the Rhetoric of Scientific Method* (Berkeley: University of California Press, 1992); Newcomb's endorsement of professional values in science is also evident in Simon Newcomb, “Science and the Government,” *North American Review*, 170 (May 1900): 666-78, and “The Organization of Scientific Research,” *North American Review*, 182 (January 1906): 32-43.

failed: he did write and publish a novel, a utopian science fiction which placed the authority of scientific professionalism at its centre.

His Wisdom, The Defender (1900), was set in the United States and Europe, opening in the year 1941, and focused on the grand schemes of Archibald Campbell, an entrepreneurial scientist who used his technical knowledge of a newly discovered chemical, “etherine,” to enable new transportation technologies, including that of intercontinental flight.⁹⁵ The imagined aircraft developed by Campbell’s own international research corporation offered a means of facilitating a “Golden Age” in global diplomacy, through omniscient surveillance and rapid communication. Campbell was first faced with the establishment of a coalition of monarchical powers in Europe, led by Germany, against the seeming threat of this new technology; but through both military maneuvering and the promulgation of Campbell’s scientific ideals, the hero was ultimately installed as a global “Defender of the Peace of the World to All Mankind,” while the German and Russian standing armies were cut.⁹⁶

Any traces of King’s Ruskinian realist aesthetic were absent from Newcomb’s science fiction; rather than seeking to filter the empirical experience of the natural world through a disciplined creative sensibility, Newcomb projected the instrumental and political potential of science into the future. His protagonist, the red-headed and eccentric Campbell, personified the heroic intellect as “a scientific investigator, the main object of whose life had been to benefit his fellows.” In recruiting new employees at his vast Anita Company, it was noted that Campbell took “the greatest interest in able young men studying a profession.”⁹⁷ This utopian science fiction was itself deeply committed to the virtues of professionalism which had deepened the divide between scientific and

⁹⁵ Simon Newcomb, *His Wisdom, The Defender* (New York: Harper, 1900).

⁹⁶ *Ibid.*, 314-16.

⁹⁷ *Ibid.*, 109, 46.

literary culture in Newcomb's own time, and which had formed the basis of Newcomb's own intellectual career and success.

His Wisdom was politely received as a "romance of the scientific imagination," and "a tale as startling as any told by M. Jules Verne," deemed to possess, "even to the searching criticism of exact science... no slight degree of verisimilitude."⁹⁸ While Newcomb's novel imaginatively projected the scientific mind into the future, however, it placed little emphasis on the aesthetic principles which King and Lesley had sought to embody in the face of the merely "mechanical" workings of scientific cognition. By the 1890s, King and Lesley seemed to be reconciled to the prospect of maintaining the world of literature, and especially the novel as a "romance," as an avenue of escape from the grinding empiricism and overbearing pressures of professional science. In contrast Newcomb's bombastic scientific romance presented the scientist not as a cultured aesthete but a pragmatic public figure committed to the social utility of their research. Even as Newcomb himself crossed the divide between professional author and scientist, his literary contribution abandoned the notion of literary-scientific hybridity as an aesthetic ideal, and instead confirmed the alienation of scientific from artistic life.

The geologist and professor of natural history, Nathaniel Southgate Shaler, provides a final example. Shaler's career had included state-funded geological research in his native state of Kentucky, but was rooted at Harvard, where he taught what was the university's most popular course by the turn of the century: his "Elementary Geology" was described as providing "all the geology necessary to a gentleman."⁹⁹ Towards the end of his career Shaler noted in discussions with his literary colleagues and friends that,

⁹⁸ William Morton Payne, "Recent Fiction," *The Dial*, 16 Dec. 1900, 499; see also "Literary Notes," *New York Evangelist*, 28 Jun. 1900, 16; "Mr. Newcomb's Romance," *The Literary World*, 1 Nov. 1900, 221-22.

⁹⁹ Quoted in Philip J. Pauly, *Biologists and the Promise of American Life: From Meriwether Lewis to Alfred Kinsey* (Princeton: Princeton University Press, 2000), 108.

“they, as well as many of my fellow students of nature, are convinced of the essential incompatibility of science and the humanities.”¹⁰⁰ The most compelling cautionary example of this incompatibility came from Darwin’s own admission, mentioned earlier, that immersion in scientific research had dulled his aesthetic sensibilities. Shaler was prompted by Darwin’s confession to tackle the underlying question of whether “there is something in the quality of scientific work which inevitably leads to a loss of imaginative power.”¹⁰¹ Shaler’s own outlook preserved the blend of speculative scientific theory and elements of the Ruskinian realist aesthetic which informed King’s view of science. He clearly expressed his own “belief that the work of the naturalist in interrogating his world of facts differs in no essential way from that of the poet in elaborating his fancies.” Both relied on “the constructive imagination” which Shaler deemed the critical basis of knowledge in “any field of happenings,” whether it be “in the soul of man” or “in the stars.”¹⁰² Both had to visualize unseen realities.

Shaler thus embarked on an explicitly experimental literary work, though one with profoundly a conservative aesthetic aim: a five volume Elizabethan verse drama. An early scene sees the young Elizabeth reading from Plato’s *Republic* and musing on the tension between the philosophical ideal of the state and the messy reality of the one over which she will reign: “...in a world where men have set so high / The targets of their thought, we too may send / The arrows of our fancy towards the sun, / And if in vain, still have we fairer drawn / Than at some near and momentary aim.”¹⁰³ Shaler’s intention was not to produce a historically accurate poetic narrative, but rather to explore the capacity of the scientific mind to produce a work of literary coherence and

¹⁰⁰ Nathaniel Southgate Shaler, *Elizabeth of England: A Dramatic Romance in Five Parts, I: The Coronation* (Boston: Houghton Mifflin, 1903), vi.

¹⁰¹ *Ibid.*, v.

¹⁰² Shaler, *Elizabeth*, vi.

¹⁰³ *Ibid.*, 13.

intellectual interest. It was thus an interdisciplinary exercise in authorship, in which Shaler employed the method of “visualiz[ing] every scene in precisely the way my occupation had taught me to shape an imagined set of conditions in the physical realm.” By employing scientific habits of thought, Shaler found, “the seemingly impossible task suddenly became easy.¹⁰⁴ He concluded that: “It... appears to me clear that the capacity has been developed by labors which though relating to the external world are essentially akin to those of the dramatist. Both alike train the constructive imagination in the art of building the memories of things observed into new things.”¹⁰⁵

Shaler’s literary experiment was deliberately undertaken outside the domain of professional authorship: he wrote with “no thought of publication beyond my own household.”¹⁰⁶ In this sense he continued in the tradition of King in envisaging literary work as compensation for the rigours of scientific work. But the reception of the work also highlights the contrast between such literary-scientific texts as *Mountaineering* and *Elizabeth of England*. A reviewer in the *Atlantic* received Shaler’s verse drama as a “curious expression of the modern scientific spirit,” and judged it to be more a source of methodological interest than literary merit.¹⁰⁷ In Shaler’s subjection of artistic and literary creativity to scientific experiment, we find none of the adulation such as Howells afforded to King when he wrote, “As an artist, as a realistic observer, every kind of life appealed to him for report; and he was one with it.”¹⁰⁸ While King’s “monument,” *Mountaineering in the Sierra Nevada*, was read by his peers as a testimony to the creative potential of the adventurous scientific intellect, Shaler’s five-volume imitative

¹⁰⁴ Ibid., ix.

¹⁰⁵ Ibid., xiv-xv.

¹⁰⁶ Ibid., xi. Shaler also had a collection of poetry published posthumously, which he had planned to have published before his death: Nathaniel Southgate Shaler, *From Old Fields: Poems of the Civil War* (Boston and New York: Houghton Mifflin, 1906).

¹⁰⁷ H. W. Boynton, “A Novel Experiment in Poetry,” *Atlantic Monthly* 93 (February 1904), 275.

¹⁰⁸ Howells, “Meetings with Clarence King,” 154.

Elizabethan drama appears instead as an example of the constrictions now placed on the imaginative scientific mind. Rather than crafting a simultaneously disciplined and creative response to the wonders of nature, Shaler deployed scientific method as a *substitution* for the author's own imagination. Shaler's recovery of a lost dramatic form, unlike Newcomb's futuristic science fictions, located scientific literature at a dead end rather than a new beginning. Finally, in its intended separation from the literary marketplace, Shaler's text was conspicuously non-professional, the product of a personal intellectual experiment rather than a response to the demands of a wider public.

In the larger shift from the 1870s to the 1900s, and through comparisons of figures like King, Lesley, Newcomb and Shaler, certain patterns in the dialectic between literature and science as modes of intellectual life and work in the United States can be identified. Many among the literary elites of the early Gilded Age regarded the influence of science polemically and reductively because they sensed in the rise of scientific standards and domains of expertise a challenge to their cultural authority. But scientists such as King and Lesley shared much with this outlook as well. They took a broadly Arnoldian view of the nascent "two cultures" divide, and imagined themselves as simultaneously scientific and literary intellects, while expressing scepticism about the potentially corrosive effects of excessively narrow scientific work on their culture. As the domains of professional scientific and professional literary work became more clearly distinguished, however, the combined literary-scientific ideal faded further. King and Lesley pursued the path of the professional scientist, but only reluctantly and at the expense of their literary aspirations. By the turn of the twentieth century the literary efforts of scientists such as Newcomb and Shaler, who had gone further and more successfully down the professional path, thus appeared in a cultural no-man's-land between the marketplace of literary authorship (to which they were profoundly marginal)

and the specialist work of the scientist (to which they did not conform). Ultimately, the hybrid literary-scientific culture of the Gilded Age was eclipsed because the intellectual labour required to sustain it was bifurcated along the new and divergent lines of the “professional author” and the “scientist” as vocational identities. The boundary between these identities was by no means absolute, but it was a decisive factor in shaping the contours of intellectual life, and it diminished the possibility of imaginatively constructing a common literary-scientific culture.*

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