

A network diagram with glowing nodes and connecting lines, transitioning from dark blue to light blue. The nodes are small circles in various colors (white, blue, green, red, purple) and are connected by thin lines, creating a complex web of connections. The background is dark blue, and the overall effect is a sense of digital connectivity and data flow.

The Palgrave Handbook of Twentieth and Twenty-First Century Literature and Science

Edited by
The Triangle Collective

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Palgrave Handbooks of Literature and Science

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This series of handbooks is devoted to the study of the rich and complex history of the relationship between literature and science, from medieval times to the present moment. While this is a topic not unknown to literary criticism (especially in the middle years of the 20th century), the work assembled in these five volumes represents a fundamentally new approach to the vital story of the interconnectedness of literature and science, an approach that is grounded firmly upon an understanding of the status of both literature and science as discourses dedicated to the production of knowledge.

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Patrick Jagoda · Erin Gentry Lamb ·
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See next page

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We dedicate this work to the many whose lives have been adversely affected by the pandemic that has swept across the globe while this work came to fruition, revealing at every turn the inextricable links among science, politics, and society, the inequities of our global society, and the paramount importance of careful and critical acts of reading, responding, and caring for one another, in every field and in every encounter. We acknowledge both the hopeful role and the limits of knowledge communities as we move into a future in a world that gives privileged voice and access to some, while denying the very right to breathe for a great many more.

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PRAISE FOR *THE PALGRAVE HANDBOOK*
OF TWENTIETH AND TWENTY-FIRST CENTURY
LITERATURE AND SCIENCE

“This is an eclectic collection in the very best of ways: wide-ranging in genre, method, and conceptualisation. Most valuably it reveals a democratising impulse that speaks directly to the contemporary politics of literature and science, illuminating the field’s strength in bringing together scholars in a united effort of understanding.”

—Martin Willis, *Professor of English, Cardiff University, UK, and Editor,*
Journal of Literature and Science

“This superb collection finally puts to rest the myth of ‘the two cultures’ by comprehensively showing how, over 120 years of accelerating transformations, literature and science have become inseparable. The volume will be at the forefront of debates about the interconnectivity of twentieth and twenty-first century thought, culture, and practice.”

—Martin Halliwell, *Head of the School of Arts and Professor of American Studies, University of Leicester, UK, and author of American Health Crisis: 100 Years of Panic, Planning and Politics (forthcoming)*

“This exciting collection is an excellent contribution to the field of literature and science. It is ideally suited for class adoption for courses in this and related areas such as science and technology studies, literature and medicine, and literature and technology. The section on ‘Ethics and Politics’ is an especially welcome exploration of the issues that the editors bring up in their introduction, wherein the positionality of one’s own discipline and institutional setting is, far from being ignored in the analysis, very much included as a part of it. Highly recommended for humanities scholars and others interested in interdisciplinary methodologies and inquires.”

—N. Katherine Hayles, *author of Postprint: Books and Becoming Computational (2020)*

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Introduction

The Triangle Collective

In his oft-referenced 1959 Cambridge lecture on “The Two Cultures,” British novelist, physicist, and civil servant C.P. Snow famously resurrected an erstwhile lament about a presumed and growing “gulf” between the arts and the sciences in which the sciences are unduly disregarded by the “traditional” intellectual pursuit of the arts. Snow’s scientific evangelism registers a persistent tension in Western cultural history, which we can track from Thomas Henry Huxley and Matthew Arnold’s late-nineteenth-century debates on whether the natural sciences should finally be included alongside literature in college curricula to Bruno Latour’s post-9/11 suggestion that a new form of generative critical “gathering” is needed, one that does not pit scientific pursuits against cultural critique, but treats all constructed objects and ideas with caution and care (Snow 2012; Huxley 1880; Arnold 1882; Latour 2004).

Indeed, this manufactured “two cultures” paradigm is now so fully ingrained in our contemporary era that shocked post-2016 liberals were prepared to march for the abstract concept of science as the incontrovertible panacea to the post-truth era of Trump, an era of dangerous relativism inaugurated, some would argue, by art and theory’s post-structuralist insistence on the relativity of truth and reality. Once the perceived gatekeepers of intellectual endeavor, the humanities meanwhile find themselves on the other side of the “two cultures” coin, labeled as an esoteric and impractical field of knowledge that has also unwittingly sowed the seeds for a war against facts from which only science, technology, engineering, and mathematics (STEM) fields can save us.

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Yet however counterintuitive it may seem in our current moment—which has witnessed the alliance of scientific research and global capital, as well as the facile opposition of useful scientific “know-how” (useful to whom and for what?) against the supposedly rarefied humanities—*literature* and *science* have been and continue to be domains of knowledge that are, far from monolithic, perpetually in flux and intertwining. For example, in the vibrant fields of feminist science studies and the history of science and medicine, many scholars have documented the capacious meanings and practices of science and literature in earlier centuries. Initially, “science” referred to knowledge as such. Yet with the rise of empiricist paradigms in the sixteenth and seventeenth centuries (following Francis Bacon’s articulation of the scientific method) up through the technological developments brought by the industrial revolution in the eighteenth and nineteenth centuries, definitions of science began to narrow. And as the modern research university emerged in the late eighteenth and early nineteenth centuries, as academic disciplines began to coagulate—though they had not yet calcified—into distinct research programs, *science* increasingly specified a particular kind of knowledge, one derived from empirical procedures and tightly focused on the study of the natural world. Nonetheless, science in this earlier moment was not viewed as inherently oppositional to the more imaginative, speculative knowledge that literature represented. More often than not, the two worked together.

Up through the nineteenth century, in other words, science and literature did not even name distinct fields of study. Embryology, for instance, arose around 1800 as a science that sought to explain how living organisms continually change while still being able to organize themselves independently; it gave rise to the concept of rhythm, which became “a new way of imagining that played a critical role in the consolidation of the new science of biology” that cut across aesthetics, poetics, and philosophy (Wellmann 2017, 17). In another notable example, as Amanda Jo Goldstein (2017) argues, Romantic writers such as Blake, Shelley, and Goethe developed a “sweet Science” that deployed classical philosopher Lucretius’s poetic materialism—the idea that tropes have physical substance and physical things are capable of figurative activity—to challenge the reorganization of knowledge spurred by the modern university, which invalidated poetry as a way of knowing the natural and social worlds. While the natural sciences were turning toward the problem of organic life, Romantic writers and thinkers redeployed Lucretian materialism in order to bolster poetry’s claim upon the real. Thus, the gap between the epistemic communities of the natural sciences (biology, geology, astronomy, physics, and chemistry) and “human science” (the humanities and social sciences) widened not simply along a methodological fault line (inductive versus deductive logic) but, Goldstein points out, along a linguistic one as well: prose the dominant medium for describing the natural and social world “as it is,” and poetry the medium for describing the “immaterial reaches of subjectivity,” including

emotion and memory (Goldstein 2017, 7). Using figuration and verse to remake empirical procedures, these literary experiments sutured scientific and aesthetic knowing.

These particular examples of the cooperation of science and literature illustrate that in many pre-twentieth-century contexts the literary—contingent, figurative, subjective—was widely understood not to supplement empirical knowledge of the world but, rather, to arrive immanently within it. Not yet fully professionalized, science was a capacious mode of inquiry “legitimately claimed by a surprisingly broad range of practitioners and practiced in a number of nonacademic and noninstitutional spaces, from the parlor to the workshop, the church to the park,” Britt Rusert (2017) points out (5). Indeed, as she shows, in the early-nineteenth-century United States a set of “fugitive sciences” emerged that saw free and enslaved African-Americans repurpose ethnology, astronomy, and botany in the name of freedom. Excluded from most if not all institutions of learning, these “amateur” scientists fused empirical procedures with speculative thinking, as their investigations of the natural world became the basis for broader meditations on kinship, being, and the category of the human.

Speculation frequently plays the foil to the practical applications of knowledge codified by Bacon’s scientific method, yet even amid the dominance of the empiricist paradigm from the sixteenth through nineteenth centuries, it remained central to the kind of undertaking science was understood to be. *Speculation*, in some ways, serves as the hinge upon which literature and science have pivoted for so long: a form of thought that is fundamentally concerned with querying “abstract” notions (of being, of beauty), and a form of thought that unfolds in the subjunctive grammar of potentiality, the future possibilities of the *could be* or *might be*. However much it emphasized specialization by the end of the nineteenth century, science “remained a discipline that was not one,” as Nihad Farooq (2016) writes, offering “as much in the way of philosophy, literature, travel narrative, cultural study, and social theory as it did in the way of ‘pure’ science” (11).

The focus of this handbook is the twentieth and twenty-first centuries, even as both the editors and the contributors resist the popular tendency to view earlier scientific practices through an arguably twentieth-century lens of hierarchy and fixity. While phrenology, taxonomy, eugenics, and the general depiction of racially based traits as unyielding markers of inferiority or superiority are all certainly woeful *narratives* that plagued science in the nineteenth century, the *actual* science that came to fruition in this period proved quite the opposite: that all organic processes are, in fact, in constant flux, transforming and transformative, adapting, changing, mobile, and most importantly, that human beings are not biologically separable by any kind of discrete racial markers. To this end, we approach science and literature in the twentieth and twenty-first centuries as interactive modes of knowledge that carry forward historical practices of speculation, fugitivity, and amateurism.

However, the distribution of scientific expertise beyond disciplinary modes of knowledge production becomes harder to sustain in the twentieth century. Literature and science remain co-evolving speculative forms even while significant differences arise in their material conditions and methodological identities as they become institutionalized within the university. Nowhere is the division between the humanities and the sciences more obvious than in the study of language in the early twentieth century. As philology split into the distinct paths of literary criticism and linguistics, hermeneutics became the basis of close reading (think F.R. Leavis) and logical positivism dominated the philosophy of language (think Bertrand Russell). One critic, I.A. Richards, actually crossed this chasm, and yet these two sides of his professional career—an interpretive literary critic on the one hand and the co-designer of an artificial language called Basic English on the other—have largely remained isolated from one another. As those in the field of literary studies start to remember the more positivist endeavors of its leading lights, it is possible that literary methods will become more computational (as we see in the rise of quantitative methods in the digital humanities), but it is unlikely that computation will displace hermeneutics as the core of disciplinary identity.

If logical positivism turned the study of language toward computation, then the development of the digital computer turned science ever more firmly, if problematically, toward the language of code. Although DNA was discovered in 1869, it wasn't until the 1950s, shaped as they were by cybernetics, information theory, and wartime and Cold War cryptography, that sciences such as molecular biology reimaged DNA as the “code of life.” With the growth of computer power, neuroscience and genomic science have increasingly relied on computational methods and processing that require considerable funding for research.¹ Representative here is the Human Genome Project (HGP), which set out to sequence and map the entirety of the human genome, spanning from 1990 to 2003 and representing the efforts of multiple institutions across the globe.

Indeed, during the postwar era of “Big Science,” scientific projects expanded significantly in size and required considerable funding. Much of this work has been conducted in the laboratories of universities and private companies and is beholden to the funding bodies, both public and private, that enable this work. This financial structure, in turn, opens up scientific research to the objectives of the funding organization, whether noble or otherwise, such as the goals of for-profit commercialization (e.g., the extension of the HGP into DNA testing kits or proprietary pharmaceutical formulas) or social control through the continuation of racist and eugenic narratives (again, DNA testing kits)—even as the tests have also sometimes proved useful to others as a way to probe complex questions of cosmopolitan identity in the present and to correct lies and omissions in the historical record. Or consider the case of US university-based robotics and artificial intelligence

research in the mid- to late-twentieth century, much of which was funded by Defense Advanced Research Projects Agency (DARPA), in the name of militarization and strategic defense.

And yet, Snow's two cultures diagnosis does not hold in the contemporary era any more than it did in the eighteenth and nineteenth centuries, as the practice of science does not stand in isolation from the larger political and cultural milieus its practitioners inhabit. Rather, science, like all forms of knowledge production, is co-evolutionarily constituted by and with these milieus. Katherine Hayles makes this point in her 1990 study of the concept of chaos across postmodern literature, critical theory, and sciences including mathematics, thermodynamics, and epidemiology; she notes that the connections she identifies across these fields emerge because "writers, critics, and scientists, however specialized or esoteric their work, all share certain kinds of everyday experiences" (Hayles 1990, 4). In other words, literature and science are decidedly worlded practices that unfurl and unfold each other.

Working in the shadow of Big Science, scholars in feminist science studies have been essential to undercutting the "two cultures" claims. Donna Haraway's (1988) feminist objectivity emphasizes that knowing is ever situated, or shaped by the specific position of the one seeking to know, and thus ever partial. Similarly, feminist theorist and theoretical physicist Karen Barad (2007) describes scientific observation as informed by the scientific observer and the techniques and technologies deployed in observation. Thus, science, which is often characterized by authoritative claims of neutrality and disembodied objectivity (indeed, an impossible subject position!), is in fact shaped by specific worldviews, positions, and epistemological assumptions and tools. Science shares this quality with literature, as well as with other cultural practices that seek to know something of the world. To understand science as such is not to prescribe a slippery, untethered relativism, but rather to insist that a rigorous scientific account acknowledges that what we know of the world is shaped by how we come to know it, a methodological claim familiar to many working in the humanities.

It is important to note, of course, the political and intellectual significance of inquiry in the humanities in its work to debunk the "fake news" most often proffered historically by pseudo-scientific narratives—i.e., the "science" of races as separate species; the "science" of hysteria as a "female disease"; the "science" of same-sex desire as pathological; and so forth. The intent of the arts, and of critical theory specifically, as Latour (2004) defends in his own contemporary lament, "was never to get *away* from facts but *closer* to them" (231, emphasis in original), by examining and challenging the conditions of certain historical moments that have allowed blatant falsehoods and discriminatory logic to be delivered as facts or truths.

It is, then, not surprising that the emerging field of literature and science coincided with the increasing attention to problems of social inequality, power, and violence and efforts to make scholarship relevant in part by