

The Modern Origin Story As A Literary Genre



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Abstract

In the twenty-first century, the theories of modern science are radically altering the ways we perceive life and the universe. They are doing so more swiftly than at any other point in human history. Consequently, modern creation accounts are deviating more profoundly from traditional ones. In the wake of new scientific theories that speak of where we came from and what we are, a new literary genre has emerged: the ‘modern origin story’.

The genre in question is a complex modern literary hybrid. Modern origin stories are thoroughly interdisciplinary narratives that combine elements of mythology, philosophy, science and literature. They do so for the purpose of pondering the great physical and metaphysical questions that have plagued humankind in perpetuity: ‘Where do we come from? What are we? Where are we going?’

Examining a number of modern origin stories by Lawrence Krauss, Richard Dawkins, Carl Sagan, and Charles Darwin, I illustrate that these narratives are simultaneously academic and colloquial, abstract and personal, and scientific and literary. Moreover they are written for the complementary purposes of informing, persuading and entertaining. I trace the undeniable kinships these narratives share with traditional mythology and literature, whilst exemplifying how their authors have modernised and refashioned traditional tropes and ideals.

By examining scientific texts as literary works, and by acknowledging the fundamental literary kinships that exist between traditional and modern accounts of creation, I maintain that literary critics will be well placed to understand a number of important evolutions in modern aesthetics, values and literary forms. Consequently, we may more readily acknowledge that literature is a perpetually evolving phenomenon, devoid of an immutable essence.

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A good story is by its nature suggestive and open to new interpretations, not one thing fixed forever.

– Mary Paumier Jones, “The Storytelling Animal” (1996)

*Much human ingenuity has gone into finding the ultimate Before. The current state of knowledge can be summarized thus:
In the beginning, there was nothing, which exploded.*

– Terry Pratchett, *Lords and Ladies* (1992)

Introduction

We are obliged by the deepest drives of the human spirit to make ourselves more than animated dust, and we must have a story to tell about where we came from, and why we are here. Could Holy Writ be just the first literate attempt to explain the universe and make ourselves significant within it? Perhaps science is a continuation on new and better-tested ground to attain the same end.

– Edward O. Wilson, *Consilience* (1998)

'Where do we come from? What are we? Where are we going?' Such was the tripartite question posed by the painter Paul Gauguin in his mythic 1897 pictorial allegory of the human life-cycle; and such are the perennial questions that dwell at the heart of every origin story ever conceived: from the *Popol Vuh*, to *Genesis*, to Charles Darwin's *The Origin of Species*, to Carl Sagan's *Cosmos*. "Homo sapiens is the storytelling animal" (Paumier Jones 649) and every human society has devised origin stories and creation myths as a means of explaining natural phenomena, the human place in the universe, and the moral imperatives that, by contextually relative standards, 'should' govern human action and existence.

Over time, human origin stories have undergone "a series of increasingly diverse tribal mutations in a continual evolutionary flux that stretches to the present day" (Wilson and Bowen 9). Consequently, such narratives have grown ever more sophisticated in terms of their rigour and veracity, as well as their structural and conceptual complexity. As I will emphasise throughout this thesis, we live in a global, post-industrial society in which contemporary accounts of human origins and essence are no longer primarily compiled by theologians and philosophers (Otis xx). In the twenty-first century, the theories of modern science are engendering the revision of traditional metaphysics and origin accounts on an unprecedented scale, prompting us to "consider ideas that could not even have been formulated a century ago" (Krauss 2011; 178). Such novel ideas have exerted a profound

influence on contemporary societies, belief systems and origin stories, and have concurrently helped to redefine the limits and expectations of modern literature, mythology and identity.

As Joseph Campbell recognised in the twentieth-century, a “new mythology” (7) has emerged in the modern era, which, for the first time in human history is both scientific, and global. The interdisciplinary mythologist Gregory Schrempp concurs, noting in his 2012 monograph *The Ancient Mythology of Modern Science*, that a “new program of mythologising” (218) is occurring today, with modern creation myths being propagated in growing numbers through popular science writing and science-based exposition. As I will demonstrate, such myths are not only expressions of scientific theory; they are also literary endeavours, which are rendered cogent, convincing and accessible through their complex literary forms.

In the ensuing chapters, I will consider the content, context and literary merits of a number of contemporary origin accounts, which I classify using the generic nomenclature ‘modern origin story’. The term serves to delineate scientific accounts of creation from the wider encompassing pool of popular science writing. Moreover, it creates a conceptual space for an existing, but as yet cloudily defined phenomenon: one that is simultaneously scientific, mythological, philosophical and literary. The use of the term ‘origin story’ implies continuity with earlier fictional creation myths, whilst the addition of the word ‘modern’ alludes to the epistemological discontinuities that render these narratives products of a scientific, industrial, and post-teleological age.

Although the mythologist Barbara Sproul wrote of the incompatibility of science and myth in 1979, declaring the former to be confined to the realm of “facts”, while maintaining that the latter is “an expression of religion” which hones in on questions of “value and meaning” (21), I contend, seconding the philosopher of science, Karl Popper, that science is essentially a “myth-making” (112) endeavour. Like all narratives and myths, science is reliant on

“language” (idem) as its primary communicative tool. Moreover, as a social and political endeavour, it is often most influential when explained through metaphor and analogy – in short, in literary form.

Like much contemporary literature, modern origin stories both engage with, and subvert tradition. They are in essence products of the fluid and rapidly evolving modern literary paradigm, in which “scientists, patrons of science, users of science and readers of novels, are overlapping communities; literature is a shared space where their common forms of truth and value are negotiated” (Sleigh 24). Although the scientific theories underpinning these narratives typically place them in direct conceptual conflict with many early accounts of creation, texts belonging to this genre simultaneously reveal that modern humans are no less desperate than their ancestors to understand “how life is tied into physical processes and how the history of human beings on Earth is bonded to the natural world that gave birth to us” (Haught 3).

In essence, the scientific origin stories of the present are complex and multi-faceted literary hybrids. In these narratives, both the sciences and humanities, and the hard and soft sciences, are placed in constant and conciliatory dialogue. Like other works of popular science, modern origin stories are “a fully-fledged part of scientific discourse” (Curtis 421). However, they are not solely confined to the realms of dispassionate observation and fact. Although their authors adhere to, and revere, the scientific method, these texts are overtly value laden and reflect on questions of morality, metaphysics, origins and essence. Indeed, they serve all definitive functions of traditional creation myths, which chiefly exist, as Sproul notes, for “people [to] set forth their primary understanding of man and the world” (3).

Consider the remarks of the physicists Stephen Hawking and Leonard Mlodinow in their *New York Times* bestseller and modern origin story *The Grand Design* (2010). They write:

Why is there something rather than nothing?

Why do we exist?

Why this particular set of laws and not some other?

This is the Ultimate Question of Life, the Universe and Everything. We shall attempt to answer it in this book. Unlike the answer given in *The Hitchhiker's Guide to the Galaxy*, ours won't be simply "42" (10).

In these lines, Hawking and Mlodinow self-consciously frame their narrative as a modern creation myth; one that addresses the perennial questions that have plagued humankind since our inception. These questions underpin all creation myths and have shaped the Western philosophical tradition, from Aristotle, to Aquinas, to Leibniz to Heidegger. More recently, the philosopher Bede Rundle noted in his 2004 book, *Why There Is Something Rather Than Nothing*, that the query 'why do we exist?' is "philosophy's central, and most perplexing, question" (vii). However, as Hawking and Mlodinow reveal, questions regarding existence and the first cause do not belong exclusively to the domains of philosophy, or to any discipline in isolation.

Amalgamating science, mythology, philosophy and literature, the authors of *The Grand Design* attempt to provide modern answers to enduring existential questions. They implicitly counter non-scientific musings on these subjects, aligning themselves with a scientific ethos that is championed in the popular novels of Douglas Adams. Citing *The Hitchhiker's Guide to the Galaxy*, Hawking and Mlodinow tacitly imply that their own narrative will intersect with the domains of literature and popular storytelling. The conversational levity of their final remark humanises the authors and sets the tone for the heavily analogic explanations to come. However, Hawking and Mlodinow simultaneously reject the implicit frivolity of drawing fictional conclusions to questions regarding existence and reality. Such manoeuvres, in which

authors simultaneously adopt and abandon social and literary precedents, are common in modern origin stories.

Examining a number of texts belonging to this hybrid literary genre, I will exemplify how the authors of modern origin stories exploit many of the key strategies of consummate storytellers for the complementary ends of informing, entertaining and persuading their readers. The texts in question include: Lawrence Krauss' *A Universe from Nothing* (2011), Richard Dawkins' *The Ancestor's Tale* (2004) and *The Magic of Reality* (2011), and Carl Sagan's *Dragon's of Eden* (1977) and *Cosmos* (1980). In addition, I will trace core elements of these texts back to an exemplary nineteenth-century prototype of the genre, Charles Darwin's *The Origin of Species* (1859). As well as being a scientific publication, *The Origin* is a compelling narrative, a deft and popular work of literary art, and a text with profound cultural and mythic resonance. A multi-faceted hybrid based on a scientific worldview, it is perhaps the first modern origin story.

Although modern origin stories have only received significant literary attention in recent decades (that is, contemporaneously with the publication of most texts belonging to the genre), the novelist Aldous Huxley came close to presaging the proliferation of such hybrid narratives in the mid-twentieth-century. Noting that "the proper study of mankind is Man and next to Man, mankind's properest study is nature – that nature of which he is an emergent part" (1963; 91), Huxley pondered what scientists could contribute to the ever-broadening literary imagination, and how raw scientific materials could be fruitfully incorporated "into works of literary art" (68). In a particularly prescient reflection, he noted that, "science sometimes builds new bridges between universes of discourse and experience hitherto regarded as separate and heterogeneous" (94). The modern origin story is one such bridge. In these complex, theoretical literary narratives, the two cultures of the sciences and the

humanities are united, and authors and readers ponder at multiple levels what it means to be human.

As my primary texts are interdisciplinary hybrids, I will refer at length in this thesis to disciplinary cultures and their convergence. C. P. Snow's term, "the 'two cultures'" (2) will be deployed throughout; a term used by the scientist and author in 1959 to lament the lack of coherent interaction and collaboration between those working in the respective fields of the sciences and the humanities. I also refer extensively to what the evolutionary biologist E. O. Wilson termed intellectual 'consilience'. Coined in its modern usage in 1998, the term consilience echoes Snow's ideal of integrating the two cultures. In Wilson's words, the consilient mind desires to unite the best of "the sciences and humanities" (Wilson 6), for the purpose of "understanding the human condition with a higher degree of certainty" (ibid 7). The virtues of consilience will be affirmed throughout this thesis, which seeks to exemplify that modern literature is a complex and interdisciplinary phenomenon, and that "once the literary nature of popular science [and modern origin stories]¹ is recognized, literary analysis of this genre seems not only possible but indispensable" (Leane 5).

The genre of the modern origin story will be defined in detail in chapter one. However, it should be noted that, as with all generic classifications, it is well not to be too prescriptive. Genre has long been perceived, in the main, as a "dynamic" (Devitt 699), rather than static, concept. As such, genre theory is no longer simply geared towards analysing "traditional classes of literary texts," it is also concerned with evolving literary forms and purposes, and takes into account "how people use language to accomplish specific tasks" (Burkholder 2). In the case of the modern origin story, the genre is significant precisely because it exploits age-

¹ The genres of popular science and modern origin stories are conflated here, as texts belonging to the latter simultaneously belong to the umbrella genre of the former. However, as I will exemplify presently, modern origin stories also have a number of distinctive features that are not shared by all works of popular science.

old literary strategies. These strategies are amalgamated and adapted within contemporary non-fiction narratives, which are consumed as literature, and which ultimately fulfil enduring human needs.

The aim of this study will be to consider, following the approach of modern genre theorist Amy J. Devitt, the “situation and function” of modern origin stories “in a social context” (Devitt 698). I seek to chronicle the nature, purpose and value of these narratives, with a view to considering their place in the evolving modern literary climate. Synthesising and refining approaches to literature and genre, as carved out in the twentieth century by Mikhail Bakhtin and Tzvetan Todorov, I will also emphasise in my discussion of modern origin stories, the tendency of literary genres to retain “elements of the *archaic*” whilst undergoing a perpetual process of “*renewal*” (Bakhtin 107). Bakhtin’s conception of genre as “eternally alive” (idem), in an “Einsteinian world” (ibid 272) of uncertainty, complements Todorov’s view that literature cannot be categorically defined as a structural entity; rather, it is a fluid and functional notion, which, like genre, is manifest in terms of “choices among discursive possibilities... that a given society has made conventional” (Todorov 10).

Terry Eagleton seconds this view throughout his seminal volume, *Literary Theory: An Introduction* (1983). He exemplifies how definitions of literature that rely on distinctions between fact and fiction, or that insist that ‘literary’ language must be demarcated from everyday speech, are wholly inadequate. For Eagleton, as for Todorov, “literature cannot in fact be ‘objectively’ defined” (Eagleton 7). As both emphasise, “anything can be literature” (ibid 9), and will be deemed so according to culturally determined value judgements, which invariably change over time. The modern origin story affirms and typifies such conceptions of genre, language and literature. It is a thoroughly intertextual and complex literary hybrid, which, like all genres, “reflects the dominant ideology” (Todorov 19) of the age – in this case,

the ‘ideology’² of modern science.

However, as modern science is not “a single monolithic and unified enterprise” (Kuhn 49), the texts that reflect its worldview(s) are naturally diverse, complex and readily subject to reappraisal. Moreover, the forms in which scientific ideas are expressed are rapidly diversifying and encroaching on domains conventionally associated with literature and the humanities. Through a close study of a number of modern origin stories, I will demonstrate that in the modern era of interdisciplinary communication and storytelling, “the traditional separation of rhetorical and poetic, and even scientific texts, is breaking down” (Bulhof 84). As the interdisciplinary historian of literature and science communication, Charlotte Sleigh writes:

Most of us have given up on the imperious notion that there exists, somewhere in an ivy-clad college, a library full of dusty books that together constitute the Complete Works of Proper Literature. So why do we still sometimes balk at counting genres of science as literature? (9).

Why indeed? Like Sleigh, I maintain that, “coming to grips with science... is arguably the most socially pressing task for the literary critic of today” (201). Ours is an age where popular science books and modern origin stories, from Stephen Hawking’s *A Brief History of Time* (1984) to Lawrence Krauss’ *A Universe from Nothing* (2011), are regularly featured on *New York Times* bestseller lists; an age where the zoologist Richard Dawkins became the first popular science author to receive the Royal Society of Literature Award for *The Blind Watchmaker* (1987), which also won the *Los Angeles Times* Literary Prize. In addition, this is an age where a zoologist like Dawkins can be elected as a fellow of The Royal Society of

² Ideology is used in the broadest sense here and is synonymous with the term ‘worldview.’ As argued throughout, the worldview of modern science is not static or singular, nor is it typically held dogmatically. However, as modern science is being compared with other worldviews and ideologies, the term is appropriate for the sake of comparison. Moreover, it is used to suggest evolutionary continuity among the domains of human knowledge and belief.

Literature, and can question in earnest why, “no scientist has won the Nobel Prize for Literature” (*Edge* 3) and be taken seriously.

Looking beyond the publishing and academic worlds, this is also an age where science practitioners like Krauss and Dawkins can embark on a world tour of epic proportions, as they did in 2012. This tour of lectures, debates, festivals and interviews was filmed and subsequently made into a feature-length documentary and road movie, *The Unbelievers* (2013). The film was directed by, “former musician Gus Holwerda, who wanted to create a movie about science that played like a rock and roll tour video” (*Wired* n. pag.). *The Unbelievers* featured interviews with an array of scientifically literate pop-culture icons, such as Woody Allen, Cameron Diaz, Ricky Gervais, Werner Herzog, Tim Minchin and Cormac McCarthy. In such an age, with these consilient dialogues becoming increasingly commonplace, very serious questions begin to emerge about the extent of the division between the cultures of the sciences and the humanities, as well as the nature and limits of modern literature and storytelling. Through the variegated lens of the genre of the modern origin story, it is possible to explore these questions, and to propel modern literary studies into the fertile *terra nullius* that dwells in the interstices between disciplines.

If the literary critic’s purpose in examining literature is to understand human psychology, culture, communication and expression on both an aesthetic and intellectual level, then modern origin stories meet all of the prerequisites for investigation, and have the added advantage of being a notable and underexplored cultural and publishing phenomenon. Given that “a ‘literary’ reading can be imposed on any text” (Todorov 3), the modern literary critic can certainly engage with hybrid texts such as modern origin stories, particularly as they fall on, and engage with, the historical canon of *belles lettres*, with which they share undeniable kinships.

As the Literary Darwinist Gillian Beer notes, we live in an interdisciplinary world, a global community in which genres consistently interact, co-mingle and transform each other; a world in which scientists and the community at large “share the moment’s discourse” (1996; 171). Such consilient notions have long been espoused: from the poet Matthew Arnold (1882) and the biologist T. H. Huxley’s (1882) public exchanges in the nineteenth century, to the biologist Peter Medawar (1982) and the novelist Aldous Huxley’s (1947; 1963) consilient commentary on the two cultures in the twentieth. However, in the twenty-first century, such interdisciplinary perspectives are becoming more prominent in the academy than they have been in the past. Scholars from a wide range of disciplines are now discussing and engaging in interdisciplinary research³, while the creative and literary facets of scientific research and communication have been chronicled by a growing number of scholars over the past few decades.⁴

A number of extant publications identify some of the major literary strategies employed in popular science texts, whilst many scholars cite and analyse textual examples of fictional literature that has incorporated modern scientific theory.⁵ Such endeavours are a testament to the growing influence and cultural capital of the scientific ethos in modern society. In addition, a plethora of multi-disciplinary anthologies and introductory texts on Science and Literature, and Science Communication, have been published in the past two decades,⁶ while the sub-discipline of Literary Darwinism has flourished and expanded, encompassing the literary-focused endeavours of pioneers such as Gillian Beer (1996; 2009) and George Levine

³ For a diverse range of examples, see: Cronon (1992), Fox-Keller (1995), Wilson (1998), Gibbons et.al (2000), Bowen and Wilson (2001), Lepore (2002), Christian (2004), Hyvärinen (2006), Pinker (2007; 2013), Sleight (2011), Repko (2012), and Slingerland and Collard (2012).

⁴ An increase identified by Gregory and Miller, (2000; 1), Leane (2007; 5, 13-14), and Sleight (2011; 10).

⁵ Notable examples include: Levine (1991; 2011), Carter (1998), Byatt (2005), Danger (2006), Beer (2009), Carbonell (2010), Gill (2013), and Ortega and Vidal (2013).

⁶ See: Bucchi (1998), Martin and Veel (1998), Gibbons et.al. (2000), Gregory and Miller (2000), Stockmayer et.al. (2001), Otis (2002), Irwin and Wynne (2003), Broks (2006), Leane (2007), Holliman et.al (2009), Sleight (2011), and Perrault (2013).

(1991; 2011), as well as the more sociobiological and quantitative literary studies undertaken by Joseph Carroll (2011; 2012) and Jonathan Gottschall (2008; 2013).

In *The Faber Book of Science* (1998), the literary critic John Carey dubbed the growing pool of popular science writing as “a new kind of late twentieth-century literature, which demands to be recognized as a separate genre, distinct from the old literary forms” (xiv). I endeavour to promote such a view throughout this thesis. However, in doing so I will emphasise that modern origin stories are distinct, *but not separate from*, the old literary forms; these provide popular science narratives and modern origin stories with context and orientation amidst the diverse and ever-changing literary landscape.

Like Carey, the modern novelist Ian McEwan maintains that a scientific literary tradition has long been in existence, and should be recognised and nurtured in modern society. McEwan attributes a powerful “aesthetic value” (*The Guardian* 2) to scientific narratives such as Darwin’s *The Origin of Species*, which, he posits, contains “something of the luminous quality of great literature” (idem). In addition, he hails the biologist Richard Dawkins’ debut publication, *The Selfish Gene* (1976), as a book that “stood at the beginning of a golden age of science writing” (idem). Like many modern origin stories, *The Selfish Gene* is a hybrid text, which, as McEwan notes, had a profound effect on the teaching of biology, whilst engaging readers “provocatively, and with style” (4). Aligning Dawkins’ scientific literary achievement with a work of art, he writes: “just as we can sit around the kitchen table and discuss operas, movies or novels without being composers, directors or novelists, so we can engage with this subject”, which, in addition to being a scientific text, constitutes yet another “sublime achievement of accumulated creativity” (idem).

As with every contemporary research field, the horizons of the literary critic are expanding. We are now investigating the literary nature of a broader range of texts, which often fall

outside of more traditional research parameters. In the process we are coming to know literature better: as an evolving means of human communication and expression, as opposed to a static structural entity with an implacable essence. However, it must be noted that among the majority of research that considers the intersections between storytelling, science and society, the focus is rarely, if ever, on broad-scale narratives of origins. Such works have typically been confined to a discussion of the devices employed by writers of (mostly) popular science, and usually conclude with the basic reiteration that narrative aids the communication of specialist theory.⁷

In the attempt to overtly define a growing body of *certain types* of interdisciplinary, science-based narratives as a literary genre in themselves – more specifically, as origin stories – a single publication stands virtually alone. The work in question is the historian David Christian's 2004 interdisciplinary epic, and self-proclaimed modern creation myth, *Maps of Time*. Although the connection between popular science, mythology and origin stories has been tacitly made by authors from a wide range of disciplines over the past few decades, the idea is only now receiving space as a headlining question in its own right.⁸ However, Christian's primary concern is not with genre, but rather with epistemology, pedagogy and with his version of the origin story itself; a narrative framed through the lens of the interdisciplinary field of Big History. My own concern in this thesis is to show that modern origin stories such as *Maps of Time* exemplify that a new space is emerging in modern literature, a space that demands the critic's attention.

By bringing to the fore the symbiotic relationship between science and narrative, I will demonstrate that one of the major avenues where the two cultures of the sciences and the humanities are converging today is in the study of origins. As I will argue, a literary reading

⁷ See: Landau (1984), Lewin (1987), Terrell (1990), Curtis (1994), and Gjedde (1999).

⁸ In addition to *Maps of Time*, see Genet et.al (2009).

of modern origin stories can foster a more considered examination of the relevant and increasingly pervasive phenomenon of intellectual consilience, which is writ large in these narratives. Framing this notable modern literary genre in sharper relief, I will illustrate its complexity and exemplify its manifold literary merits.

In chapter one, I situate the modern origin story within its social and historical context and provide a working set of generic co-ordinates. In so doing, I focus primarily on characteristics that pertain to the theoretical and scientific foundations of the narratives – characteristics that demarcate them from more traditional creation myths. With regards to language and narrative strategy I have not been prescriptive. However, I will stress in chapters two and three how the deft literary composition of a modern origin story is integral to its successful expression of both theory and narrative.

In chapter two, I trace a broad narrative outline of two modern origin stories: Lawrence Krauss' 2011 tale of our cosmological beginnings, *A Universe from Nothing*, and Richard Dawkins' 2004 homologous Chaucerian epic, *The Ancestor's Tale*. Beginning with a discussion of the content, methods and ideological outlooks of these narratives, I exemplify that modern origin stories necessarily engage with, and colour, our perceptions of the literature and metaphysics of the past. The texts under discussion are hybrid literary narratives and they fulfil the same social needs as all human origin stories to date. However, they do so with an understandably unprecedented reliance on modern scientific theory and method, which in turn affects the language and content of the texts, and engenders the complex intertextual structures of the narratives.

In chapter three I focus more comprehensively on the literary strategies and merits of a number of modern origin stories. Beginning with Charles Darwin's *The Origin of Species*, I exemplify how the authors of such narratives incorporate theoretical exposition, poetic

language, rhetoric and analogy, into texts that ultimately embody the trinity of elements prescribed by the novelist Vladimir Nabokov in his recipe for great literature: magic, story and lesson. Combining these three complementary qualities in their writing, Darwin, and his latter-day successors Richard Dawkins and Carl Sagan, tell stories that are simultaneously academic and colloquial, scientific and literary, and persuasive and enchanting. In these modern origin stories, the best elements of the two cultures are united, while the age-old functions of mythology and literature are served in complex modern forms.

Drawing upon the insights compiled in chapters one, two and three, I conclude by affirming that modern origin stories are products of an age of complexity, rapid evolution and disciplinary convergence. From a literary perspective, an analysis of modern origin stories can help us reconsider how we conceptualise narratives, with particular regards to the ever-diminishing divide between the sciences and the humanities; two inexorably evolving cultures, which are “in constant dialogue” (Sleigh 10) in modern society. Emphasising the impact of consilience on modern literature and culture, I hope to have meaningfully analysed an important and elusive genre of modern literature, and to have suggested fertile avenues for further consilient research.

Chapter One

Science, Modernity and the Rise of the Modern Origin Story

Freed from the shackles and inescapable destiny imposed by myth, we nevertheless want to regain one part of what we think myth offered in the past: a coherent cosmic vision that answers questions that we cannot help asking: Who are we? How did we get here? Why? What is to be done?

– Gregory Schrempp, *The Ancient Mythology of Modern Science* (2012)

The modern origin story has its strongest roots in the nineteenth century, begotten, as it was, on the ‘long, withdrawing roar’ of the tides of certainty, teleology and traditionalism. In this age of profound evolution and discovery, “technological advances and transformative new theories... made science as essential to culture as Horace’s poetry had once seemed to be” (Otis xviii). At this time, “science was in effect a variety of literature” (ibid xvii); the lack of specialised scientific discourse in the Victorian age engendered a profound cross-pollination of ideas among the, as yet, embryonic, two cultures. In such a rapidly evolving literary climate, “new genres” proliferated, and “a new exploration of language” (Armstrong 7) was brought to the fore. Thus, alongside the works of the major novelists and poets, scientific origin stories such as Darwin’s *The Origin of Species* were among the bestselling works of Victorian literature; the entire 1,250 copies of the first edition selling out in the first day of release (Bulhof 49).

However, despite its growing cultural capital, and despite the foundational inroads made by earlier scientific researchers and advocates, such as Newton, Kepler, Galileo, Halley and Bacon, modern science was still in its infancy in the nineteenth century, and theological origin stories remained preeminent. By contrast, science is now the dominant⁹ ‘ideology’ of the modern world (Wilson and Bowen 208), and sheds more light with each passing year on

⁹ Dominant in terms of global influence and application.

questions of where we have come from, what we are, and where we are going (Sagan 1994; 30). As Charlotte Sleigh writes; “science is everywhere; it is at the root of much of the global economy and it is arguably our most culturally credible force” (24). Moreover, in addition to its tangible utility, modern science is significantly encroaching on the realms of metaphysics and is now able to “help us answer some of the deepest questions we can ask concerning our own existence, and that of the universe through which we travel” (Christian 2004; 1).

With its contemporary potency as a guiding force in all facets of modern life, modern science is profoundly affecting the contemporary literary landscape. As Ian McEwan stated in a discussion of science, narrative and origins, with the physicists Lawrence Krauss and Brian Greene, and the broadcaster Ira Flatow:

We once relied on priests to tell us the shape and nature and purpose of the cosmos and life itself. It’s been a long, slow story of that undoing. We now have a far more interesting story, and it’s also penetrated our lives... If we think of the novel as an investigation into the human condition, technology and science is now so woven into that condition. You cannot escape it (*NPR* 2013; 15).

Alongside McEwan, many modern novelists are engaging more pervasively with contemporary science in their work. Some do so in order to affirm its value and to explore its multitudinous realms with curiosity, as McEwan does. Others do so in order to grapple with its inescapability, and more ostensibly insidious undertones, as Don DeLillo and Jonathan Franzen do. As Elizabeth Leane notes in *Reading Popular Physics* (2007), the theories of modern physics have had a particularly pervasive influence on modern literary metaphors, as evident in the works not only of the above authors, but in the writings of Tom Stoppard, Margaret Atwood, Vladimir Nabokov, John Fowles, John Barth, John Updike, Kurt Vonnegut and Thomas Pynchon (2).

An avid reader of science, the contemporary novelist Cormac McCarthy has discussed “the mysterious connection between art and science and how that relates to human origins” (*NPR* 2011; 1) with Ira Flatow, Lawrence Krauss and Werner Herzog. In addition, McCarthy has praised and proofed Lawrence Krauss’ biography of the Nobel Prize winning physicist Richard Feynman (ibid 21), and is an active participant at the Santa Fe Institute (ibid 3-4): a non-profit organisation in which eminent scholars engage with modern science and “collaborate across disciplines, merging ideas and principles of many fields... in pursuit of creative insights that improve our world” (*Santa Fe Institute* n. pag.). Such consilient collaborations are becoming increasingly commonplace in the academy and beyond, with authors like McEwan regularly addressing audiences of scientists, and contributing to the multidisciplinary collection of essays in Jonathan Gottschall (literary critic) and David Sloan Wilson’s (biologist) edited volume, *The Literary Animal: Evolution and the Nature of Narrative* (2005).

The unifying force in the modern literary world, as McEwan identifies, is the omnipresence of science and technology in modern society; these are inescapable influences, and are consequently integral to any modern consideration, or rendering of the human condition. In McEwan’s view, “if you’re interested in investigating... the human state as things stand, in the conditions of modernity that we find ourselves in, you cannot do this without taking some regard or a lot of regard for science” (*NPR* 2013; 15). Although many modern authors (Lucy Ellmann among them¹⁰) may not agree with McEwan’s claim, I posit that even an active literary *disengagement* with modern science is an engaged manoeuvre, which is itself shaped by the scientifically influenced conditions of modernity.

¹⁰ In 1998, Ellmann wrote an article in *The Guardian*, in which she lamented the fact that “now it’s considered *normal* for science books to fill the bestseller lists, and for their authors to appear on TV” (in Leane 1).

There are significant historical precedents for such reactions. To cite one example, the nineteenth-century poets John Keats and William Blake lamented what they perceived to be the destruction of the mystical properties of nature, by means of empirical observation and the scientific explication of natural laws (Huxley 1963; 36). However, in declaring their more Romantic preferences and writing in accordance with them, both Keats and Blake produced literary representations of the human condition *in response* to the increasingly scientific world in which humanity then dwelled. Their derision was itself a kind of backhanded engagement, for no writer at any time can escape the influences of society and context.

With scientific preoccupations significantly colouring the landscape of contemporary literature, it is hardly surprising that “the study of popular science as a literary genre is a growing field” (Sleigh 202). The belated recognition of the self-evident fact that “science *is* storytelling, albeit of a special kind” (Eldredge and Tattersall 1) inevitably opens a Pandora’s box of pertinent and under-explored research avenues to the modern literary critic, at a time when we still “lack an effective critical vocabulary for discussing popular science books” (Turney 47). However, as popular science does not exist as a “single, easily defined genre”, but rather, “an area in which many styles and formats co-exist” (idem), it remains the task of the literary critic to flesh out more fully how the modern origin story can be demarcated from other works of popular science. Such studies will be able to enhance our necessarily fluid understanding of literature, genre, language, and form, in an ever-changing modern world.

Defining the modern origin story

As products of an increasingly consilient world, modern origin stories are characteristic of what the literary agent John Brockman has referred to as a ‘third culture’; one that:

Consists of those scientists and other thinkers in the empirical world who, through their work and expository writing, are... rendering visible the deeper meanings of our lives, reflecting who and what we are (1).

Although not necessarily written by scientists, modern origin stories invariably derive their insights and suppositions from the theories of modern science. However, like traditional origin stories, and like popular science texts and other works of literature, modern origin stories are communicated through the “images, models and metaphors that make them real to us” (Sleigh 6). Moreover, while not all modern origin stories are equally comprehensive, they generally seek to identify “connections among... ways of seeing rather than... boundaries between them” (*Big History Project* n. pag.).

As I intend to frame this study of modern origin stories in light of their continuities and discontinuities with their forebears, I will begin by providing a working definition of an origin story. An origin story, or to use David Christian’s term, ‘creation myth,’¹¹ offers “memorable and authoritative accounts of how everything began” (Christian 2004; 2). Origin stories “provide universal coordinates within which people can imagine their own existence and find a role in the larger scheme of things” (idem). Moreover, the description of universal order proffered in an origin story must be able to be put to some use: “it must help solve the problems that need to be solved by each community, whether these be spiritual, psychological, political, or mechanical” (idem).

What then sets the modern origin story apart from its progenitors? Throughout human history, *Homo sapiens* has devised and revised a culturally diverse canon of origin stories, all of which “offered workable maps of reality” (ibid 11). However, today we generally require

¹¹ The terms ‘origin story’ and ‘creation myth’ will be used interchangeably throughout this dissertation. However, the former will be used more pervasively in the modern context and the latter in the traditional. Although mythology is not necessarily synonymous with story, it will be used here in its broadest sense to connote a narrative account of creation.

much more rigorous evidence than our ancestors when making claims about the veracity of a theory or hypothesis. This increased focus on rigour and evidence is the inevitable result of living in a sophisticated (at least by current standards) modern society, in which “intellectual problems from antiquity are being illuminated by insights from the sciences of mind, brain, genes, and evolution” (Pinker 2013; 1).

Just as few people today would dream of attributing the symptoms of manic depression or schizophrenia to ‘an imbalance of the humours,’ it is no longer tenable to deduce, as the Karrau people of southern Australia once did, that a Great Father Spirit awakens a Sun Mother every morning; a spirit who then goes on a literal journey to awaken all of life. In this dreamtime narrative, cause is attributed to intangible and unverified anthropomorphic spirits. Conversely, scientists provide testable and readily verifiable evidence in their accounts of how the sun comes to rise and set each day with no reference to any such entities. The former narrative served a valuable purpose in its native ancestral society and was certainly compiled from observation and induction. However, when viewed through the lens of a modern society, the story of the Karrau people, “suggests that creation is not a single event but has to be constantly repeated” (Christian 19-20), a notion that contradicts the strongest body of existing empirical evidence suggesting that the universe began¹² at a single moment, 13.72 billion years ago; an event we refer to as the Big Bang.

Thus, a key distinction between a traditional creation myth and a modern origin story is that the latter must rely on testable and rigorous scientific evidence for the claims made therein (ibid 21). However, this distinction between the origin stories of the past and the present ultimately springs from a more fundamental congruity; that is, the need for an origin story to have utility. Early human origin stories that relied on deductive reasoning and moralising

¹² I use the term ‘began’ equivocally. The idea of a first cause or ultimate beginning is problematic, as we shall see when delving into Krauss’ work in chapter two. See Hawking and Mlodinow (2010; 83, 129) for a more comprehensive explanation.

parables were effectively incorporated into societies for which they provided structure, authority and frameworks for order. These traits are equally essential to the utility of modern origin stories; the difference is that in a modern, scientifically driven age, reasoning without evidence is unlikely to be accepted by a society at large, particularly when reasoning *with* evidence can so easily debunk spurious claims and lead to solutions of far greater utility. Thus, modern origin stories rely on testable, empirical evidence because this has proved the most reliable means for them to progressively add value to a modern society.

Like their pre-modern forebears, modern origin stories also rely heavily on literary tradition, narrative, metaphor and analogy. As my analysis of the works of Lawrence Krauss, Richard Dawkins, Carl Sagan and Charles Darwin in chapters two and three will show, there is often a strong reliance on characterisation, narrative arcs and a considered and often playful kind of anthropomorphising, in modern origin stories. However, as will be exemplified presently, the authors' approaches to characterisation and narrative are often heavily idiosyncratic and purpose driven, particularly by the goal of explication. This is chiefly because the modern origin story is a hybrid literary genre: it is not strictly academic, yet it bears many of the hallmarks and influences of academic writing. It is also not pure narrative, however, it exploits and incorporates many narrative devices in a novel, and often highly appealing way, as the growing popularity of the genre attests.

It must also be emphasised that no origin story of any kind is free from a degree of cultural or contextual bias. Like all other origin stories, modern origin stories are “provisional” (Christian 11). As David L. Wilson and Zack Bowen write, science is “simply another construct among the multitudes concocted by man since the beginnings of recorded history” (208). However, it should also be emphasised that not all human constructs are created equal. Although it is undeniable that “both literature and science are cultural products, at once expressing and helping to form the cultural matrix from which they emerge” (Hayles 120), it

is reductive and misleading to simply assert, as George Levine does, that “science is a cultural formation *equivalent to any other*” (1991; 3, italics mine). Such a claim strands all forms of knowledge and inquiry in a no-man’s land of meaningless parity, when obvious measures of value and provisional veracity are: repeatable efficacy, utility, and correspondence with natural and physical laws. As Steven Pinker writes:

Though we cannot logically *prove* anything about the physical world, we are entitled to have *confidence* in certain beliefs about it. The application of reason and observation to discover tentative generalizations about the world is what we call science. The progress of science, with its dazzling success at explaining and manipulating the world, shows that knowledge of the universe is possible, albeit always probabilistic and subject to revision. Science is thus a paradigm for how we ought to gain knowledge – not the particular methods or institutions of science but its value system, namely to seek to explain the world, to evaluate candidate explanations objectively, and to be cognizant of the tentativeness and uncertainty of our understanding at any time (2011; 181).

This scientific ethos is intrinsic to modern origin stories, which provide a provisional view of the world and the human condition. These narratives rely on the scientific method, which, as Pinker notes, is “explicitly designed to circumvent the errors and sins to which scientists, being human, are vulnerable (2013; 2). A defining trait of modern origin stories that results from this practice is that they privilege evidence over narrative outcome. Although the authors of modern origin stories typically make a concerted effort to appeal to a mass readership using a plethora of rhetorical and narrative devices, they nevertheless do not tell us the origin stories that we *want* to hear, but rather the origin stories that the available evidence suggests to be true.

To frame the above point in another light, one of the key functions of traditional origin stories, providing consolation, takes on a new and more complex role within the modern origin story. Writers of the latter kind of narrative explicitly dissociate themselves from the

goal of providing consolation for its own sake; that is, offering the kind of consolation that is manufactured without evidence. As Lawrence Krauss affirms:

If we wish to draw philosophical conclusions about our own existence, our significance, and the significance of the universe itself, our conclusions should be based on empirical knowledge. A truly open mind means forcing our imaginations to conform to the evidence of reality, and not vice versa, whether or not we like the implications (139).

Yet in spite of their allegiance to scientific theories that often relegate humanity to a cosmic footnote, the exponents of modern origin stories return to the age-old goal of consolation by defining the wonders of the universe as in themselves consoling, beautiful, poetic, and broadly speaking, spiritual. As Schrempp writes, “it is a near constant of science writing to offer a compensatory vision for the one we are asked to give up” (208).

Exemplifying this near constant in *A Universe from Nothing*, Krauss asserts that the scientific picture of creation “emphasizes the best about what it is to be human – our ability to imagine the vast possibilities of existence and the adventurousness to bravely explore them” (139).

Similarly, in *Unweaving the Rainbow* (1998), Richard Dawkins insists that, “the debunking of cosmic sentimentality must not be confused with a loss of personal hope” (xi). In his writing and oratory, Dawkins repeatedly highlights the absurdity of tying our personal ambitions to the ultimate fate of the cosmos. He maintains that the joy of living is intensified by the wonders of science, which “can give us... a deep aesthetic passion to rank with the finest that music and poetry can deliver” (xii). For Dawkins, science “is truly one of the things that makes life worth living and it does so, if anything, more effectively if it convinces us that the time we have for living is finite” (idem). Thus, in modern origin stories, consolation is typically engendered through the celebration of the human ability for cognition, self-reflexivity, curiosity and exploration. These abilities have yielded epiphanic moments for

individuals, and have also elicited remarkable gains (and, of course, perils) for humanity in aggregate.

Alongside the allegiance to empiricism, a self-proclaimed agenda against ignorance and superstition is typically discernable in a modern origin story. In early creation myths, the truth of the story was often subordinate to the impact the narrative could have on readers and listeners; in many cases an impact that demanded their ignorance and susceptibility to superstition. The propagators of early origin accounts would often seek to fill gaps in human knowledge through convenient (but often startlingly inaccurate) metaphors and parables. Conversely, the proponents of modern origin stories explicitly favour transparency in their exposition; a preference that goes hand in hand with their allegiance to the scientific method.

Of course it would be naïve to imagine the writers of modern origin stories to be infallible; a point they are generally the first to concede. They are also typically the first to acknowledge any gaps in current theory and understanding, and often candidly stress the provisionality of many existing scientific theories. Indeed, in *The Origin of Species*, Darwin frequently alludes to the impossibility of citing comprehensive research data to support his claims, and often acknowledges how readily counter-claims can be made. Rather than providing all of the “copious details” (Darwin 1998; 9) he had collected on various organisms, Darwin elected to present a unifying narrative, which could be read by a broad readership and could be subject to further scrutiny. Thus, Darwin did not simply *do* science; he *used* science to better understand reality, synthesising research and narrative in a text that irrevocably altered the discipline of natural history, as well as the dominant view of man’s place in the universe.

Like Darwin, many authors of modern origin stories are readily excited by theoretical possibilities that could displace all current working theories about where we come from and what we are. In *A Universe From Nothing*, Lawrence Krauss recalls contemplating the

possibility of the existence of dark matter in the 1980's: "Even more exciting, at least for me, this implied three new lines of research that could fundamentally reilluminate the nature of reality" (25). Similarly, Richard Dawkins declares in *The Ancestor's Tale*, "If we now were to discover a life form sufficiently alien to have a completely different genetic code, it would be the most exciting biological discovery in my adult lifetime" (7).

For Krauss, Dawkins and many others, the prize of intellectual inquiry is – to use the phrase of the physicist Richard Feynman, "the pleasure of finding the thing out, the kick in the discovery" (12). The physicist Brian Greene affirms this view, stating of his research compatriots in the hard sciences, "it's the open questions that really drive us" (NPR 2013; 11). Like Feynman and Greene, Krauss, Dawkins and other authors of modern origin stories are driven by the spirit of inquiry and by the appetite to know more about what is true, however startling or counterintuitive their findings. These authors do not care a whit that new and cataclysmic discoveries may erode the fundamental theories that they have based their conceptions of reality upon; they care only that something hitherto unknown can now be explored and that we may have advanced closer to a 'truer' conception of reality than ever before.

Moreover, as the astrophysicist Neil de Grasse Tyson emphasises, gaps in understanding in any modern origin story are never filled by God (*Beyond Belief* n. pag.) – unless of course new evidence were to come to light supporting such a hypothesis. The opposite was true in almost all previous ages. As Tyson reveals, even Newton turned to God precisely at the point where his scientific understanding of the cosmos reached its apparent limits (idem). Yet in the twenty-first century, Lawrence Krauss diverges from Newton's example, imploring his readers not to succumb to a "'God of the Gaps' picture, whereby God is invoked whenever there is something specific about our observations that seems puzzling or not fully understood" (2011; 145). Modern origin stories, then, are non-theological in nature and

overtly aim to maximise value in the present. They use “science and empiricism” to address the “urgent problems pressing us in the 21st century” (Krauss, *NPR* 2013; 16), rather than seeking solace in the idea of the kind of deferred hope and salvation that religion has historically and pervasively offered.

A final qualification is needed. Although we could easily define any contemporary story of human origins that has the faintest utility – such as providing consolation to an individual – as a modern origin story, I am only concerned in this thesis, with rigorously researched non-fiction narratives built upon current scientific theory and empirical analysis. Thus, although L. Ron Hubbard’s extremely popular creation myths are indeed contemporary stories of origins, they are not, for our purposes, a modern origin story. No doubt it would be interesting to compare stylistic similarities and differences between the writings of Hubbard and, say, Carl Sagan or Richard Dawkins. Even more interesting would be to compare the parallel flourishing of narratives of modern science and modern pseudo-science. However, this study will be confined to the working definition of a modern *scientific* origin story; the key, but by no means definitive characteristics of which have been outlined above.

Chapter Two

‘As It Was in the Beginning?’: Tradition and Transformation in *A Universe from Nothing* and *The Ancestor’s Tale*

There is emerging today a coherent story, based on modern, scientific information that tells the history of our universe, from its very beginnings to today. That story can help each one of us understand our place in a larger universe. The evolutionary epic links modern accounts of the origins of the universe, the Earth, life, and human societies into a single story about origins, so it can play in modern society a role similar to that of traditional creation stories in all earlier societies.

– David Christian, “Celebrating the Birth of a New Creation Story” (2009)

The majority of human origin stories are empirical (Schrempp 16); they are based on observation and induction, and constitute an attempt “to grasp reality whole” (Christian 2004; 3). Although most origin stories to date are not scientifically rigorous in the modern sense, they all seek to provide answers to the perennial questions: “Who am I? Where do I belong? What is the totality of which I am a part?” (ibid 1). *A Universe from Nothing* and *The Ancestor’s Tale* are no exception.¹³ Like the scores of human origin stories throughout history, these narratives function as ‘maps of reality’ and provide comprehensible accounts of the human place in the universe according to contemporary scientific evidence.

In effect, both *A Universe From Nothing* and *The Ancestors’ Tale* are two strands of the same story, a tale that begins¹⁴ 13.72 billion years ago, with a bang. In his cosmological origin story, Krauss deploys a scientific argument to suggest, contrary to human intuition and religious reckoning, that, “‘something’ may always come from nothing” (178). Throughout this self-proclaimed “Cosmic Mystery Story” (xi), the author conducts a compelling

¹³ All references to Krauss and Dawkins are taken from *A Universe from Nothing* and *The Ancestor’s Tale* respectively, unless otherwise acknowledged.

¹⁴ I use the term ‘begins’ loosely. Dawkins’ tale is told as a backwards chronology and there are many temporal shifts in the narrative sequences of each tale. Also, see footnote 9.

discussion of the evolution of theoretical physics, the poetic majesty of the cosmos, the unfolding of events that engendered life on earth, and the human desire to answer questions pertaining to our origins. The reader is introduced to a series of historical ‘characters’ – scores of science’s famous and unsung detective heroes – in a series of meta-narratives, asides and anecdotes. As the manifold plots unfold, explanatory theories and the underlying messages of the origin story are conveyed. A true hybrid, Krauss’ narrative is simultaneously theoretical and personal, and earnest and tongue in cheek, and it converges in both content and expression with Dawkins’.

In many ways Dawkins’ narrative picks up where Krauss’ leaves off. The zoologist and evolutionary biologist (who incidentally wrote the Afterword to *A Universe from Nothing*), employs the cosmological origin story as a crucial structural edifice on which to place his narrative of biological evolution. However, the cosmological and the biological narratives, of which those under discussion represent just two of many versions, are not purely sequential. They are fundamentally interdependent and share a complex genealogical kinship, the detailed facets of the one giving credence to the big picture of the other, and vice versa.

Ultimately, both narrative strands coalesce within a more comprehensive cultural origin story: a discursively disseminated and perpetually reconstituted image, made up of a series of interlocking meta-narratives. This fluid, global origin story, dubbed an ‘evolutionary epic’ in the epigraph above, is rarely communicated in the round. However, in its various incarnations, this narrative provides the dominant contemporary frame of reference for reality. I have chosen Krauss’ and Dawkins’ works as case studies for this chapter because they are deftly written, popular scientific origin stories, each composed in the twenty-first century. Alongside scores of others, these narratives have meaningfully contributed to the fluid global map of modern reality, and have in turn imparted historical, philosophical, poetic and scientific insights to modern human beings.

Throughout this chapter, I will primarily exemplify how the messages of the two origin stories are built on modern epistemological foundations. Such foundations demarcate these narratives to a significant extent from their early mythological forebears. However, in defining these texts as prototypical examples of modern origin stories, I will simultaneously affirm that they share undeniable kinships with earlier creation myths. Both kinds of narratives are deeply human pursuits, motivated by common drives and desires, and they are each rendered coherent in literary form. Thus, tradition and transformation are perpetually interacting in these narratives, in which enduring literary tropes, purposes and strategies are deployed and refashioned for modern ends.

A Universe From Nothing

Before we can begin to ponder what we are and where we're going, we must first attempt to answer the question, 'where did we come from?' Foregrounding the perennial quandary of being and nothingness, Krauss deliberately frames his narrative as an alternate, modern, secular *Genesis*. The physicist declares that his aim in writing the book is, "to connect the remarkable discoveries of modern science to a question that has fascinated theologians, philosophers, natural philosophers, and the general public for more than two millennia" (xiii). However, the author clearly states at the outset that he is, "not sympathetic to the conviction that creation requires a creator" (xxi). Although Krauss' narrative is naturally driven by the same existential curiosities as any other origin story, he is adamant that, "the final arbiter of this question [of origins] will not come from hope, desire, revelation, or pure thought. It will come, if it ever does, from an exploration of nature" (142).

Although no origin story, scientific or otherwise, has yet provided an answer as to what the first cause was, Krauss argues that, among other things, science aims to do exactly this, unleashing its legions of 'detective' researchers to scour the universe for more clues to add to

the great cosmic puzzle picture. As with all origin stories, the point of this endeavour is to provide humanity with a compass with which to navigate life and the universe. However, like all contemporary technologies, the ‘compass’ provided by modern science is rapidly being updated, and grows ever more powerful, detailed and accurate. New coordinates persistently enter and enhance our field of vision and the narratives we construct, sailing through uncharted waters, are growing more complex, universal and arresting.

Krauss’ aim is to leverage scientific knowledge in order to answer both age-old and emerging questions, and to facilitate a more enlightened society, using science (to borrow Carl Sagan’s metaphor) as a candle in the dark. As he notes in *A Universe from Nothing*, a profound and recent insight yielded by modern scientific inquiry is that “the metaphysical ‘rule’ ... that ‘*out of nothing nothing comes*,’ has no foundation in science” (174). As recent discoveries in modern physics have revealed, “sometimes conditions are such that real, massive particles can actually pop out of empty space with impunity” (ibid 154). Such a revelation effectively counters the dominant metaphysics of all previous ages.

Unlikely though the proposition of spontaneous apparition may sound, Krauss gives credence to the notion by drawing upon the most contemporary scientific accounts of natural law. He notes that:

Over the past two decades, an exciting series of developments in cosmology, particle theory, and gravitation have completely changed the way we view the universe, with startling and profound implications for our understanding of its origins as well as its future (xxvi).

Expanding on the implications of these developments in a historical meta-narrative and *bildungsroman* of human progress and enlightenment, Krauss goes on to declare that although the whole story is perhaps more complex than we can currently fathom, it is highly plausible

that the universe did indeed spring from something approximate to nothing.¹⁵ Such a notion certainly makes for an arresting narrative beginning.

In effect, Krauss' modern origin story opens with the assertion that 'in the beginning, there was nothing, which exploded.' However, tongue firmly in cheek, the author opts for the opening line; "*It was a dark and stormy night*" (1). Is he setting a sensational scene for the moment of the great cosmic conception? Yes, but in a circumlocutory fashion. The night is an imagined one in 1916, at the time when Albert Einstein was completing the theory of general relativity. Einstein's theory was of profound significance because it suggested, contrary to the consensus at the time, that the universe is not static, but expanding. Such a radical idea was helped into being and common parlance over the course of the twentieth century by a host of other protagonists, such as Georges Lemaître, Henrietta Swan Leavitt and Edwin Hubble. Each of these figures is characterised by Krauss as unflinchingly unconventional, intrepid, and in their way, heroic, according to the now relatively common image of the scientific, intellectual anti-hero, or "transgressor" (Beer 1996; 152).

Krauss' opening manoeuvre, which places the genesis of his modern origin story in the mind of a major human protagonist, Albert Einstein, allows the author to sidestep the sequential problem of beginning a tale in the absence of a clear first cause. Moreover, it allows him to affirm that scientific theory *is* provisional¹⁶ and that this particular view of reality has its *conceptual* origins in the twentieth century. But more importantly, Krauss is acutely cognizant of the importance of engaging his audience, who, being human, naturally demand a degree of 'humanity', or anthropocentrism, in the telling of the narrative in order to remain invested.

¹⁵ In Krauss definition of 'nothing', he means something, containing no matter, but containing the theoretical conditions for it. See pages xxiv, 146 and 153-54 for a more detailed explanation.

¹⁶ Which is not the same as saying it is incorrect, or that it is as good or bad as any other epistemology.

Humanity can be difficult to evoke in a tale that begins billions of years before the inception of life on earth, amidst conditions that a human mind can barely conceive of. Thus, like the authors of origin stories past and present, Krauss relies heavily on metaphor and analogy in order to render his theories coherent. He tempers his philosophically anti-anthropocentric narrative with a series of historical, biographical and anecdotal meta-narratives, which speak of human fears, bravery, missteps and discoveries. In addition, he characterises himself as a maverick; one who writes “heretical paper[s]” (56) and conducts experiments that are “crazy by any standards” (75). Furthermore, he narrates in a humorous and colloquial register, explaining the strangeness of anti-matter through a conversational reflection in which he notes: “it is strange in the sense that Belgians are strange. They are not really strange, it is just that one rarely meets them” (61-62). Exploiting such acts of self-characterisation, Krauss humanises himself to the reader, and, through his frequent analogies and anthropomorphic characterisations, the theoretical exposition that gives credence to his origin story is accessibly conveyed.

In a particularly ingenious passage, Krauss invests a meta-moment of creation – the creation of matter following the big bang – with the drama and prophetic profundity of a Shakespearean love story. Like *Romeo and Juliet*, it is a story that begins with asymmetry. As Shakespeare’s moral (conveyed through Romeo’s early infatuation with Rosaline, and further echoed throughout *The Sonnets*) reveals, a narcissistic love amounts to no matter; it will annihilate itself leaving no progeny. Similarly, in a ‘narcissistic universe’:

No matter or antimatter would be left over to make up stars, or galaxies, or to make up lovers or antilovers who might otherwise one day gaze out and be aroused by the spectacle of the night sky in each other’s arms. No drama. History would consist of emptiness, a radiation bath that would slowly cool, leading ultimately to a cold, dark, bleak universe. Nothingness would reign supreme (Krauss 157).

In this fundamentally consilient passage, Krauss ties humanity to cosmology, framing the asymmetrical cosmic coupling of matter and anti-matter as a momentary triumph of love and life (both of which the event indirectly engendered) over chaos. The conditional ‘hero’, Matter, is framed as a key player in a cosmic drama, engaged in an analogically Darwinian “struggle” (ibid 157) to survive.

The struggle for survival has remained a perennial theme in literature and human origin stories throughout history; however, in the twenty-first century, the theme is rarely framed in simple or tribalistic terms. Abandoning moral absolutism in favour of relativity, Krauss undercuts the black and white hero-villain dichotomy in the passage above, which Shakespeare does to a significant extent in *Romeo and Juliet* also. In the play, the Montagues are no more to blame for the outcome than the Capulets, the Prince, the Friar, the Apothecary, or the Messenger. Circumstances are complex, and essentially deterministic. Likewise, Matter, in Krauss’ scenario, is no better or worse than Anti-Matter, it simply happened to triumph – hence we call it Matter, as we would Anti-Matter had it ‘triumphed’ instead (Krauss 2001; 23-24). Even the symmetrical nullity of ‘Nothingness’ is not the villain here per se, only a possible outcome that is unpalatable to a human mind. Thus, as in all origin stories, the anthropomorphisms in this passage serve the purpose of investing the concept with drama, emotion and pathos. However, in this twenty-first century origin story, traditional literary tropes are glossed with a moral and conceptual complexity, whereby black and white notions of heroism, and human dichotomies of good and evil, are rendered parochial and untenable.

In essence, Krauss’ narrative is a part of (though it simultaneously rails against) the tragic mode of literature. Krauss renders this affinity explicit, writing of the “poetic symmetry” of the scientific view of existence, which reveals that one day the universe will have expanded so far that any observer would be unable to see any evidence of its expansion, a conclusion

Krauss brands as “tragic” (2011; 119). As for the ultimate ending to the cosmological narrative, the parallels with *Romeo and Juliet* hardly need be reasserted. The cosmic coupling of Matter and Anti-Matter ultimately ends in tragedy (from a human perspective at least), with a thermodynamic denouement into cold, empty space. This is perhaps the defining ‘event’ of Krauss’ overarching narrative: a deflating conclusion that is played off against the quasi-defiant, equivocally triumphant, and ultimately humble meta-narratives of human progress, enlightenment and potential.

As we have seen, the working theories of physics and cosmology are remarkably congruent with the themes of much canonical literature. This is not surprising given that science and literature each speak of the same universe, and that the coherence of each endeavour is contingent on the sequential ordering of language through plots, metaphors and analogies. In the conclusions and philosophies of modern origin stories, we can see a clear kinship with the literature of modernism onwards: purpose is questionable, morality is fluid, structure is chaotic and climaxes and denouements are rarely simple or satisfying. Unlike most pre-modern creation myths, *A Universe from Nothing* reminds us at every turn that we are contingent and ephemeral beings, enjoying a brief moment in the sun, in a universe that is not designed with us in mind. The author’s deliberate narrative coupling of anthropomorphic and anthropocentric exposition, with an anti-anthropocentric philosophy, gives voice to the very real physical paradox that humanity is not cosmically privileged, despite having come into being at what appears to be the optimal time to observe the physical universe before it expands enough to separate us from all evidence of our origins (Krauss 123). Thus, in Krauss’ modern origin story, form gives credence to the theories being elucidated, which are complex, non-linear and at times, seemingly paradoxical.

To shift, for a moment, to classicism: perhaps Aristotle bestowed upon tragedy the eponym of the highest form of art in *Poetics* (1997) because he believed on an intuitive level that it

resonated with a broader cosmic truth? The human mind, after all, has a penchant for perceiving itself in nature's reflection. Nevertheless, Aristotle did not have the same tools at his disposal as Krauss and his compatriots for making deductions about the universe. Relying on logic alone, he circumvented the problem of the first cause in his reasoning by concluding that the universe must be eternal (Krauss 172-173). Yet as Krauss asserts, "neither Aristotle nor Aquinas knew about the existence of our galaxy, much less the Big Bang or quantum mechanics." As such, "the issues they and later medieval philosophers grappled with must be interpreted and understood in light of new knowledge" (173). Such a revaluation is precisely what Krauss sets out to achieve in *A Universe from Nothing*, in which he explains contemporary science in the hope that it will inform modern perspectives of the past and present. In the process, he affirms Bakhtin's and Todorov's assertion that new genres inevitably interact with, and reshape the old.

Throughout his modern origin story, Krauss successfully imparts a series of counterintuitive concepts to scores of human minds that have evolved to survive in the African savannah, and not to comprehend things that are infinitesimally small, or inconceivably large. Although many readers may struggle to understand the math behind the predicted heat death of the universe, we can understand the basic premise of the concept through expressions like "the heavens will become cold and empty" (ibid 179). In canonical literature, such images predate the second law of thermodynamics, and are notably brought to the fore in Lord Byron's apocalyptic poem "Darkness" (1816). Engaging with, and undercutting, religious imagery, Byron depicts the universe as a barren place without salvation; a world comprised of "a mass of holy things / For an unholy usage." As if pre-empting the second law, he writes of the sun being extinguish'd" while "the stars / Did wander darkling in the eternal space" (n. pag.). Echoing this literary precedent, which has a complex genealogy of its own, Krauss plays on apocalyptic themes and images in his modern origin story. Like Byron, he co-opts and

appropriates religious language – a strategy that is rife among modern origin stories, as it is in canonical literature. Krauss’ use of such language and imagery serves to emphasise the intrinsic hybridity of the genre, which exists to explicate scientific theories in a persuasive, accessible and ultimately literary manner.

At this juncture it is clear that the overarching questions of origin stories from time immemorial remain consistent. However, it is also decidedly evident that the language, detail, conceptual frameworks, and specific questions that have defined origin stories throughout the ages have changed radically over time. Salient questions within Krauss’ modern origin story include:

Why are there three generations of elementary particles – the electron, and its heavier cousins the muon and tauon, for example, or the three different sets of quarks, of which the lowest energy set makes up the bulk of matter we find on Earth? Why is gravity so much weaker than the other forces in nature, such as electromagnetism? Why is the proton 2,000 times heavier than the electron? (136).

We have come a long way from ‘why does the sun rise in the morning?’ This is not surprising: the language and concerns of literature have always been in flux. We no longer communicate in Latin, or Old English, or write about the world as if it were flat. As Aldous Huxley recognised in the twentieth-century, we are living in an age where: “To the age-old answers, theological, metaphysical and palaeo-physiological, twentieth-century science has added answers of a different kind” (1963; 87). Indeed, “the basic postulates of thought have been changed so that what to our fathers seemed obviously true and important strikes us as either false or negligible and beside the point” (Huxley 1947; 24).

The nature of modern origin stories certainly highlights such divides between past and present worldviews. The rising prominence of this literary genre, and the complex and hybrid nature of its form and content are directly reflective of evolutions in the aesthetics, expectations and

demands of modern literature. In turn, such works of contemporary literature serve to exemplify concurrent transvaluations of modern values and beliefs. However, it must be emphasised that an evolution requires a former state from which to evolve, and it is from early mythology and literature that these narratives derive a significant portion of their DNA.

As science and technology continually alter and refine our visions of reality, the ways that we narrativise origins and essence will naturally continue to evolve. Although many humans once believed they were made by, and in the image of the Gods, we now more commonly suppose that we are, amongst other things, “descended from a hairy quadruped, furnished with a tail and pointed ears, probably arboreal in its habits” (Darwin 2013; 635). The descent of man is the primary subject of the following origin story, in which Richard Dawkins relays a biologically framed, but thoroughly interdisciplinary account of where we come from and what we are.

The Ancestor's Tale

If we trace our lineage far enough into the past – a good hundred and eighty five million generations – we humans will all find that, “our direct ancestors were fish” (Dawkins 318). Such are the remarkable, awe-inspiring and counterintuitive facts that Richard Dawkins illuminates in *The Ancestor's Tale*; an epic literary saga of biological kinship and Darwinian continuity. This genetically driven narrative is relayed through a series of what the author terms ‘rendezvous’; meta-narratives, like those in Chaucer’s *The Canterbury Tales*, which are compiled within an overarching modern origin story: “an epic pilgrimage from the present to the past,” in which “all roads lead to the origin of life” (ibid 9).

Linking form to function and ideology, Dawkins achieves something thoroughly modern in this backwards pilgrimage. Eschewing tribalism, speciesism and the related metaphysics that have dominated throughout human history, the biologist emphasises the gradual and unifying

nature of Darwinian continuity. To borrow Douglas Adams' expression, he extols 'the fundamental interconnectedness of all things', or rather, all species. As Dawkins writes, "even apparently discontinuous modern species like sheep and dogs are linked, via their common ancestor, in unbroken lines of smooth continuity" (ibid 317). Such a portrait of evolution necessarily undercuts ideas of innate essence and privilege, effectively countering the Biblical assertion that God gave man dominion over "every creeping thing that creepeth on earth" (Genesis 1:26). Throughout *The Ancestor's Tale*, Dawkins both engages with and denounces this anthropocentric view of nature, supplanting it with a more cautious modern vision that demands humility from humanity.

Like most traditional and theological origin stories, *The Ancestor's Tale* imparts many lessons to the reader. A major moral of Dawkins' narrative is that "biological evolution has no privileged line of descent and no designated end" (4). For Dawkins, the idea that evolution culminates in a human climax is a misguided human conceit, much like the notion that the universe is geocentric. As he exemplifies, the human strand is just one of innumerable possible evolutionary paths that lead us back to 'Canterbury.'¹⁷ Hence, "we could [just as] easily have begun our pilgrimage with a modern dugong, or a modern blackbird" (371). The author emphasises that he only chose humanity as a starting point for his narrative because human readers are naturally more curious about their own specific line of descent. No privilege is implied in this, merely curiosity. Such a philosophy is affirmed by the narrative's structure. As Dawkins writes, "go backwards and, no matter where you start, you end up celebrating the unity of life" (6).

Like Krauss' modern origin story, Dawkins' narrative is global in scope and unites the whole of the natural world in a tale of humble beginnings, familial kinship and indeterminate ends. Humorous, colloquial, academic and scientific, *The Ancestor's Tale* is a quest narrative, a

¹⁷ Dawkins' Chaucerian term for the common ancestor of all life.

detective story, a family history and an origin story simultaneously. The author exploits, with consummate skill, the language and literary techniques that makes each of these genres successful in its own right. Then, as befits the complexity of a modern origin story, he combines them, channelling the formal virtues of each into a narrative that effectively conveys modern scientific ideas.

As Charlotte Sleigh writes of *The Ancestor's Tale*, the book is “an explicit attempt to reconnect science with its motivating quest for myth” (7). Honing in on the hybrid nature of the text and reflecting on many of the discernible characteristics of the modern origin story (*sans* the generic framework and terminology) Sleigh notes that, “although non-fictional in essence, *The Ancestor's Tale* is written as a series of stories,” with the aim of evoking “the reader’s personal sense of wonder and connection with... their own forbears” (idem). This connection with the past operates at multiple levels in the text: the author emphasises our biological and genetic connections with our multitudinous ancestors, and also implicitly acknowledges a philosophical connection with the omnipresent human urges that engendered earlier metaphysical philosophies. In so doing, Dawkins, like Krauss, exemplifies Bakhtin’s and Todorov’s notion that new genres are perpetually interacting with, drawing from, and reframing the old, forcing traditional worldviews and expressions “to better perceive their own possibilities and boundaries...[and to] overcome their own *naïveté*” (Bakhtin 271).

Notably, many of Dawkins’ rhetorical manoeuvres are prototypically Darwinian, a fact that will be explored more fully in chapter three. As Gillian Beer writes, Darwin “rearranges the elements of creation myths” (2009; 7) taking up the familiar tropes of transformation and kinship, whilst retaining in modern form, “the idea of the ‘single progenitor’” (idem). He does so, as George Levine affirms, in order to tell “the story of our world as a kind of secular myth” (2011; 25). In a similar vein, Dawkins repeatedly co-opts Biblical language and modernises mythological tropes in *The Ancestor's Tale*. Like Krauss, who writes of “the holy

grail of cosmology” (37), Dawkins frequently refers to “the Noah species, the one percent from which we later animals are all descended” (259). Moreover, he jestingly protests, “Darwin forbend!” (609) at the idea that humanity is the summit, or goal of evolution. In a similar fashion, he proclaims in *The Devil’s Chaplain* that, “Africa is Eden to us all” (275).

Dawkins has commented on his use of religious language in an interview with Christopher Brodie, stating that he sometimes deploys “the imagery of religion because it’s part of our culture and because you can’t understand literature without it” (n. pag.). Incorporating religious metaphors into a text that is simultaneously scientific and literary, Dawkins’ narrative, like Krauss’, is subject to the common paradox inherent in popular science writing and modern origin stories, “that narrative implies teleology, even when its argument denies it” (Beer 1996; 165). However, both authors are open about this and use the apparent paradox to further their literary ends. They deftly harness the communicative power of culturally entrenched literary tropes, which are refashioned in order to convincingly convey ideas that defy purposive cosmic design.

In his characterisation of genes in *The Ancestor’s Tale*, Dawkins launches into a fully-fledged anthropomorphic meta-narrative (see italicised phrases), whereby he coaxes the reader gently into the world of the very small and the counterintuitive. This world is rendered intelligible through literary language and analogically human examples:

When taking ‘votes’ from genes, therefore, we have to remember that the nearer a pair of genes are to each other on a chromosome, the more likely they are to experience the same history. And this *motivates* genes which are *close colleagues* to *back up each other’s vote*. At the extreme are sections of DNA so tightly bound together that the entire chunk has *travelled through history* as a single unit. Such *fellow-travelling chunks* are known as ‘hapolytes’, a word that we shall meet again. Among such *caucuses* within the *genetic parliament*, two stand out... Both hold *sexist views* (54).

Compelling though the language of this meta-narrative is, our gene protagonists are not conscious; they cannot and do not plan. It is only from a human perspective that they ‘act’ as if they do. As such, it seems necessary to write about them as if they are rational actors, whilst reading into such passages the implicit caveat that we know they are not; a caveat that Dawkins takes pains to make explicit throughout the text.

In many ways Dawkins is at an advantage as a writer of modern origin stories over some of his non-biologist compatriots. As he remarks, “biology, unlike human history or even physics, already has its grand unifying theory, accepted by all informed practitioners” (1). Whereas evolutionary biology came into its own in the nineteenth century, a field like genetics only began to flourish around the nineteen sixties. Nevertheless, Dawkins must still contend with the “varying versions and interpretations” (idem) of evolutionary theory, many of which are apt to be misleading. In a notable instance of seconding his late colleague Stephen Jay Gould, Dawkins points with a critical eye at the “dominant icon of evolution in popular mythology... [as] a shambling file of simian ancestors, rising progressively in the wake of the erect, striding, majestic figure of *Homo sapiens sapiens*” (1-2). Implicit in this image is the idea of man “as what the whole enterprise is pointing towards; man as a magnet, drawing evolution from the past towards his eminence” (2).

Throughout *The Ancestor's Tale*, Dawkins repeatedly counters such extant narratives of biological evolution. In so doing, he is not only engaging with, and subverting, pre-scientific traditions and values, but also contemporary scientific myths. Like any literary critic, Dawkins is acutely aware of the power of language to distort nature and to construct and encode subjective realities. In an attempt to mitigate the potential for misrepresentation in *The Ancestor's Tale*, he thus correctively inverts the prototypical sequence of a pilgrimage or quest, so that his tale is chronologically regressive (tellingly, Dawkins’ alternative title for *The Ancestor's Tale* was the Bunyanian *Pilgrim's Regress*). The author then deftly reinstates

progression at the level of acquired human knowledge and insight; as we pilgrim readers get closer to ‘Canterbury’, we get closer to the grail that is the partial knowledge of our origins. Thus, although told backwards, the pilgrim reader moves forwards, en route to uncovering a great mystery. As Dawkins wrote in the Preface to First Edition of *The Selfish Gene* (1976), “I have long felt that biology ought to seem as exciting as a mystery story, for a mystery story is exactly what biology is” (xxi). Such a sentiment is ultimately affirmed in *The Ancestor’s Tale*, in which the reader is furnished with a mystery that is at once abstract, and deeply personal.

Like *A Universe from Nothing*, Dawkins’ narrative provides the reader with one of the definitive functions of a creation myth: “an expression of man’s cosmic orientation” (Long 18). Like the authors of all origin stories, Krauss and Dawkins engage heavily with traditional ideas and literary tropes, which are modernised and reframed for the age-old ends of enlightenment, diversion and consolation. Synthesising literary communication and theoretical exposition, they simultaneously engage with, and transform, traditional metaphysics and generic expectations. In short, Krauss and Dawkins provide their readers with an unfinished, but perpetually updated¹⁸ guide to life, the universe and everything. Yet in contrast to the proponents of earlier origin stories, they achieve this by way of narratives built upon the novel foundations of modern scientific theory and method.

¹⁸ The publications themselves are not updated, except with the release of new editions. However, these narratives are merely versions within a nexus of cultural accounts that are themselves constantly revised.

Chapter Three

‘Magic, Story, Lesson’: Literary Persuasion, Generic Hybridity and the Convergence of the Two Cultures in Modern Origin Stories

The idea that science 'divorces itself from literature' arose from sheer ignorance, protested the physicist John Tyndall in 1874. Anyone who read the works of successful scientists could see immediately that most good scientists were also imaginative writers. The ability to express oneself articulately was essential for the communication and progress of science.

– Laura Otis, *Literature and Science in the Nineteenth Century* (2002)

In his essay “Literature and Science” (1882), the Victorian poet Matthew Arnold conceded to the biologist T. H. Huxley that scientific knowledge is important, and that it may come to significantly shape modern perceptions of the universe. However, flirting with consilience only to shy away from its realisation, Arnold maintained that men of science will only ever be able to provide *pure knowledge*: “knowledge not put for us into relation with our sense for conduct, our sense for beauty, and touched with emotion by so being put” (1444). Among the scores of consummate modern scientific storytellers, Lawrence Krauss and Richard Dawkins are living proof to the contrary. So too were a number of Arnold’s contemporaries, including Charles Darwin, and Huxley himself, both of whom were major Victorian literary figures, and whose narrative and rhetorical abilities are undeniable.

As we have seen thus far, modern origin stories are complex generic hybrids in which the scientific and the literary coalesce for complementary ends. From a close reading of any modern origin story it is readily apparent that clarity of expression, a relatable and engaging sense of purpose, authorial self-characterisation, and the exploitation of rousing and inspirational analogies are paramount to the successful communication of empirical subject matter. In these narratives, the content extends far beyond the realms of the scientific and the

academic, co-mingling with the moral, the mythic and the poetic. As I shall demonstrate throughout this chapter, the literary strategies employed in many modern origin stories have much in common with the ideals of the twentieth-century novelist Vladimir Nabokov, who asserted that the boundary-line between science and literature “is not as clear as is generally believed” (3). For Nabokov, all writing, whether fiction or non-fiction, should appeal to the complementary artistic and scientific proclivities of the human mind (4-5), eliciting “a pleasure which is both sensual and intellectual” (6). A great writer, in Nabokov’s view, is a “storyteller, teacher, [and] enchanter” (5) simultaneously, and they engage their readers by combining the three facets of great literature in their work: “magic, story, [and] lesson” (6).

As it stands, we have considered the enduring social and metaphysical purposes, and the distinctly modern philosophies and methods that define modern origin stories as both continuous and discontinuous with their traditional forbears. The literary properties of *A Universe from Nothing* and *The Ancestor’s Tale* have been reflected upon concurrently, in terms of how the writing and framing of the narratives aid their broader rhetorical functions. Engaging in a closer examination of the hybrid literary dynamics of a number of other modern origin stories, we will now consider in detail how the authors of these narratives successfully appeal to readers on an aesthetic and intellectual level simultaneously. As I will affirm, the aesthetics of these works are complex to a degree befitting the modern age, but they are no less literary for being so. The literary and rhetorical properties of modern origin stories are so profoundly intertwined as to be, in essence, inseparable.

There is perhaps no greater epitome of the modern origin story than Charles Darwin’s elusive and paradigmatic *The Origin of Species*. Accordingly, I will begin by analysing this text before tracing the kinships that exist between Darwin’s nineteenth century prototype and more contemporary modern origin stories. Like all texts belonging to this genre, *The Origin* is an elusive hybrid, at once scientific and literary. In her close reading of the text, the literary

critic Isle N. Bulhof notes that Darwin's narrative has "something in common with all genres" (127). She classifies the work as a "myth of creation" (92) and simultaneously deems it part "science" and part "detective story" (12), as well as a rhetorical work designed to persuade readers of the veracity of a particular worldview (18). Throughout her analysis, Bulhof draws our attention to the under-emphasised fact that Darwin's success as a science communicator rests in part on his ability to render complex ideas both familiar and accessible, using "the evocative language of literature" (72). In light of her exemplification of the generic fluidity of the text, she then posits that "we may have to revise our ideas as to what 'science' and 'literature' really are" (4-5), for the pursuits are ostensibly interdependent in *The Origin*, and cannot be readily separated, or polarised.

The complex and hybrid nature of Darwin's origin story has been observed by a number of other literary critics, who have discussed the diverse literary influences and dual emphases on tradition and transformation in the narrative. As we shall see, inspired by Milton's rewriting of *Genesis* (Otis xxiv), Darwin created his own contemporary account of creation that broke with theological precedent (Beer 2009; 12). His theories have since "reshaped the Western imagination" (Levine 1991; 1) and have been manifest in countless forms and fragments. As Beer notes: "during the past hundred years or so evolutionary theory has functioned in our culture like a myth" and has infiltrated the modern consciousness on a number of levels, "feeding an extraordinary range of disciplines beyond its own biological field" (2009; 13). However, as I will emphasise, it is not only evolutionary theory at large that is generically discursive. Darwin's published modern origin story exemplifies, in and of itself, that a purposive work of science can have broader social, rhetorical, mythic and literary functions.

It is clear from the first pages of the heavily autobiographical introduction to *The Origin* that the author will be "present as a story-teller" (Bulhof 116) throughout. Yet it must be emphasised that Darwin's storytelling in *The Origin* is of a complex kind. He writes in the

first person singular and in a style “characterised by rapid movements between description, myth, hypothesis, and homology” (Beer 2009; 95). Moreover, he narrates in a humble tenor that prevails throughout the text; a tone in which personal curiosity and scientific objectivity coalesce. An academic author as much as a storyteller, Darwin is unrelentingly cautious in his choice of expository language when discussing the theory of natural selection and the evidence that he cites in support of it. However, in bringing to life the ‘character’ of the surprising and elusive natural world, in a narrative that is not only scientific, but also philosophical, historical and literary, Darwin’s language frequently becomes elevated, personal, curious and passionate. Indeed, his expression often vacillates mellifluously between rational objectivity and conversational musing and rhetoric.

In the excerpt below, the hybrid literary nature of Darwin’s modern origin story is pronounced. The author states in the academic opening to the chapter that he is about to elucidate, “how the struggle for existence bears on Natural Selection” (48). Yet this elucidation is not achieved through the formulaic presentation of facts, but rather, through a series of conversational musings on existing research. These abstract musings are rendered cogent in literary form, and are explored as conceptual possibilities through metaphor and analogy. Reflecting upon organic diversity and marveling at the complex relationships between species, Darwin queries:

How have all those exquisite adaptations... been perfected? We see these beautiful co-adaptations most plainly in the woodpecker and mistletoe; and only a little less plainly in the humblest parasite which clings to the hairs of a quadruped or feathers of a bird; in the structure of a beetle which dives through water; in the plumed seed which is wafted by the gentlest breeze; in short, we see beautiful adaptations everywhere and in every part of the organic world (49).

In these lines, the author poses a pertinent research question, which is extended through literary vignettes, and coloured by his imagery, anthropomorphic characterisations, and

language of personal reverence. The imaginative component of his logic-based methodology is mirrored by the “literary *poetic*” style and “searching language” (Bulhof 127) of his writing; a language that reflects the unfinished process of intellectual discovery he was undergoing whilst carving out his hypotheses in literary form.

In the passage above, and in *The Origin* at large, we can see the unmistakable hallmarks of magic, story and lesson. No vignette is brought to individual narrative fruition, yet the overarching literary themes of co-operation and kinship are coherently conveyed in these fragments; themes that in turn frame the structure, and enforce the message, of the narrative at large. Although *The Origin* is a heavily theoretical narrative, it is also redolent with literary flair, and social and metaphysical implications, which in turn elicit the spine-tingling profundity of Nabokov’s literary ‘magic’. Whether or not we agree that the natural world has majesty, the author’s reverent language conveys *his* unmistakable feeling in favour of this sentiment. And as the naturalist’s conversational persona is omnipresent throughout the text, we engage not only with the content of the work, but with the author-protagonist’s self-characterisation; one of the many complementary means that Darwin employs to delight, inform and persuade his readers.

A pioneering author of modern origin stories, Darwin is also a consummate purveyor of the literature of gentle persuasion. Though his research is extensive and his factual evidence compelling, the naturalist “was well aware that a simple statement of the facts is not sufficient to convince listeners or readers of a particular point of view” (Bulhof 59). As Laura Otis affirms, Darwin “knew that he could never be persuasive unless he could make readers see what he saw” (xxii). Thus, throughout *The Origin*, the author makes extensive “use of metaphors and personifications” (Bulhof 55), which he deploys in order to “enable his readers to interpret unfamiliar nature” (ibid 72).

A particularly significant analogy in *The Origin* is the one Darwin draws between the familiar Victorian phenomenon of domestic breeding, and the then unfamiliar concept of natural selection. In a series of allusions and asides, Darwin compares nature's unconscious 'work' to the human breeder, who deliberately selects in his stock "some modification prominent enough to catch his eye, or to be plainly useful to him" (66). In his analogic representation, nature is idealised as an enduring force, more powerful than man and capable of producing "far higher workmanship" (idem); all without being subject to the ephemerality of the human lifespan. In a poetic and melodramatic vein Darwin laments, "How fleeting are the wishes and efforts of man! How short his time!" (66). In the face of this lament, Darwin, like the authors of every human origin story, looks to a higher power for answers and consolation. However, his consolation is not derived from a belief in a sentient higher power or an ultimate purpose for mankind. Rather, it is derived from his belief that reality can be better understood through a scientific explanation, which shows that complexity can arise "from so simple a beginning" (369), and that a world once thought to bear the indelible stamp of design could have developed "silently and insensibly" (66).

As in *A Universe from Nothing* and *The Ancestor's Tale*, the literary paradox of teleology comes in to play in Darwin's scientific creation myth. Anthropomorphising nature, he writes:

It may be said that natural selection is daily and hourly scrutinising, throughout the world, every variation, even the slightest; rejecting that which is bad, preserving, and adding up all that is good; silently and insensibly working, whenever and wherever opportunity offers (idem).

Although we now know that the primary unit of selection is the gene and not the organism, the main point to consider in this passage is that Darwin did not mean to imply that nature is a sentient force or a rational actor. His anthropomorphisms and rhetorical flourishes allow him to characterise the 'actions' and effects of natural selection, which he explicitly states, works 'insensibly.' Through such analogies, Darwin tells tales within tales, which together blur the

generic boundaries between non-fiction, narrative and fiction (Levine 1991; 2). He thus renders the strange familiar, and is able to “tempt his readers to enter a new world” (Bulhof 20).

As Darwin discovered in his lifetime, the key to being a successful writer of any subject is to be a deft communicator. Moreover, in order to have the widest possible impact, the writer must appeal to diverse audiences and render their content accessible to lay-people. It is telling that both Darwin’s, and his contemporary, Alfred Russel Wallace’s 1859 presentations on natural selection and evolution, were not considered remotely significant by their academic peers at the Linnaean society. Indeed, the chairman noted in his annual report that the year had not “been marked by any of those striking discoveries which at once revolutionize the department of science on which they bear” (in Bulhof 19). Yet the success of *The Origin of Species*, published that same year, and written on the same subject, was profound. With the book’s release, Darwin’s theory of evolution by natural selection created an “immediate sensation” (idem) and concurrently engendered “a scientific revolution” (ibid 20), significantly altering the dominant view of man’s place in the natural world. As Bulhof suggests, this is largely because of the literary appeal and rhetorically persuasive and engaging nature of the narrative (125).

In his framing of *The Origin*, Darwin simultaneously appeals to what Matthew Arnold termed the human ‘sense for beauty’ and the complementary ‘sense for conduct’. Throughout the narrative, he presents theories and facts, the value of which reside in their capacity to enlighten. However, he concurrently paints a literary likeness of the character of nature, which is “prodigal in variety, though niggard in innovation” (355). A protagonist with God-like powers, “She can act on every internal organ, on every shade of constitutional difference, on the whole machinery of life” (65). Like all origin stories, Darwin’s universal portrait of nature speaks to the origin and essence of man. And as with most origin stories, both

traditional and modern, it frequently evokes the spine-tingling feeling of awe and profundity that is similarly conjured by other expressions of weighty and universal subject matter.

Consider the famous closing remarks of Darwin's infamous origin story:

There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one... whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved (369).

In these lines, Darwin extols the beauty of nature, and affirms the value of understanding the laws that govern it. In addition, he refers to the theories in *The Origin* as constituting a 'view of life', which of course they do. This view is as profound and all encompassing as that of any origin story and has "something of the ancient fable" (Bulhof 96) about it. Indeed, Darwin suggests, without preaching, "a kind of morality" based on scientific "consolation and reconciliation" (idem). By calling into question the dominant Victorian view of reality, Darwin's origin story necessarily influenced human self-perception, morality, society and conduct. For this reason, *The Origin* should certainly have appeased Darwin's contemporary Matthew Arnold; more so for there is more than a hint of emotion in the telling.

Of course Arnold was not anti-science and publically praised Darwin's work as a highly "interesting" (1443) contribution to human knowledge. The poet also declared that "all knowledge that reaches us through books is literature" (1440) and counted Euclid's *Elements* and Newton's *Principia* among the literary ranks. Yet Arnold struggled with the possibility that the rise of scientific education might oust many valuable and humanistic aspects of a classical education. Although he ostensibly longed for a union of the two cultures, he nevertheless affirmed separatism in his rhetoric, hoping that in a scientific age, the humanities would retain their currency by providing a bridge between the realms of science, conduct and

beauty. His mistake was to believe that men of letters belonged to a different sphere than men of science, and that they were any more or less capable of injecting humanity, philosophy, poetry and values into their musings on the nature of reality.

In his scientific origin story, Darwin frequently evokes and displays quasi-poetic feelings of grandeur and exaltation. He counters the timeless human lament over earth bound ephemerality with an imaginative theoretical leap; one that enabled human beings to better understand their origins, while also prompting us to take “a prophetic glance into futurity” (Darwin 1998; 368). Darwin’s Romantic poet contemporaries achieved the same feat by differing (but not innately superior) literary means, similarly harnessing the incalculable potential of the human imagination. Of course Darwin was not a poet, nor was his writing poetic in the generic sense; however, his linguistic elevation of the details of a reality sometimes perceived as banal, “cast a spell” (Bulhof 127) on his readers, engendering a similar, if not identical emotional response to that often elicited by poetry, or the contemplation of aesthetic beauty.

By appealing both aesthetically and intellectually to the human appetite for profundity and beauty, Darwin showcases a timeless function of literature in *The Origin*. At its best, literature has provided humanity with a compass; a generic, and a personal sense of orientation based on a rendering of universal themes. From Horace, to the Augustans, to the writers of the present, the dual functions of literature – to delight and instruct – have remained steadfast. These functions are as intrinsic to modern origin stories as they are to any other work of literature.

Like Darwin, the contemporary biologist and author Richard Dawkins exploits the best of the two cultures in his modern origin stories, in which he writes at length of the poetry of science. In his rousing non-fiction narratives, designed to elicit what Nabokov termed “the telltale

tingle” (6) of aesthetic and intellectual recognition down the spine of the reader, Dawkins consistently appeals to the human “appetite for wonder” (Dawkins 2006; 114). He qualifies this objective in his explanation of the title of his 2011 book *The Magic of Reality*, in which he posits that the wonders and mysteries of nature as revealed through science, are the most arresting, poetic, profound and inexhaustible subjects for literary reflection:

The third meaning of magic is the one I mean in my title: poetic magic. We are moved to tears by a beautiful piece of music and we describe the performance as ‘magical’. We gaze up at the stars of a dark night with no moon and no city lights and, breathless with joy, we say the sight is ‘pure magic’... In this sense ‘magical’ simply means deeply moving, exhilarating: something that gives us goose bumps, something that makes us feel more fully alive. What I hope to show you in this book is that reality – the facts of the real world as understood through the methods of science – is magical in this third sense, the poetic sense, the good to be alive sense (21).

Like Dawkins, Lawrence Krauss aligns science and poeticism in *A Universe from Nothing*, remarking:

One of the most poetic facts I know about the universe is that essentially every atom in your body was once inside a star that exploded. Moreover, the atoms in your left hand probably came from a different star than did those in your right. We are all, literally, star children, and our bodies made of stardust (2011; 17).

Such philosophical and poetic reflections are to be found in most popular science texts and modern origin stories. Such narratives, after all, are constructed for the expressed purpose of contemplating the grandeur and complexity of the universe. But as Aldous Huxley notes:

The ability to have poetical impressions is common. The ability to give poetical expression to poetical impressions is very rare. Most of us can feel in a Keatsian way, but almost none of us can write in a Keatsian way (34).

Of course the measure of literary aptitude is not defined by how Keatsian one can be. But Huxley's point is that literature gives voice to what human beings perceive to be ineffable and it has the power to evoke an aesthetic and emotional (poetic) response in others. What Richard Dawkins and others demonstrate – as Huxley did also – is that such 'poetic' expressions do not have to be composed at the expense of veracity. Richard Feynman adamantly supported this view, decrying the idea that a flower was any less beautiful to him because he could understand its structure and mechanisms (Feynman 2). In a similar vein, Carl Sagan eloquently declared in *The Pale Blue Dot* (1994), "it does no harm to the romance of the sunset to know a little bit about it" (160).

In *Unweaving the Rainbow*, Dawkins posits that the mystic poet and the man of science are each inspired by the same human "impulses to awe, reverence and wonder" (17). Both are driven by the pursuit of deep and aesthetically rousing knowledge and understanding. Emphasising the same moral of kinship that is prevalent throughout *The Ancestor's Tale*, Dawkins endeavours to hope that poets will incorporate the beauty of a scientific worldview more fully into their reflections on life, nature and reality. Simultaneously, he rallies the scientist to reclaim "that style of awed wonder that moved mystics like Blake" (18). In Dawkins' view, the nature of reality is both wondrous and awe-inspiring on an intrinsic level; "the poetry is in the science" (18). Yet a human mind is still required to tease out nature's poetic potential to the full, and this, as Dawkins recognises, requires literary facility.

Well versed in literature and poetry, one of the most remarkable things about Dawkins as a writer is his sensitivity to poetic expression and his unceasing consciousness of the audience for whom he is writing. A literary strategy that Dawkins deploys frequently is rousing a "reader's imagination with a stunning fact, or a fresh metaphor" with the aim of "turning a familiar fact dizzyingly upside down" (*Edge* n. pag.). In *The Magic of Reality*, Dawkins devises an extended analogy in order to explain the widely misunderstood phenomenon of

evolutionary continuity. An oft-cited counter argument to evolutionary theory is the premise that if every creature born must belong to the same species as their parents then they must have each been independently created. But as Dawkins explains through a well-crafted thought experiment, evolutionary kinship and organic diversity in fact go hand in hand.

Speaking directly to the reader, Dawkins asks them to imagine piling a series of photographs on top of each other, beginning with their own, and then their father's, followed by their grandfather's, and so on in ancestral regress. After a short aside about his own grandfather, Dawkins then asks the reader to imagine that they have overlaid 185 million photographs upon each other. As he explains, the pictures "would form a tower about 220,000 feet high: that's more than 180 New York skyscrapers standing on top of each other" (39). Playing with familiar concepts and images as Darwin did, Dawkins gently eases the reader into a contemplation of the alienating realms of deep time. He writes colloquially and convivially, with no airs and no jargon, and poses frequent rhetorical questions: "How many greats do we need for our thought experiment? Oh, a mere 185 million or so will do nicely!" (idem).

At this point the author has given form to the scale of his concept through the image of the skyscrapers. However, in the event that his analogy begins to lose the reader, he reaffirms the message by transposing the context to a bookshelf, which spans "about forty miles" (idem). He then asks us to walk along this shelf, imagining that every organism in the line looks as much like its neighbour on either side "as any man looks like his father and his son" (40). Yet at one end of this spectrum there is a picture of a human, and at the other, a fish. How can this be? As Dawkins reassures us, "it isn't all that difficult to understand" (idem). By way of explanation he launches into yet another analogy, this time about ageing. In so doing, he gently leads the reader to a moment of revelation by reminding us that there was never a person who went to bed one night middle-aged and woke up old. Throughout this extended analogy, Dawkins draws upon everyday situations and examples in order to render the

concept of gradual evolution less alienating. Like ageing, evolutionary change is often imperceptible for long periods of time, but wait long enough and it can be profound. The counterintuitive is at last rendered coherent.

In his many modern origin stories, Dawkins unites scientific concepts with literary expression. Like Darwin, he adopts a literary persona within his texts and engages the reader in a rhetorical conversation, imparting wisdom and guidance through narratives and thought experiments that provoke awe, wonder and enlightenment. In *The Ancestor's Tale*, Dawkins fashions himself as the Chaucerian guide: a “genial host” who guides all pilgrims through their journey standing “impresario to their tales” (597). Exploiting a similar narrative structure to that in Dante’s literary origin story, *The Divine Comedy*, Dawkins is part Virgil and part Dante. He leads and guides, yet also narrates with provisionality and genuine uncertainty. Like Dante, Dawkins is situated within and beyond the text simultaneously. He is at once a literary persona and everyman whose quests and queries pertain to all humanity, whilst also serving as the wise guide and author, imparting knowledge and genuine philosophical insights through literary expression. Mirroring Chaucer’s model more explicitly, Dawkins is the ‘Host’ of *The Ancestor's Tale*, the guide who decides in what order the pilgrims narrate their tales. But he is also Chaucer: both the omniscient author, and the at times naïve character and humble human pilgrim.

The hybrid literary strategies that Darwin employed in *The Origin* proved highly successful and influential when the text was first published in 1859. They remain so today, which is why authors such as Dawkins, Krauss and Carl Sagan have composed modern origin stories in generically similar (though idiosyncratic) fashions. Poetic and literary language and inspiring analogies that play with scale and perception are common among the genre. These elements are invariably united with a theoretical purpose, through which the author typically speaks to the human sense for conduct. The trinity of magic, story and lesson is omnipresent in this

genre: perhaps no more so than in the writings of Carl Sagan, who has crafted some of the most imaginative literary analogies and reflections of scientific theory ever written.

In his modern origin story, *Dragons of Eden* (1977), Sagan channels the poetic mentality that Dawkins wrote of in *The Magic of Reality*, into a breathtaking analogy, built upon the self-devised concept of the ‘Cosmic Calendar.’ In this analogy, Sagan asks the reader to imagine that the entire 15 billion year life of the universe¹⁹ has been condensed into a single calendar year. In the cosmic calendar year:

The Earth does not condense out of interstellar matter until early September; dinosaurs emerge on Christmas Eve; flowers arise on December 28th; and men and women originate at 10:30 P.M. on New Year’s Eve. All of recorded history occupies the last ten seconds of December 31st; and the time from the waning of the Middle Ages to the present occupies little more than one second (n. pag.).

Sagan has an uncanny knack for framing life from a cosmic perspective, overthrowing characteristic human conceits in the process. Yet he never fails to reaffirm beauty and consolation. One could argue that he reduces humanity to a feeble and insignificant footnote in this thought-experiment. But herein lies the lesson; in Sagan’s philosophy we are both of these things. Consolation and provisional salvation lie in the challenge to live purposively; to foster enlightenment, empathy and progress. By realising that we are not cosmically significant it becomes all the more remarkable that we have come as far as we have in our understanding and exploration of the universe. Despite our smallness, we have an astonishing capacity to make meaning and value in our own lives, and we have the potential to achieve great things: to view, understand, and even travel among the stars.

In his most famous modern origin story, *Cosmos* (1980), Sagan moralises even more explicitly, with messages that derive their essence from a scientific worldview. Throughout

¹⁹ 15 billion years was the estimated age of the universe when *Cosmos* was first published.

the narrative, Sagan characterises the human race as “the remote descendants of the Big Bang, dedicated to understanding and further transforming the Cosmos from which we spring” (2011; 24). The first assertion is a matter of scientific consensus, but the second is a value judgement. In this narrative, as with all modern origin stories, empirical insights influence the human sense for conduct, which is pondered and framed in literary language.

In the closing lines of *Cosmos*, Sagan provides a provisional answer to the question: ‘What are we?’ His response is a summary reflection on the themes that have dominated throughout the narrative: flux, evolution, complexity and long time. He writes:

We are the local embodiment of a Cosmos grown to self-awareness. We have begun to contemplate our origins: starstuff pondering the stars; organized assemblages of ten billion billion billion atoms considering the evolution of atoms; tracing the long journey by which, here at least, consciousness arose. Our loyalties are to the planet. *We* speak for Earth. Our obligation to survive is owed not just to ourselves but also to that Cosmos, ancient and vast, from which we spring (2011; 374).

Loyalty? Obligation? This is not science per se. These value-laden reflections comprise one of the many complex facets of the modern origin story, a genre that, although scientific, is not an expression of science in isolation. Reflecting on the enduring themes of literature throughout the ages, Sagan channels science and storytelling into a complex and generically discursive narrative. Throughout this narrative he provides a broader mythic statement, which contains social, moral and metaphysical reflections. Like Oscar Wilde, who famously wrote, “we are all in the gutter, but some of us are looking at the stars” (519), or Joni Mitchell who sang, “We are stardust / Billion year old carbon / We are golden” (n. pag.), Sagan responds to questions that have stimulated the greatest works of art; questions that a human mind cannot help but ponder and be stirred by: Where do we come from? What are we? Where are we going?

Texts like Darwin's, Dawkins', Krauss' and Sagan's are products of the complex modern world. They are contemporaneous with modernist and postmodernist literature and share the common traits of generic complexity, fragmentation, pervasive intertextuality, pastiche and appropriation. However, unlike postmodernists, the authors of modern origin stories do not seek to obscure or nullify meaning as a way of grappling with and expressing complexity. On the contrary, they hark back in many ways to earlier literary ideals of purposively instructing and enlightening. True to contemporary sensibilities, these texts are not simplistically moral and do not claim a dogmatic monopoly on truth and value. By their authors' admissions they are provisional and imperfect. Yet in spite of this, the authors do not advocate abandoning the quest for knowledge; rather, they seek to update social values and ethics without prescription or coercion, according to emerging empirical insights that consistently reinform our conceptions of reality.

Like Jonathan Swift's generically elusive *Gulliver's Travels*, modern origin stories are hybrid texts, which take readers on imaginative journeys through space and time, from the beginnings of the universe, to the inner workings of DNA, to the farthest reaches of outer space. Narrative events operate on many scales, with the micro and macro worlds interacting, but these texts are no less literary for combining aestheticism and didacticism – or beauty, and a sense for conduct. The authors of modern origin stories engage with manifold generic conventions and refashion the elements of thousands of years of literary tradition. They do so in order to do what every good writer has done before them: to consider the nature of the human and the earthly, and to ponder what lies beyond 'this goodly frame.' Like Swift and his Augustan contemporaries, the authors of modern origin stories harness the best of both cultures. They unite the sciences and the humanities in a new genre that stands on the shoulders of the giants of old, imparting narrative-driven lessons that are simultaneously persuasive and enchanting.

Conclusion

It is change, continuing change, inevitable change, that is the dominant factor in society today. No sensible decision can be made any longer without taking into account not only the world as it is, but the world as it will be.

– Isaac Asimov, *Asimov on Science Fiction* (1981)

In 1941, Grace B. Sherrer wrote about the changes in the American literary climate and stressed that they were a direct result of the profound metamorphoses occurring in the modern world. Sherrer was baffled by many of her more conservative contemporaries, who insisted that literature is immutable, and that it should reflect ideas of permanent social interest. In response, she identified that the interests of the American people were evolving, and that teachers could not hope to impart anything meaningful to their students unless they began to frame knowledge through the lens of the present. Thus, her answer to the question, what can the teaching profession “do with a changing literature in a changing world?” was very naturally; “read it and, by reading, acquaint ourselves with the spirit of our time” (637).

This thesis has attempted to foster a better acquaintance with the spirit of the present, by questioning how fluid literary boundaries and diverse narrative manifestations can be better understood in this novel age of consilience. As I have argued, the modern origin story is a quintessential example of twenty-first century literature. Texts belonging to this genre are interdisciplinary hybrids, and share many discursive aims, functions, and generic and literary features. Many linguistic, conceptual and aesthetic elements that could be considered ‘extra-literary’ are seamlessly interspersed throughout these narratives and rendered literary in their amalgamated forms. As with all origin stories, the overarching purpose of these narratives is to speak of numerous facets of human nature, societies, cultures and contexts simultaneously, and to channel these manifold insights into a broader, unified perspective. Like the verse

essay and the novel before them, and like film and many forms of digital storytelling today, modern origin stories are yet another link in the great chain of literary becoming.

Having laid some of the groundwork for a meaningful examination of this new and increasingly prominent literary genre, I suggest that a number of questions remain. A worthy endeavour for a subsequent research project may be to refine the limits of the genre of the modern origin story, and to consider in greater detail the nature of its relationship to popular science writing and communication at large. It may also be worth considering the following: if the fluid, global origin story of the present can be said to be comprised of innumerable meta-narratives, is there a limit to the size and scope of these tales when classifying them as modern origin stories? Or does every scientific account that elucidates facts about the natural world count as a meta-origin story?

As exemplified in the early stages of this thesis, literary-critical projects that examine the narrative strategies of modern science writing are becoming increasingly common in the academy. Closer examination of the works of the literary exploits of Krauss, Dawkins, Darwin and Sagan, as well as other authors of modern origin stories, would be worthy undertakings for a modern literary critic. Although I have conducted close textual analysis in my research, there has only been scope in this exploration for a general summary of many points, particularly with regards to literary techniques and narrative strategies. These have deliberately been chronicled in broad terms, in order to paint an overarching functional image of the genre in question. While it was not possible to provide a significant array of comparative references to traditional creation myths in this study, I suggest that such a project would also make for a worthy and complementary endeavour.

Ultimately, I hope to have given credence to the view that modern origin stories are literary narratives, which can be meaningfully understood through the generic framework provided.

The authors of these texts overtly aim to communicate scientific theory through persuasive and poetic narratives; of the kind that do not seek to rival or displace the best of literature, but rather to sit proudly beside them as complementary testaments to human ingenuity, and to the insatiable appetite to explore and express the unknown. By examining narratives of this kind, and by acknowledging their literary worth and social influence, I posit that we will be better placed to understand the ceaseless social and literary evolutions that are shaping our lives today. In turn, we will be well placed to consider where we are going, both as storytellers, and as a species navigating within the space of an author-less narrative of indeterminate ends.

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