Who Speaks Truth to Fiction? Scientific Authority and Social Difference in Speculative Fiction

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ABSTRACT

The term "science fiction" has in itself a contradiction: if science is truth, and

fiction is make-believe, how can the two come together? The authors, readers, and fans of

science fiction have come together to create a set of informal rules for how to deal with

this contradiction, allowing fictional science when it is realistic, rigorous, backed up by

evidence (which I call empiricism), and free of any obvious bias (which I call

objectivity). There are areas, though, where these rules break down. Some of these areas

are tied to genre, centered on works that may or may not be science fiction or the larger

umbrella genre of speculative fiction, including fantasy. But some of these areas seem not

to have a clear cause, causing friction within the larger speculative fiction community.

Studies of science and engineering, I argue, offer an explanation: realism, rigor,

empiricism, and objectivity are frequently used to hold women and people of color to

higher standards than other community members and epistemologically privilege white

and male experiences. Women and people of color in science and engineering are told

that their work is incorrect or unrealistic without basis; they are told that their work is

insufficiently rigorous; they are told that their evidence is not as good as it is, or their

work is attributed to someone else entirely; and they are told that they are not capable of

being unbiased and producing unbiased work. I argue that these expectations have been translated into science fiction, potentially contributing to arguments and disputes that have caused significant conflict in the community. I look at novels that were nominated for a major speculative fiction award, the Hugo Award, between 2008 and 2012 to see how authors establish made-up facts in their texts. I then analyze online book reviews of those same texts to see if there are patterns in how readers respond to these speculations. Lastly, I look at statements by the authors themselves to document their experiences of both writing and how readers have interacted with them about the reception of their texts. I find that, much like in science and engineering, the rules about realism, rigor, empiricism, and objectivity are enforced differently against women and people of color, which potentially indicates that the cultural view of science has these inequitable norms embedded into it.

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GENERAL AUDIENCE ABSTRACT

The term "science fiction" has in itself a contradiction: if science is truth, and fiction is make-believe, how can the two come together? The authors, readers, and fans of science fiction have come together to create a set of informal rules for how to deal with this contradiction, allowing fictional science when it is realistic, rigorous, backed up by evidence (which I call empiricism), and free of any obvious bias (which I call objectivity). There are areas, though, where these rules break down. Some of these areas are tied to genre, centered on works that may or may not be science fiction or the larger umbrella genre of speculative fiction, including fantasy. But some of these areas seem not to have a clear cause, causing friction within the larger speculative fiction community. Studies of science and engineering, I argue, offer an explanation: realism, rigor, empiricism, and objectivity are frequently used to hold women and people of color to higher standards than other community members. Women and people of color in science and engineering are told that their work is incorrect or unrealistic without basis; they are told that their work is insufficiently rigorous; they are told that their evidence is not as good as it is, or their work is attributed to someone else entirely; and they are told that

they are not capable of being unbiased and producing unbiased work. I argue that these

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women and people of color.

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A committee is more than just a chair, of course. Christine Labuski has been game for gut-checks and reassurances to my internal physics major that actually feminist methods are fine and I don't have to have consulted literally every source. Ashley Shew's enthusiasm has helped me maintain the "sensawunda" and *enjoyment* of this project, and nobody is as good at framing an incisive criticism as encouragement as she is. Elizabeth Mazzolini was absolutely formative in the early stages and her work has been essential in helping me understand how weird, cool, interdisciplinary STS-and-also-literature work can look. (Sometimes it looks like Mount Everest!) And Lisa Yaszek has been in my corner for gut-checks, looking over article drafts, and general science fictional moral support.

Chapter One: Introduction

The Project as a Whole

Much research has been done on the ways that social values underlie science, technology, and everything in between. Plenty of that research has offered explanations: excavations of the subtle ways that scientists' educations steer them towards certain values, or how technologists' professional development suggest certain courses of action when creating technologies. A significant portion of this research attends specifically to issues of when these values advantage some social groups and disadvantage others, particularly along the axes of race and gender. Those belonging to socially marked categories (such as "woman" or "nonwhite") tend to be devalued, mistrusted, stereotyped, or otherwise marginalized within technoscience, to the point that some propose that technoscience enacts a binary distinction: there are things (and people) that are technical (and unmarked), and there are things (and people) that are social (and marked). This technical/social binary has been shown repeatedly to operate within engineering and STEM writ large (see sections "Gender, Race, and Technoscience" and "Whiteness, Masculinity, and Technoscience"). Yet if this binary is trained into scientists and technologists (whether in education or their professional lives), one would expect it to solely operate among these formally trained individuals.

Due to its long relationship with technoscience, the speculative fiction community provides an ideal testing ground for this. If the technical/social binary operates in the speculative fiction community, where many do not have formal training or education in technoscience but are self-taught, then the issue of--and potential damage caused by--the binary may be more complex than initially thought.

This dissertation studies the ways that scientific norms are enacted within the speculative fiction community, focusing specifically on four: realism, rigor, empiricism (or use of evidence), and objectivity (or freedom from bias). I find a pattern of norms being applied differently to women authors and authors of color, aligning with the documented effects of the social/technical binary. As these norms are generically aligned with *science* fiction and used to distinguish science fiction from speculative fiction more generally, these norms (and therefore their effects) are taken as inherently scientific. Science grants these norms authority, and it is an authority that has been found in technoscientific contexts to disproportionately disadvantage women and minoritized people--including through these very norms.

What I aim to grasp, then, is the way that the nebulous cultural authority of science brings its inequities with it when it spills into informal spaces. The instances of boundary-work, whether in dividing legitimate speculations from spurious or science fiction from speculative fiction more broadly, construct ideas of what is scientific and thus what science is. That such boundary-work also performs gender and race by favoring a white and male science is not a coincidence. As this chapter will show, it has been well-documented in technoscience, from the lab to the classroom, and as later chapters will show it is remarkably consistent in how and when it exerts power in speculative fiction.

Speculative fiction (hereafter SF) has been analyzed along the axes of sex and race in many scholarly works, particularly those criticizing the content (i.e. plot, characters, and representation in general) of historical works of SF (see, for instance (Cheng 2012; Lavender 2011; Rieder 2008; Donawerth 1997; Roberts 1993; Kilgore 2003; Pfitzer 1995)). The more common phrase "science fiction" remains a nebulous term, defined by many as a body of

literature in conversation with itself absent a consensus on the genre's boundaries.[1] Additionally, the genre has long been marked as a community of not just creators but also active fans.[2] Still, in this project, I will be using the term "speculative fiction" (SF) unless I am explicitly mirroring someone else's specific usage of "science fiction." The definition of science fiction is at best amorphous and at worst fodder for unending debates, and the use of the term "science" may imply that science itself is a fixed and stable referent. I do not assume that either science fiction or speculative fiction is a stable and fixed genre. Indeed, the boundary work undertaken by speculative fiction authors to establish their work within the genre (and to establish other works as *outside* the genre) lies at the core of this project.[3] This follows John Rieder's (2017) theories by considering generic labeling and contestation as discursive claims that are deeply implicated in defining communities of practice; that is, claiming a work as "science fiction" is not just an act of categorization, but of claiming insider or outsider status within the science fiction community (see section "Definitions of SF" for more detail).

Certain values have been shown to signal insider or outsider status in technoscience in gendered and racialized ways, and this project interrogates the speculations in SF to address

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[1] See, for example, Aldiss's conception of science fiction as the body of literary descendants of Mary Shelley's *Frankenstein* (Bould and Vint 2011) or Vint's portrait of SF as a megatext with multiple creators engaging in a system with shared signs of meaning beyond what exists in a single text (Vint, 2014). In contrast, Suvin theorized science fiction as the literature of cognitive estrangement (Suvin 1979) and Delany instead characterized it as the literature of "*events that have not happened*" (Delany 1977, 32; emphasis in original).

[2] Cheng's *Astounding Wonder* traces the social interactivity of pulps through letter pages, fan associations and clubs, the foundation of fanzines as a genre of fan activity, and, of course, science fiction conventions in the 1930s; he also expounds on the historical consequences in his epilogue. While many of these practices have evolved over the decades, several still exist and new practices have evolved. For one example, see Penley's study of the reciprocal relationship between NASA and Star Trek fandom in *NASA/TREK*; for more, see the section in Chapter Two "Cultural Context of the History of SF."

[3] I take inspiration here from Gieryn's 1983 seminal study of boundary-work in the legitimation of science.

whether those same values operate in similar ways in that context.[4] This question is of particular interest in the murky boundary waters between "science fiction" and "speculative fiction," where definitions of science, knowledge, and legitimate speculation are particularly scrutinized as part of the demarcation process. If the difference between science fiction and speculative fiction is the legitimacy of the knowledge on which the speculation is based, and the legitimacy of the knowledge is steeped in a community for which insider or outsider status is deeply gendered and racialized, then race and gender may serve similar functions in the demarcation of speculative fiction and science fiction.

Implied in this analysis is the idea that science is not solely done in the laboratory. This dissertation takes as given that the messy cultural construct called "science" (which frequently includes not only scientific facts, but also technological artifacts, scientific practices, and rationalistic or positivistic worldviews, for starters) is produced and negotiated as much in informal spaces as formal ones. The field of Science and Technology Studies (STS) has done some work to document how, for instance, speculative fiction in popular culture can serve as a discursive resource for technoscience.

Sociologist David Kirby's *Lab Coats in Hollywood* is perhaps the most comprehensive (i.e. book-length) work within STS that deals with SF by studying science advisors for big-budget Hollywood films (Kirby 2011). Yet Kirby's study uncritically adopts a dissemination model of the public understanding of science, treating the narrative needs of the films solely as

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[4] The section "Gender, Race, and Technoscience" will cover these values in more detail, but these values include the construction of a technical/social binary as enacted by applying the norms of realism, rigor, empiricism, and objectivity where they arguably should not apply.

shallow "entertainment" compared to the scientific knowledge that the advisors wish to convey. Colin Milburn takes a step away from that unidirectional flow by suggesting that SF provides inspiration for scientists to remix their own work and dip into speculation (Milburn 2010). Megan Stern uses SF (specifically *Jurassic Park*) as an exemplar of the dynamics that exist within technoscience as well as a case study of the mutual relationship of the film to the field it dealt with, showing how natural history museums responded to the renewed interest in dinosaurs and the factual inaccuracies in the film (Stern 2004). Felicity Mellor makes a similar argument for near-Earth asteroid research and films such as *Armageddon* and *Deep Impact*, showing how the multiplicity of impact narratives provided a rhetorical resource to justify the militarization of space (Mellor 2007). In that vein, Michael Mulkay and Sherryl Hamilton show how SF provides a boogeyman of a mad scientist in public debates about the use and ethics of technoscience: a place where worst-case-scenarios can be played out and tested (Mulkay 1996; Hamilton 2003). On the other hand, images of the scientist-as-hero persist in popular culture as well, signaling an ambivalence towards science (Koopman 2021).

 In this chapter, I will briefly summarize the insights from the social studies of science and engineering, including social studies of STEM education, regarding the relationship between individual identity and science before outlining the dissertation.

Gender, Race, and Technoscience

STS has interrogated the gendered and racialized facets of technoscience through many different lenses.[5] Note here that in this project I take gender and race to be categories that are both socially constructed and real--that is, gender acts as a binary in precisely the situations where it is constructed as such, and the racialization of non-white people remains salient so long as "not white" is noted and acted upon as a category of difference. As I will discuss more in the "Methods and Theoretical Grounding" section, the sample of novels used in this project necessarily limits its ability to comment on other categories of difference such as gender outside the binary, queerness, disability status, and so on; I am delighted to say that should this project be repeated with a more recent selection of Hugo nominees, that would no longer be the case.

Theodore Porter's study of how quantification (frequently equated with objectivity) gained popularity notes that generally-accepted conceptions of objectivity bring with them a masculinist and Eurocentric worldview (Porter 1996: 76-77). Donna Haraway expands upon this by picking apart the way that unmarked categories (in particular "white" and "man) construct a view of objectivity that figures marginalized categories as innately subjective--and unmarked categories as implicitly objective. This shift away from equating objectivity and universality instead emphasizes the importance of acknowledging situatedness to better articulate the perspective from which knowledge claims originate. By rendering the unmarked categories of

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[5] I use "technoscience" expansively and advisedly here. In my use of the term, I follow Haraway in deliberately rejecting a firm, concrete definition and embracing the messiness of a term that frequently means whatever is being pointed to in the moment. As Haraway says, "I want to use technoscience to designate dense nodes of human and nonhuman actors that are brought into alliance by the material, social, and semiotic technologies through which what will count as nature and as matters of fact get constituted for--and by--millions of people." (Haraway 1997: 50)

Western science as once again marked and embracing ambiguity as necessary for an honest science, this formulation of situated knowledges aims to create a more level playing field to create accounts of the world (Haraway 1988).

Similarly, Helen Longino argues that a plurality of subjectivities is necessary to achieve an objective *procedure* of science that is more likely to generate objective *truths*. By leveraging different subjectivities against each other, she argues, a diverse collection of criticism is likely to better identify any specific subjectivities that may bias the resulting knowledge (Longino 1990). In this view, a group of entirely white male scientists have no safeguards against producing knowledge with a white male bias--with those particular subjectivities aligned, they will likely miss any resulting bias they inscribe in their knowledge. Thus, according to Longino, the inclusion of women and underrepresented minorities (and, indeed, any range of points of view) provides a more objective science. Furthermore, works such as Christina Dunbar-Hester's study of low-power radio hobby groups (2008)(2008), Ronald Eglash's breakdown of race and the figure of the nerd (2002)(2002), Wendy Faulkner's studies of the relationship between gender and engineering (Faulkner 2000b, 2000a, 2007), and Ulf Mellström's case study of the performance of masculinity among technical specialists (2004) examine the links between technology and masculinity (and, in the case of Eglash, race as well).

I draw heavily in particular on Faulkner's accounts of the construction of a binary between "the technical" and "the social," as well as how gender and technoscientific identities (in her case studies, engineering identities specifically) co-produce each other (Faulkner 2007). Faulkner highlights four features of the technical/social binary that are particularly relevant to this project:

First, the two sides are deemed to be mutually exclusive: you can't be into both technology *and* people at the same time. Second, following on from this, male engineers share an intense pleasure and pride in technology which (amongst other things) acts to confirm engineering as a masculine domain. Third, engineering professional training, identities and practice are permeated by a strong sense of the technical which specifically excludes the social. Fourth, in spite of all the above, the distinction between narrowly-specialist and more heterogeneous rôles [sic] becomes gendered in quite contradictory ways, in terms of differences in the jobs and styles observed in women and men engineers. (Faulkner 2000a: 764-65)

Faulkner also notes that gender differences (and the binary between the technical and social by extension) are "more evident in discourse than in practice" (Faulkner 2000a). Thus, focusing on discourse (i.e. reviews and interviews) as well as texts (i.e. the products of practice) provides more insight into whether the technical/social binary extends from engineering into less formal domains associated with technoscience--in the case of this project, obviously, SF.

These works highlight not only the ways that gender is constructed in technoscientific contexts, but also how *technoscience* is constructed in a necessarily gendered way. Gender work, in these spaces, constructs science as much as science constructs gender. The question of who gets to do the work of constructing science is also limited by gender--and, more broadly, the question of who gets to do the work of constructing legitimate knowledge about the world is *also* so limited, as Pereira (2019) shows in the context of Women, Gender, and Feminist Studies in Portugal.

The limitations of boundary-work in academic and intellectual spaces spill into the material conditions and experiences of people engaging in technoscience. Indeed, Christina

Dunbar-Hester takes pains to note the inclusive efforts of the low-power FM radio hobby group

that she observed, and how those efforts were nevertheless unsuccessful:

> Geek Group was originally conceived as a forum to teach technical skills that empower
>
> both women and men, and implicitly, this was seen as a radical opportunity for women.
>
> Yet in practice, the geeks' interactions with the technology paradoxically challenged their
>
> ability to subvert it. The social arrangements surrounding electronics hardware skills,
>
> evident in both the history of FM tinkering and the geeks' own experiences...play a role in
>
> deciding which people will come to the group already comfortable with electronics
>
> hardware. And the culture of a group of men working on hardware tinkering (even a
>
> group of men committed to feminist ideals) has not abolished 'masculine' identity
>
> displays, exemplified in both the performances of bravado surrounding risk and the
>
> 'competitive' culture described by Ellen [previously in the paper], which may serve to
>
> make the Geek Group work feel unfamiliar or uncomfortable to many women. This is
>
> frustrating for women who want to identify with technology and the skills associated with
>
> it, frustrating for men who do not wish to be in the position of teaching women whom
>
> they desire to treat as equally as possible, and frustrating for a group with limited time
>
> and resources who find themselves confronted [with] the realities of gender differences
>
> they did not create while attempting to realize their activist goals. (Dunbar-Hester 2008:
>
> 222-23)

This quote it demonstrates the complex entanglement of masculinity and technoscience

even outside of traditional STEM employment or research. The pedagogical aspirations of the

Geek Group gave way to masculine competition and bravado, a situation which limited time and

resources compounded to create an atmosphere that--despite the explicitly feminist orientations

of many members of the group--reinforced gendered associations of technoscience. It is not hard to see how this dynamic may also occur in racialized situations, as Eglash also points to radio amateurs as the beginning of the white male nerd (2002: 50-51). Furthermore, Eglash notes that "nerdy" pursuits and attitudes in African-Americans may draw accusations of "acting white" due to the racialized (white) nerd identity, and Williams (2021) analyzes the ways that gender, race, and gendered and racialized epistemologies get literally built into technologies.

Philip Olson and Christine Labuski label the discursive tendency to focus technological discussions and imaginings as a white technomasculine imaginary. (Olson and Labuski 2018) Though they look specifically at discourses surrounding unmanned aircraft systems, I argue that this imaginary is also highly relevant in discussions of SF, particularly in the current moment where issues of gender and race loom over nearly every discussion. Olson and Labuski point out how this imaginary makes it more likely that technologies (specifically, drones) will "rehearse the social hierarchies by which they were generated and that perpetuate unmarked white technomasculinity." (Olson and Labuski 2018, 545) This rehearsal is precisely what SF has been accused of by many works of criticism that analyze the representation of underrepresented groups in SF (see "Histories and Historiographies" in Chapter 2).

Furthermore, I argue that this imaginary may be present and relevant even when individuals actively aim to fight it, as Dunbar-Hester suggests. That the (male) geeks don't *intend* to alienate women becomes irrelevant, as the imaginary at play constructs technoscience and femininity (or, as Eglash shows, blackness) as mutually exclusive and the activities in which the Geek Group operates reinforce that divide.This is consistent with Kate Manne's analysis of misogyny, as she embraces a conceptualization of misogyny that focuses not on the intent or even actions of those who do misogynist acts but instead on those who face misogyny;

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specifically, "we can focus on the hostility women *face* in navigating the social world, rather than the hostility men (in the first instance) may or may not *feel* in their encounters with certain women." (Manne 2017: 60)

This focus on impact over intent runs deeply through this project, not only in the context of white technomasculinity but in the project's approach to authorship and its rejection of pure authorial intent, as I will discuss in the next chapter. It also follows from intersectional feminist work as well as critical race theory (e.g. Bonilla-Silva (2021)'s formulation of systemic racism).[6]

Perspectives from STEM Education

As Pereira (2019) and Subramaniam (2009) both note, while feminist STS has theorized the relationships between race, gender, and technoscience, it has recently turned its attention away from the experiences of women and racialized people *in* technoscience. While there are certainly studies that have described the culture in which scientists operate (Traweek (1988)'s "culture of no culture" comes immediately to mind), much of the contemporary work on the lived experiences of people--particularly marginalized people--in technoscientific environments occurs in the context of education research.

The epistemological work and case studies of specific interactions of race, gender, and technoscience that STS does are vitally important, but they are not sufficient to understand how technoscience operates. Technoscience, particularly in its fuzzier and prefix-less form as the cultural conception of science, is not only present and salient when a specific fact or

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[6] It does not, however, address other social categories of different, in part due to the sample of novels used for this project and in part due to the systematic lack of attention paid to some categories in STEM, such as disability. (Svyantek 2016)

technological artifact is deployed. The cultural authority granted to science does not need to be specific to operate. Much of the work that has been done on this more subtle influence of technoscience has been in the field of STEM education, where the disproportionate attrition of women and marginalized students has been identified as a problem of a "chilly climate."

There are several reasons this research may be done where it is, most notably that education researchers have easy access to a large body of ethnographic subjects in their home institutions. However, as the *lack* of women scientists and scientists of color has increasingly been commented upon by institutions such as the National Science Foundation, as the share of degrees awarded to these populations have stagnated at disproportionately low rates (Carter, Rzo Dueñas, and Mendoza 2019), education researchers have identified schools and universities as crucial sites of where technoscience is constructed--and therefore where it is determined *who can do technoscience*. Who perseveres in STEM (science, technology, engineering, and mathematics) education is closely tied to who can incorporate STEM into their own identity, or who can feel like they belong in STEM fields (Tonso 2014). The experiences of women and scientists of color in STEM are not insignificant to who ends up doing technoscience and therefore what technoscience gets done.[7] When women and scientists of color leave STEM at disproportionate rates, the result is that fewer women and people of color are formally, culturally, and professionally legitimated to speak for the natural world.

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[7] See, e.g., Tuana (2006)'s exploration of the "epistemologies of ignorance" in the women's health movement that highlighted what had never been learned because scientists had never studied women's bodies. On the engineering or technology side, the evergreen example is motion sensors that fail to recognize highly melanated (i.e. dark) skin.

Furthermore, education is a key site of boundary-work in science. Gieryn notes three genres of boundary-work: expulsion, or the social control of who can access the legitimacy of science; expansion, or the contest over disputed epistemic areas; and the protection of autonomy, or the protection of intellectual autonomy from non-scientific concerns. The first genre is the most relevant to this project (although there are certainly shades of the second two), as education is a site where women and people of color are systematically and disproportionately expelled from science, and thus denied access to science's epistemic authority. Although Gieryn focuses on boundary-work as working *for* science, I find it worth pointing out here that the work goes both ways: the work of expelling women and people of color from science may not explicitly aim to protect the epistemic authority of science, but the end effect ensures the whiteness and masculinity *of* that authority.

Additionally, as I focus in part on the research practices of authors--that is to say, the acquisition and selection of knowledge claims on which to base speculation--I find the literature on education and participation to be helpful, as it often explicitly foregrounds the entry costs into technoscience and STEM.

Flis Henwood's discursive project studying women in a college of technology reinforces many of the STS case studies on masculinity and technology (Henwood 1998). As mentioned in the previous section, Wendy Faulkner in particular sheds light on the constructed dualism between "the technical" and "the social" in engineering and how it might be co-constructed along with a gender dualism (2000a).[8] Elaine Seymour and Nancy Hewitt specifically examine the

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[8] This, of course, has resonances with C.P. Snow's "Two Cultures" problem.

reasons for undergraduate attrition in STEM, with chapters devoted to gender and race (Seymour and Hewitt 1997). They note that gendered pre-undergraduate socialization plays a significant role in the attrition of women, despite its nebulous origins,[9] while disproportionate under-preparation when entering college and chilly campus environments impact under-represented minorities.[10] Curiously (and alarmingly), Elaine Ecklund and her colleagues suggest that men and women perceive the causes for gender imbalances in science differently, stating that "both men and women cite preferences and mentoring as explanations [for the difference in sex composition in disciplines], while women are more likely to note discrimination, suggesting that perceptions of discrimination in science are highly gendered" (Ecklund, Lincoln, and Tansey 2012: 709). Lastly, Sapna Cheryan et al's study of ambient belonging's effect on women's interest in computer science made two discoveries relevant to this project. First, they began by generating a list of items considered to be stereotypically associated with computer scientists or computer science students in order to create either a stereotypical or neutral environment; the stereotypical items included "a Star Trek poster, comics, [and] video game boxes" (Cheryan et al. 2009: 1048). This shows an association between practitioners and learners of science and cultural artifacts associated with speculative fiction. Second, these stereotypical objects reduced women's

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[9] From page 241: "[D]espite their teachers' support, many women described difficulties in 'giving themselves permission' to choose [STEM] majors and found it hard to explain precisely what had discouraged them. Their explanations referenced the dampening effect of cultural messages which suggested that women either couldn't, or shouldn't, do science." (Seymour and Hewitt, 1997)

[10] These are the factors most relevant to the project that are relatively unique to women and underrepresented minorities.

interest in studying computer science.[11] This suggests a link between the perceived masculinity of speculative fiction and reduced participation of women in STEM.[12]

Methods and Theoretical Grounding

Several important theoretical apparatuses underpin my methodological choices. First, I must address the difficulties of discussing and defining SF. Secondly, I address issues related to authorship and the exploration thereof. Lastly, I elaborate my own location with respect to both my field of scholarly inquiry (STS) and the field that I am studying (SF).

Definitions of SF

While there is much that can be said about different conceptions of SF, it is in fact so much that a thorough consideration is outside the scope of this dissertation. Instead, in this section I will provide a brief overview of different definitions, both theoretical and historical, before describing the approach I will adopt: John Rieder's application of genre theory to SF, considering genres as historically contingent. It is crucial to note that there is no consensus on a definition or history of SF and, indeed, disputes over where the genre's boundaries lie are a regular feature of the SF community.

However, there are certainly commonalities across different conceptions of science fiction. A common historical origin for the genre is Mary Shelley's *Frankenstein*, a stance which has been popularized by authors and critics such as Brian Aldiss and Brian Stableford (Hubble

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[11] Additional studies included in the same paper, which I won't go too deeply into for the sake of brevity, used different methods to hone in on the importance of the gendered environment and once again used objects associated with science fiction. The results were all consistent with a deliberately masculinized environment pushing women away from studying computer science.

[12] For a more complete accounting of the roles of gender and race in STEM education and the STEM workforce, see Fox et al 2016.

and Mousoutzanis 2013: 16). Others argue that works of fantastic voyages or early utopian

works are the origin (Vint 2014: 3). As a distinct publishing market, the science fiction label

came into use during the pulp era and is typically attributed to the efforts of editor Hugo

Gernsback (Bould and Vint 2011: 17). This is certainly when the term "science fiction" (and its

precursor, "scientifiction") was coined (Vint 2014: 3).

Many SF critics and scholars, however, argue against a historical definition of SF in favor

of a theoretical one, often in the context of specifically "science fiction" rather than "SF." Darko

Suvin defines science fiction as the literature of cognitive estrangement, where the introduction

of a *novum*, a "strange newness" (Suvin 1979: 4) creates an attitude within the text of

defamiliarization of the reader's world (estrangement) that then generates critical thinking about

what the deviations mean (cognition). This definition has maintained significant traction in

scholarly studies of science fiction.[13]

Other theoretical definitions of science fiction exist, however. For Samuel Delany,

science fiction is the literature of *events that have not happened*, in contrast to naturalistic

literature's *events that could happen* or fantasy's *events that could not happen* (Delany 1977).

Scholar and critic Istvan Csicsery-Ronay Jr. identifies science fiction as works centered around

two driving concerns: the plausibility of the *novum* and the value judgment of its implications

(Csicsery-Ronay Jr 2008). He identifies seven modes of science-fictionality (though he

acknowledges his list is not exhaustive): fictive neology, fictive *novums*, future history,

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[13] Suvin very specifically did not include fantasy in his definition of science fiction. For discussions of grouping
science fiction and fantasy together, under the umbrella of "SF" or some other terms, see, for instance, Hubble and
Mousoutzanis (109) and Vint (75 and, indeed, all of Chapter 5).

imaginary science, the science-fictional sublime, the science-fictional grotesque, and the Technologiade. Through all of these modes, which he calls "beauties," Csicsery-Ronay Jr. is explicit in his stance that even SF's imaginary science relies more on "the rhetorical appearance of scientific explanation" than a true devotion to the methods and content of technoscience (Csicsery-Ronay Jr 2008: 114).

There are, however, conceptions of science fiction that combine theoretical and historical concerns. The view of science fiction as a megatext holds that the unique characteristic of SF is its self-reflexivity and intertextuality. As Sherryl Vint states, a megatext consists of

> ...a context in which writers operate within an understanding of a certain set of established images and motifs, such as cyborgs or hyperspace or FTL travel, that do not belong to any single text or author, but are shared, each new iteration both relying upon established meanings and associations, and also opening them up to new possibilities, creating a vast and interconnected web of meanings that exceeds what appears in any single text (Vint 2014: 57)

According to proponents of the megatext model of science fiction, this shared context arises from the heavily communal nature of SF's fans. Recognizing references to previous works--the connections that define and sustain the megatext--becomes itself a source of metatextual pleasure for readers and authors.

This model has several resonances with the model of SF that Rieder uses, and which this dissertation will take up. Specifically, Rieder puts forward five propositions about SF (which he uses to refer to science fiction, albeit very fuzzily):

- SF is historical and mutable;
- SF has no essence, no single unifying characteristic, and no point of origin;

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- SF is not a set of texts, but rather a way of using texts and of drawing relationships among them;

- SF's identity is a differentially articulated position in a history and mutable field of genres;

- [A]ttribution of the identity of SF to a text constitutes an active intervention in its distribution and reception. (Rieder 2017, 16)

The third, fourth, and fifth points are most relevant for this project, as I argue that the debate over what makes SF legitimate--particularly what sorts of research practices and therefore what assessments of facticity make a work of SF more or less legitimate--mirror debates over the role of authorship in different areas of the SF community, which in turn mirror debates over the authority of technoscience to exclusively represent reality, which inevitably mirror debates over the authority of white technomasculinity to exclusively represent reality.[14]

SF, Authorial Intent, and the Death of the Author

It is worth noting that this view of SF takes a very different view of authorship than the traditional view of literature. It is most closely aligned with Michel Foucault's conception of the author-function, in which authorship becomes a label by which to organize texts (Foucault 1979). This may be particularly appropriate for SF since, as Gary Westfahl defines the subgenre of "hard science fiction" by extending the author-function to genre. Specifically, he notes the

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[14] SF is far from the only endeavor falling outside traditional disciplinary lines to face difficulties in self-definition; see, e.g., Zacharias (2018)'s description of "the transdisciplinary dilemma" in Science, Engineering, Art, and Design (SEAD).

specific social actions that authors take to classify themselves (and thus their works) as belonging to hard science fiction:

> [A]uthors identify themselves as hard science fiction writers by loudly announcing that fact, by publishing in magazines and anthologies like *Analog Science Fiction/Science Fact* and Jim Baen's *New Destinies* that have a reputation for hard science fiction, and by associating themselves with other well-known hard science fiction writers. (Westfahl 1996: 46)

This aligns with Stanley Fish's notion of interpretive communities, the idea that the interpreting of a text by a reader is always necessarily affected by the set of interpretive strategies that the reader employs; these strategies are themselves negotiated by groups of individuals with a shared slate of strategies, known as the interpretive community (Fish 1980). Peter Rabinowitz extends the concept of interpretive communities to include the author by designating the author's hypothetical audience, i.e. the group of readers that will share the interpretive strategies that the author has employed in writing, as the "authorial audience" (Rabinowitz 1998). As Rabinowitz notes, employing the authorial audience acknowledges authorial intent without granting it unquestioned dominance:

> [This] perspective allows us to treat the reader's attempt to read as the author intended, not as a search for the author's private psyche, but rather as the joining of a particular social/interpretive community; that is, the acceptance of the author's invitation to read in a particular socially constituted way that is shared by the author and his or her expected readers. (Rabinowitz 1998: 22)

Rabinowitz's view also emphasizes the role of the text as a mediator between the author and the reader, without stripping either of agency. The author faces choices of what interpretive

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strategies to employ in their writing, and may well inadvertently signal or flag invitations to other strategies; readers may similarly choose their interpretive strategies in their reading, which may or may not match up with those of the author.

I will discuss this approach to authorship more in the next chapter; however, the use of the concept of interpretive communities and the space for dispute over interpretive strategies when both writing and reading texts combine to point to why this dissertation deliberately will not employ a stable and fixed definition of SF. SF as a genre is not fixed; it is disputed by different interpretive communities with different, though frequently overlapping, sets of interpretive strategies.

Situatedness

I approach this project not only as an STS scholar, but also as a fan whose practices and tastes developed in the context of transformative fan culture.[15] My participation in the SF community, both in terms of my reading taste and participation online, predates my academic engagement with it. I have been a part of online discussions, sometimes heated; I have produced and consumed transformative works; I have attended conventions, with all the attendant practices that implies; I have sought out and consumed original artistic works specifically because of my familiarity with the creator's transformative works.

Furthermore, along with my own fan engagement, I regularly write original speculative fiction. I have attended speculative fiction writing workshops (namely, the Gunn Center for the Study of Science Fiction's Short Fiction Workshop) and have published a few speculative fiction

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[15] For a more detailed description of transformative fan culture, see "Histories and Historiographies" in Chapter 2.

works. I have submitted far more stories than have been published, and consider my activities as an SF author, too, to predate my academic engagement with the community. Although many ethnographers taking up the task of participant-observation may view the production of the works being studied to be an appropriate method of scholarly engagement, in the name of making my own situatedness known, I want to be clear that that is not the temporal or causal relationship here. I did not, as a scholar, make the decision to participate in the community I observe. Instead, a more appropriate model would be Henry Jenkins's concept of the "acafan," in that I am a participating member of a community who decided to apply the rigors of scholarly engagement to attempt to address ongoing issues of interest to the community. I am not aiming to provide an objective, detached account; instead, I hope to assist, first and foremost, the community of fans with which I identify in making sense of the larger discursive contexts of our community's controversies.

In this way, this project has an inevitably activist bent. I make no claims to objectivity or separation, and I am necessarily entangled in my object of study. In particular, as a Latina woman studying a community recently roiled by a controversy steeped in gender and racial politics, there is no way for me to even attempt a neutral position. Furthermore, since neutrality often implies adopting stances most closely associated with social cues of masculinity and whiteness, I do not believe such an attempt would be appropriate or desirable for this project.

In rejecting this neutrality, I have also opted not to adopt a traditionally academic tone. As I discuss further on, the academic voice--also referred to by Gilbert and Mulkay (1984) as the "empiricist repertoire"--is a way of reframing the creation of knowledge to erase any trace of contingency, whether in events, decisions, or people. It is a way, in other words, of achieving Haraway's god-trick; of laundering epistemologically dirty subjectivity into scientifically clean

objectivity, to speak from everywhere and nowhere. As I will go to some pains to explore in this

project, the tricks employed by the empiricist repertoire act as points of conflict for anyone

existing in socially marked categories, for whom no objectivity is ever objective enough. I am

not objective in this project, and I believe that that kind of objectivity is not desirable if it can

only exist in a zero-sum struggle with equity and justice.

I must also make clear, however, that this project does not attempt to take sides on

whether there is a right or wrong approach to any of the concepts I discuss here: there is no

correct stance, superior research practice, or preferable approach to SF. Instead, I hope that this

project will help illustrate discursive divides that exist within the SF community to better help

bridge those divides. As Ecklund et al. suggested that discrimination may be invisible, or at least

not viewed as salient, to certain populations working in technoscience, I have a concern that the

same may be true in the SF community. By collecting, analyzing, and comparing texts, reviews,

and authors' reports of their experiences, I hope to illustrate the differing locations and situations

of authors and texts; and by focusing in on research practices that should theoretically be deeply

tied to conceptions of knowledge and speculation, I hope to interrogate the situatedness of said

underlying knowledge and speculation.

Norms and the Technical/Social Binary

I began this project with Faulkner's technical/social binary as my primary interpretive

framework. However, as I analyzed reviews and authors' statements, I realized that four specific

norms encompass the majority of the boundary-work I saw.

When I refer to "norms" in this project, I do not mean in the sense of normative stances

but instead social norms. Specifically, I use the term to refer to techniques of boundary-work,

following Sara Ahmed's work on norms as institutional walls (Ahmed 2017). As she notes,

When we fail to inhabit a norm (when we are questioned or question ourselves whether we are "it," or pass as or into "it") then it becomes more apparent, like that institutional wall: what does not allow you to pass through. (Ahmed 2017: 142)

Using the metaphor of the wall, Ahmed describes the way that norms apply differently to different people, as some may experience it as an open door while others are kept from passing through. To those for whom it is no encumbrance, it may seem natural, or even entirely invisible, and for those who fought to pass through, their very presence becomes transformed into evidence of the wall's absence.

In reading reviews and author interviews, I identified four specific norms that I have used as the basis for this dissertation. They are:

- Realism: The idea that speculations must conform to certain facets of scientific reality.

- Rigor: The idea that speculations must be carefully thought-through and extrapolated.

- Empiricism: The idea that speculations must have a basis in evidence outside of the text.

- Objectivity: The idea that speculations must be free of any potential bias.

These are hardly the only scientific norms that have made their way into SF, but they were the most apparent in this particular project. Each has also been documented to lead to inequitable outcomes in STEM, sometimes by their knowing and continued violation and sometimes by their outsized enforcement. The contributions of women to science have been so consistently erased from the historical record--i.e. rendered unreal--that the phrase "the Matilda effect" was coined to describe it (Rossiter 1993). Rigor has long been used, as sociologist of engineering Donna Riley points out, as "a thinly veiled assertion of white male (hetero)sexuality"

(Riley 2017: 252). The empiricism employed by scientists regularly overlooks data suggesting

that their education practices lead to inequitable outcomes (Ecklund, Lincoln, and Tansey 2012).

Lastly, objectivity--particularly when defined as "freedom from bias"--is largely relegated to

white men (Prescod-Weinstein 2020).

In this project, I argue that these norms are more specific articulations of the

technical/social binary. That is, that which is social is not considered technically real; that which

is social is not as rigorous as that which is technical; that which is social lacks evidence up to

technical standards; and that which is social is biased, unlike that which is technical. I find that

this framework is not only applied to texts, but is extended to *authors*, particularly those whose

identities fall into marked social categories (i.e. those who are not white men).

Outline

In the next chapter, I will review the social history of speculative fiction, emphasizing the

collective and communitarian nature of the genre's community. The gendered and racialized

values that I have discussed so far in this chapter have been of particular interest to the SF

community since 2013 marked the beginning of several years of turmoil focused on the Hugo

Awards; this is discussed in more detail next chapter.

With that context established, I turn to the three empirical components of this project. For

this project, I draw on 20 of the 25 novels nominated for the Hugo Award for Best Novel

between 2008-2012.[16] The reasons for that particular choice will be discussed more in Chapter 2.

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[16] Five novels were not included in the sample because the author was nominated more than once in this five-year period. Those authors are John Scalzi (*The Last Colony*), Robert J. Sawyer (*Wake*), China Mieville (*The City & The City*), Ian McDonald (*The Dervish House*), and Mira Grant (*Deadline*). For the purposes of the textual analysis and

The first empirical component is a textual analysis dissecting how SF texts establish facts within the fictional nature of their worlds. While much work has been done on theories of worlding, worldbuilding, and imaginary worlds, this analysis focuses instead on the literary techniques used by authors; that is, the ways in which authors package and convey information about their worlds to an audience.

Chapter 3, then, is a catalog of these techniques, drawn from the 20 novels in my sample. It will put these techniques in conversation with STS work in epistemology and the sociology of scientific knowledge, drawing parallels and contrasts to the ways that scientists establish facts about the world. This chapter shows that, even at the level of prose, speculative fiction cannot escape the politics of technoscience.

Chapter 4 provides a discourse analysis of online reviews of these 20 novels.[17] This analysis gives special focus to issues of realism, rigor, empiricism, and objectivity, as well as the ways that reviewers consider the relationship between the author, the text, and the larger genre community where applicable.

Chapter 5 provides a similar analysis of statements made by authors in pre-existing interviews. It provides illustrations of authors' narratives surrounding genre and boundary-work,

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interviews, Connie Willis's *Blackout* and *All Clear* are considered together, as they were for the Hugo Award nomination. Additionally, James S.A. Corey will be referred to as a single author when discussing authorial choices (mainly in the textual analysis and review analysis chapters) but both authors comprising the pen name (Daniel Abraham and Ty Franck) will be referred to separately when interviewed separately.

[17] For the purposes of the review analysis, only reviews of Connie Willis's *Blackout* (and not *All Clear*) were considered to avoid overrepresentation in the sample. There are certainly drawbacks to only considering *Blackout*, as I will discuss at length in the appropriate chapter.

with a particular emphasis on instances where the four scientific norms I have identified were misapplied with inequitable results.

Finally, in the conclusion, I discuss the larger implications of this project and potential for future work.

Chapter 2: The Politics of SF

Politics have arguably been at the forefront of many SF fans' minds since at least 2013, when the first rumblings of a dispute over the Hugo Awards began.[18]

The Hugo Awards, associated with the annual World Science Fiction Convention (WorldCon), have been among the most prestigious awards in SF since being first awarded in 1955 (Larbalestier 2002: 255). The Hugos are widely accepted to represent fan taste, as anyone who pays a supporting membership fee for WorldCon may vote. This is in contrast to other awards that are either juried or have restrictions on eligibility for nominating or voting, such as the Nebula Awards, voted on by members of the Science Fiction Writers of America (256).

Awards have been used as a means of contesting the boundaries of SF since at least the founding of the James Tiptree Jr. Memorial Award in 1991,[19] which was created to combat the image of SF as exclusionary and male-dominated (see chapter 7 of Larbalestier for a more complete accounting of the awards). In a similar vein, the Carl Brandon Society issues awards for writers of color and works that deal with race and ethnicity (Merrick 2009: 261-62). While both the Brandon and Tiptree Awards are juried awards, however, the Hugo is not. As English discusses in *The Economy of Prestige*, juried prizes assign power to the institutions that control the prize to therefore control (or, as he notes, attempt to control) the cultural economy within the field (English 2005: 51). The Hugo Awards' democratic voting processes (or, at the very least,

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[18] Surprisingly for the community, there does not seem to be a single agreed-upon term for this incident, although I have seen "Puppygate" used.
[19] As of October 13th, 2019, the Tiptree Award is now the Otherwise Award. As it is mostly discussed here in its historical context, I will continue to refer to it in this dissertation as the Tiptree Award.

more democratic than a juried award) provide an even more expansive field in which battles over the cultural economy and, indeed, the very definition of SF may play out.

Initially a group called the Sad Puppies formed to contest the nomination of certain works, with their first attempt to secure a nomination for one of the organizer's works. The Puppies themselves varied in their political stances from relatively mild self-promotion positioned against left-wing bias (such as Larry Correia) to active "opposition to suffrage, homosexuality, and racial diversity" (Theodore Beale/Vox Day, who was also involved in Gamergate; see Oleszczuk (2017: 129)). One argument made by the leaders of the various groups of Puppies was that the focus on "boring message lit fic" was pulling the genre (or at least the awards) away from what fans *truly* wanted, harkening back to previous halcyon days of SF. This will be discussed in more detail in this chapter; however, for now I will simply say that the perception of these previous ages of SF inevitably invoke both visions of an overwhelmingly white male community and a deep tie to and appreciation of the role of science in SF.

By 2015, this escalated with the formation of the Rabid Puppies, an offshoot group put together by unapologetic misogynist and white supremacist Beale. The Rabid Puppies engaged in slate voting by coordinating their nominations, since at the time anyone could submit nominations for the Hugos, and as a result multiple categories were not awarded.[20] A similar situation played out in 2016, but by 2017 the nomination process was changed to dilute the impact of slate voting.

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[20] That is to say, since the nominations in those categories were all Puppies nominations, voters affirmatively voted for "No Award." The Puppies were not able to slate-vote for the award as easily, since voting required a membership in WorldCon and those, unlike nominations, cost money.

Nevertheless, the events left the community in a state of upheaval, and some fans, myself included, would argue that the community has yet to truly recover. The memory of the Puppies has no doubt been made even more durable by the ongoing importance of the alt-right in at least American culture, as both GamerGate and the Puppies debacle have been acknowledged as precursors to tactics men's rights activists the alt-right would later adopt (Felapton 2021).

There is certainly much more about the Puppies that can be unpacked--indeed, in 2021 a fan published a fairly exhaustive account of the Puppies that runs nearly 500 pages (the Debarkle, cited as Felapton above), which author John Scalzi nevertheless noted was "well-sourced but somewhat scattershot" (Scalzi 2021). Yet as I will show in this chapter, the issues that came to a boil in the Puppies have been present culturally in SF since the genre's inception, and in this project I hope to show some of the subtextual cultural dynamics that perhaps led the Puppies to think that SF would provide their rhetoric with fertile ground.

Cultural Context of the History of SF

A greatly abbreviated history of science fiction literature can be split into eras or artistic movements.[21] Critics may argue different points of origin of science fiction, frequently clustering around several loci: Mary Shelley's *Frankenstein*, the works of Jules Verne, and the works of H.G. Wells. As illustrated by Joseph Norman's "An Annotated Science Fiction Timeline" in Hubble and Mousoutzanis's *The Science Fiction Handbook*, the pedigree of the genre can stretch back as far as More's *Utopia*, Kepler's *Somnium*, and Swift's *Gulliver's Travels* (Hubble and

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[21] I use the term "science fiction" as opposed to "speculative fiction" deliberately here, as I am referring to texts that do the same and largely do not address other genres or subgenres within the SF umbrella, such as fantasy.

Mousoutzanis 2013). Some, such as Donawerth, note the importance of feminist utopias as well (Donawerth 1997: 5).

For the purposes of this dissertation, with its contemporary focus, I will begin instead with what is referred to as the pulp era of science fiction, when stories were published (or novels were serialized) in pulp magazines. This practice dates back to the late 1800s (Roberts 2016: 256), but in colloquial usage I have heard "pulp-era science fiction" more frequently refer to pulp science fiction published after editor Hugo Gernsback founded *Amazing Stories* in 1926; I will shortly return to Gernsback's importance, both as an editor and as a mythological figure. The end of the pulp era is typically ascribed to John W. Campbell's editorial leadership of the genre in the 1940s and 1950s, called the Golden Age of science fiction (Roberts 2016: 287). Campbell, as an editor, both refined science fiction's interaction with science and expanded its theorizing to the social sciences (as he worked with Isaac Asimov to develop the concept of psychohistory key to the latter's Foundation series). As Nevala-Lee states, "Campbell had wanted to be an inventor or scientist, and when he found himself working as an editor instead, he redefined the pulps as a laboratory of ideas" (Nevala-Lee 2018: 8). Roberts highlights Isaac Asimov and Robert Heinlein (at least, his early works) as characteristic authors of the Golden Age, and he notes: "Coined by a partisan fandom, the phrase valorises [sic] a particular sort of writing: hard SF, linear narratives, heroes solving problems or countering threats in a space-operatic or a technological-adventure idiom" (287).

Roberts identifies the period after the Golden Age as being marked by the burgeoning presence of New Wave, "a loose affiliation of writers from the 1960s and 1970s who, in one way or another, reacted against the conventions of traditional SF to produce avant-garde, radical or fractured science fictions" (Roberts 2016: 334). This era also saw the introduction of several

notable women authors and authors of color (such as Ursula K. Le Guin and Samuel Delany), as well as an increased focus on "soft science fiction" informed by the social sciences; the combination of these two factors led "most critics [to] locate the new maturity of the genre and the 'arrival' (again) of women writers and readers" in the 1960s (Merrick 2009: 44). The 1980s saw the rise of cyberpunk as well as a resurgence of hard SF, not infrequently associated with right-wing values; this continued into the 1990s. I will end my summary of the history of SF there, as the 2000s mark both the early end of the publication period of histories I consulted and a period that I find too recent to usefully historicize.

Despite the disputed origin of SF, there is some utility for this project in particular (in that it examines the ties between SF and technoscience) in focusing briefly on a particular figure and a particular origin.

Editor Hugo Gernsback, often hailed as the father of SF (Larbalestier 2002: 15), tied the facticity or plausibility of the stories he published to their entertainment value (Cheng 2012: 93). He employed strategies such as the inclusion of a scientific editorial board and science questionnaires whose answers could be found in the stories (ibid. 102 and 92 respectively); Cheng also discusses the importance of scientific facts as black-boxed sources of authority in the pulp era. This era arguably set the stage for speculative fiction as it continues to exist, as prominent SF critic Gary Westfahl notes that "since Gernsback played such a key role in establishing public awareness of the genre, his ideas about science fiction dominated all commentaries on the subject and have remained influential to this day" (Westfahl 1996: 5). In its purest form, the link between science and SF endures in the subgenre "hard science fiction,"

which Westfahl describes in mythological terms as being "dedicated to cold, objective scientific reality and the denial of outmoded humanistic aspirations" (Westfahl 1996: 111).[22]

Histories and Historiographies

This mythology of SF is of particular interest to this project. In particular, many histories of the genre characterize it as dominated by white male writers until roughly the 1960s and 70s, when "soft science fiction" came into prominence (see Larbalestier (2002: 163-72)). Yet, as Larbalestier among other scholars note (such as (Merrick 2009; Davin 2006; Yaszek 2008; Donawerth 1997; Roberts 1993; Bacon-Smith 2000)), women have been writing in SF since the pulp era. These scholars, often writing in explicit "recovery projects," show that somehow the history of SF has been distorted, whether deliberately or accidentally, to omit women writers as well as women's participation in the fan community (for example, as convention attendees).[23]

While I have been unable to find similar recovery projects tracing the activities of writers and fans of color, scholars have long studied the role of race in works. For example, Lavender (2011), Rieder (2008), and Cheng (2012) study the racialization of aliens and the Other in SF. Additionally, Samuel Delany points out that he is often identified as the first African-American SF writer despite the existence of proto-science fiction by other Black authors and, indeed, the existence of many pulp writers who were never seen in person or photographed and could easily have been other than white men (Delany 1999: 383-84).[24] Yet I find that the invisibility of

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[22] Westfahl is explicit that this is the view taken by those who view themselves as the defenders of the subgenre, and it is a description which Westfahl has, prior to this quote, spent 110 pages painstakingly dissecting. Yet this mythological view is still circulated and holds substantial weight, which is why I use it here.

[23] See Bacon-Smith 2000 Chapter Five, "The Women Were Always Here: The Obligatory History Lesson" (95-107).

[24] There is precedent: James Tiptree, Jr., was famously revealed to be Alice Sheldon after conducting a long and storied career under a man's name. Indeed, Tiptree was praised for "his" masculine style in particular. For an in-

authors of color in this period is telling; it indicates that the ones who likely existed in this period

felt, for some reason, that they could only exist separate from their racial identities. While this

may not be due to factors unique to or deliberately put into SF, it is nevertheless difficult to

imagine that the absence of visibility for authors of color is a coincidence.[25]

Fan Cultures and the Authority of Science and Authors

This erasure, I argue, stems from a projection of the imaginary of white

technomasculinity back onto the history of speculative fiction. Though this project is not a

historical or archival one, this context of the reinterpretation of history to fit a contemporary

sociotechnical imaginary is vital to understanding the current dynamics of the SF community in

which there are those who aim to return to a (white, masculine, unadulterated by Social Justice

Warriors--i.e., *unmarked*) past.

This view of SF's history may be influenced by a historical gap between SF literature fans

(including writers, congoers, and so on) and SF media fans, or those who were initially attracted

to SF through visual media such as *Star Wars* or *Star Trek*. This divide, too, is heavily gendered,

both in terms of community makeup and fan practices (see Jenkins (1992: 48)), and it may well

be a compounding factor that these media works entered popular culture roughly

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depth examination of Tiptree's career and the gender-bending award that was named for "him," see chapters 6 and 7 in Larbalestier. In the opposite direction, Merrick notes the existence of two "hoax" fans, Joan W. Carr, a supposedly female fan, and Carl Brandon, a supposedly black fan; see Merrick 90-93.

[25] Here I disagree substantially with Davin (2006), who notes a preponderance of stories in favor of racial equality in early SF. While agree with him that these stories existed, I disagree that their existence indicates a lack of racism or equates to a substantially antiracist environment in SF at the time; indeed, I find Davin's attitude reflective of a phenomenon noted by Seymour and Hewitt wherein white STEM students "did not understand the distinction between prejudice and discrimination and suggested that if no discriminatory acts were committed, then there was no prejudice" (Seymour and Hewitt, 366). I read Davin's argument as a similar one: that because he found little overt discrimination in SF, there could be no prejudice. To say the least, I do not find this logic compelling.

contemporaneously with second-wave feminism, as noted in Mueller (2017: 56).[26] Fans of media

SF have since been referred to as "media fandom" or, based on many of their fan practices,

"transformative fandom," as media fandom is where activities such as the production and

distribution of fanfiction, fanzines, fanart, and fanvids flourished. As these works were not

infrequently erotic (and not infrequently queer), media fandoms often maintained a strained, if

not actively antagonistic, relationship with the producers of the original works. Indeed, Jenkins,

while discussing Lucasfilm's legal threats to fanzine editors who published erotic content, notes

that some fans viewed their activities--particularly the ones that made content producers

uncomfortable--as actively antipatriarchal, aligning Lucasfilm's creative intent with masculine

dominance (Jenkins 1992: 31).

There is additional evidence to suggest that, discursively, the perceived opposition of

correct fan practices, i.e. ones that position the author as the primary or even sole authority over

a text, as masculine and incorrect fan practices, i.e. transformative ones, as feminine may be

widespread (Busse 2013). Indeed, it is not uncommon for fans to use transformative practices to

deliberately reinterpret texts to explicitly criticize them, particularly the texts' treatments of

gender and race. Although this criticism is certainly aligned with scholarly criticism on the same

subjects, these transformative works frequently foreground the affective response to the initial

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[26] However, Mueller also notes that even the *existence* of a divide within the SF community was repugnant to many SF fans, who saw shared identity and communitarianism as among the highest goods; she illustrates this in her case study of the so-called "Second Great Exclusion," also known as the "Breendoggle," in which, among other events, Walter Breen was controversially banned from the 1964 WorldCon due to multiple substantial allegations of child molestation. Some viewed this decision as excessively exclusionary and took issue with how the decision was made, as the Worldcon committee did not consult with the community before unilaterally issuing their decision. The problem for some, then, was less the decision itself and more the failure of the SF community to come to consensus and act together. For more details, see (Mueller 2017: 47-54).

texts; for example, when fanvidder Luminosity edited footage of Frank Miller's film *300* to Madonna's "Vogue" to critique its hypermasculinity and heteronormativity, the subtitle was "Bite me, Frank Miller." (Cupitt 2008)

This illustrates an odd paradox of the ways transformative fandom considers authors. On the one hand, Luminosity holds Frank Miller accountable for the content of his work, and her response is directed *at* him; yet by the very practice of remixing his film, Miller is stripped of his authority over its message. Similarly, the summary for "How Much Is That Geisha in the Window?", a Firefly fanvid critiquing the show's orientalism and lack of actual Asian representation, says in its summary: "Fuck you, Joss, you racist asshole." (clfront 2008) Again, Joss Whedon (the executive producer and showrunner on Firefly) is held responsible for his work while his intent as its creator is minimized.

In contrast, literary fandom has valorized the singular authority of science since the days of Hugo Gernsback. Cheng's discussion of pulp magazines and letter pages shows how scientific facts were often framed as the point of Gernsback's "scientifiction," from factual scientific quizzes to scientific Q&A columns included in his magazine, and Cheng describes debates in letter pages over specific black-boxed scientific facts (Cheng 2012: 92-98). Calling on Latour, Cheng further tied this to the legitimacy of science, observing that science acted as "a general authority independent of individual opinion and able to adjudicate the claims of readers, writers, and editors alike. Under its aegis readers could equally present their views to be considered, and whether they were right or wrong, each was entitled to a judgment under the authority of science." (Cheng 2012: 99) Cheng expands:

Science fiction stories and conversations accepted scientific claims as much as they debated them, keeping many of their "black box" assertions closed. Even when readers

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criticized writers' or each other's use of facts, those criticisms were corrections and

clarification of accepted knowledge, not challenges to their larger paradigms or

conceptual frameworks. If they challenged experts, they did not necessarily challenge

expertise. Science's authority remained above their social engagement. (Cheng 2012:

106)

It is worth noting that the view of scientific expertise as unassailable is consistent with

the roughly contemporaneous work in the philosophy of science, particularly logical positivism

and Karl Popper's drive to demarcate science. The relevant features are, particularly, the

privileging of scientific knowledge over other forms of knowledge, a belief in scientific progress,

scientific realism, and human intervention in gathering knowledge as only either getting closer to

or further from an objective scientific truth (Popper 1965).[27] This, of course, sparked further

responses from feminist scholars such as Haraway and Longino, which I described in "Gender,

Race, and Technoscience" in Chapter 1; but it is worth noting that these feminist critiques of

those early philosophies of science align the concept of objectivity with Olson and Labuski's

white technomasculinity.

Additionally, this valorization of scientific facts was coupled with an adoption of values

of neutrality and objectivity, values which are often associated with technoscience. Mueller

describes several early controversies in the SF community focusing on whether the SF

community ought to adopt political stances. In the 1939 Great Exclusion, a group of fans known

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[27] While there is certainly much that can be said--and has been said--about logical positivism and Karl Popper, I
leave my discussion here in the interests of brevity.

as the Futurians were banned from the first WorldCon out of concern that they would attempt to

politicize SF fandom and recruit fans--and, indeed, the genre as a whole--to progressive political

causes. This was seen by some as "a betrayal of the science-fiction fandom's core values,

namely, the ideals of objective technological progress and science" (Mueller 2017: 39). This

debate became relevant again in what became called the Second Great Exclusion, or the

Breendoggle, in which high-profile fan Walter Breen was banned from the 1964 WorldCon after

accusations arose that he had repeatedly molested children. Although the Second Great

Exclusion is arguably a much messier topic to summarize than the 1939 incident for a multitude

of reasons, including the obvious legal implications, once again issues of whether and how SF

fandom could or should take political stances became highly relevant. Additionally at issue was

who had authority over fannish spaces, including WorldCon; much of the backlash against

Breen's ban was aimed at the convention organization committee (concom) for failing to solicit

or consider input from fans before making their decision and for excessively politicizing the

question of whether one could gain entry into fandom (Mueller 2017). Science fiction, the

argument ran, should remain objective and separate from messy social issues such as ethics and,

ironically, gatekeeping.

    With these examples,[28] then, an additional dimension of Faulkner's technical/social

binary emerges, in which certain fan practices become aligned with other values in fandom. The

"technical" side of the binary has science, facts, objectivity, freedom from politics, and an

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[28] The SF community provides a rich and frankly unending source of documentation, and so there are many other notable incidents in fan history that I could relate, particularly with respect to issues of gender, race, and difference; for the purposes of brevity, I will not go into detail here into, for example, RaceFail.

unquestioned authority of the author; the "social" side has social commentary, subjectivity, political stances, and transformative works that frequently speak back to the author. And, of course, the "technical" side of the binary is most easily achieved by those belonging to unmarked categories (such as white men), while the "social" side is difficult to escape for those whose identities are marked (such as people of color and fangirls). This, then, is an area where the identity of the author becomes immensely important. The Puppies' use of the rhetoric of "SJW" authors shows that it was not only specific works that they targeted, but specific *authors*; and as we will see in Chapter Four, the conflation of the textual qualities of a specific work with the artistic choices of a specific author is not infrequent in speculative fiction. Thus, I argue, issues of race and gender in speculative fiction cannot be accounted for solely by analyzing the texts themselves.

It is worth noting that there are signs that fan studies is beginning to more seriously grapple with the role of producers. While some studies focus on specific fan reactions to specific artistic choices by producers, including those outside the text (such as Ng's 2017 paper examining the texts, paratexts, and queer contexts of queerbaiting in several major media fandoms), Busse notes that "contemporary readers may dismiss authorial intentions but nevertheless rely on authorial identity in their readings of public utterances" (Busse 2017: 20). Busse's work expands Foucault's author function to reach a place in which "the author becomes important again, not in a vacuum but as a historical, political, national, social, gendered, and sexed being who writes and is read within particular contexts and against specific historicopolitical and socioeconomic events" (Busse 2017: 28). The author's identity, Busse argues, and potential insider status (especially in marginalized groups) may signal to readers the positionality and power dynamics from which it emerged. Busse uses the example of the July

2008 cover of the *New Yorker*, in which Michelle and Barack Obama were depicted in terms of the various conservative stereotypes applied to them; yet as the artist was not a member of the communities invoked in the stereotypes, the cover was received as racist.

Although Busse does not discuss Stanley Fish's notion of interpretive communities until later in the chapter, this incident could also be analyzed through that lens. Interpretive communities, according to Fish, are communities of readers (or, in a wider sense, consumers of a text) that share strategies of interpretation that constitute the meanings of texts. The *New Yorker* cover drew criticism because both the artist and the machinery of publication behind him were embedded in an interpretive community in which the only valid strategy of interpretation for the cartoon was that it was satirical. Yet for communities harmed by the stereotypes that the cartoon played with, the potential of a straight reading was very real, and the fact that this had not been considered perpetuated harm.

We can see another example specifically from SF of the conflict that the encounters between interpretive communities can trigger in Camille Bacon-Smith's *Enterprising Women* (Bacon-Smith 1992). She discusses a licensed Star Trek novel written by an author who was well-known for writing homoerotic Star Trek fanfiction and which contained language that invoked the tropes of that genre, even though the novel itself contained no explicit romantic or sexual material. Nevertheless, after an outcry, the publishers released a revised version that omitted the offending sections. Though on their own the phrases were unremarkable and innocuous--such as references to Kirk's "hazel eyes"--since the readers were aware of the author's past fanfiction, they were primed to employ the interpretive strategies of that genre. Since the trope of narration explicitly commenting on the color of a character's eyes is known to be a prelude to an in-text sexual encounter, the readers interpreted it as such here, even though

no such encounter occurred nor was implied to occur in the text itself. The incorporation of this phrase associated with fanfiction affected the relationship readers had with the text itself, recategorizing the text from tie-in literature to erotic fanfiction--a genre which, as discussed above, carries a feminine and negative connotation. To take another example, the Puppies' stance towards works authored by women and people to color implies a set of interpretive strategies that constructed diverse representation and overtly liberal political messaging as mutually exclusive with the traditional view of quality in SF. The proliferation and celebration of these works, furthermore, were interpreted as an invasion of a genre that the Puppies used to construct their own identities (see the next section for more on the relationship between fan community and identity), thus threatening their ownership of the genre and the aforementioned identities.

An additional dimension worth noting, particularly given the Puppies' implicit and explicit orientation to masculinity, is that the focus on the Hugo Awards aligns with dynamics that Kate Manne has identified as misogynistic. The loss of "social positions of leadership, authority, influence, money, and other forms of power, as well as social status, prestige, rank, and the markers thereof," which are traditionally masculine-coded perks, the loss of which commonly triggers misogynistic responses (Manne 2017: 115).

Importance of Community in SF

Given the lack of consensus on so many issues fundamental to SF (including, for example, what SF is), it is notable that there is one topic on which most critical work agrees: the importance of community to the genre. This has been historically true for the industry, where

new authors regularly emerged from the ranks of fandom, although Larbalastier casts doubt on whether it continues to hold true (Larbalestier 2002: 6).[29] As Huntington (1989) notes:

> The frequent conventions are gatherings of both [readers and authors], and at them fans are honored as well as writers. In the thirties and forties most of the young writers were avid fans, and many writers later became editors of magazines or of anthologies--just a partial list of these writer-editors would include Brian Aldiss, Isaac Asimov, Ben Bova, John W. Campbell, Samuel Delaney, Lester del Rey, Harlan Ellison, Hugo Gernsback, James Gunn, Damon Knight, Judith Merril, Michael Moorcock, Frederick Pohl, Pamela Sargent, Robert Sheckley, Robert Silverberg, and Norman Spinrad. This sort of incestuous relation among fans, writers, and editors is unique among the popular genres. (3)

This sentiment is repeated in many histories and discussions of SF, to the point where it is frequently taken as a given (Bacon-Smith 2000: 3; James 1994: 130; Carrington 2016: 9). As Cheng notes, the collective character of the SF community dates back to the pulps of the 1920s and 30s. Gernsback deliberately fostered a sense of community among his readers through the letters pages, in which readers could write in to hold conversations with not only other readers, but also writers, editors, and other members of the burgeoning SF community. Indeed, this leveled playing field was recognized as unique at the time:

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[29] At least, as of 2002; while a thorough exploration of this question is beyond the scope of this dissertation, I find it worth noting that a high proportion of contemporary Hugo nominees and awardees have stated publicly that they began writing in media fandom (such as N.K. Jemisin, Brooke Bolander, Naomi Novik, Seanan McGuire/Mira Grant, and Sarah Rees Brennan).

"Remember, science fiction is one of the few places in popular fiction, perhaps the only

one," P. Schuyler Miller of Scotia, New York, reminded other readers, "where reader and

writer are on a par and can fight it out, man to man, possible vs. impossible." (qtd. in

Cheng, 60)

Cheng further identifies these letters pages as the beginning of a participatory culture for

SF (Cheng 2012: 77). Attebery goes a step further, arguing that fans "did not object to the

formularization of SF, but they did, in collusion with sympathetic editors like Gernsback, make

the formula less interchangeable with other forms of adventure fiction by demanding that the

scientific content be both valid and essential to the plot." (Attebery 2002: 40) This quote shows

the deep tie between the conception of SF *as a genre* and SF *as a community*; while the genre

defined the fandom, so too did fans define the genre.

And there was a not inconsiderable proportion of fans who, indeed, defined themselves

and their identities according to SF. Being a fan was, for at least a time, taken up by some fans as

a sign of superiority in their difference. After A.E. van Vogt's *Slan*, a novel about a race of the

titular telepathic evolutionary step after humans, was released, some fans began to assert that the

fan identity was itself superior to others under the rallying cry "Fans are slans." Slans, the

persecuted and misunderstood heroes of the novel, displayed superior intelligence and telepathic

abilities, and in aligning themselves with the slans, these fans declared their own superiority as

well (Larbalestier 2002: 35).

Two other phrases capture the fervent attention that many fans paid to SF, as well as the

pushback against such devotion: fiawol and fijagh. As Del Rey explains,

Fiawol (Fandom is a Way of Life) expresses the attitude of the devoted fan who just

seems to eat, breathe and sleep for nothing but the one subject. Fijagh (Fandom Is Just A

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Goddamned Hobby) is the moderate stand of one who can enjoy without making a career

of his [sic] hobby. Both attitudes in such capsule form are described somewhat tongue-in-

cheek, but there's a good deal of serious intent behind them. (Del Rey 1980: 207)

I provide this evidence to bolster a key point: A holistic view of SF must address the

social dynamics behind the genre. Both authors and readers are socialized by the expectations of

a larger community in their production and consumption of texts, to an extent that may very well

be unique to SF. Such a reciprocal relationship between people and texts was one of the key

goals of Gernsback as he founded his magazines, and though it has certainly morphed over the

years (see the previous section of fan cultures), it remains to this day.

This reciprocal relationship is of key interest to this project. Solely investigating the

literary techniques that authors employ in their texts would lose both the larger context of how

those texts operate socially and how the social forces of SF operate on those texts. This social

boundary-work, I argue, relies on and simultaneously constructs the authority of technoscience in

this informal space.

Prizes and the Hugos

Helen Young identifies three main awards in SF: the Hugos, Nebulas, and World Fantasy

Awards. Each of these awards has a slightly different purpose, as she describes:

The different awarding bodies of the three mean that combined they represent multiple

sections of the genre-culture: the Hugos are voted on by members of the annual World

Science Fiction Convention; the Nebulas by the members of the Science Fiction and

Fantasy Writers of America; and the world Fantasy Awards by a small panel usually

composed of authors, editors, and academics, and despite its name it is not exclusively

for genre fiction. (Young 2015a)

Membership in the World Science Fiction Convention (hereafter WorldCon) is open to all, and attendance at the Con itself is not required. "Supporting memberships" exist to allow anyone who purchases one to vote in the Hugo Awards, as well as gain access to a voter package of the nominated works whose publishers have agreed to provide them. As Jenkins notes, "Fan awards, such as the Hugo [...] play a key role in building the reputations of emerging writers and in recognizing outstanding accomplishment by established figures." (p 47)

It would be inaccurate to say that the Hugo Awards represent the entire will of SF fandom. Clute and Nichols noted in their *Encyclopedia of Science Fiction* in 1993 that

> The Hugos have for many years been subject to criticism on the grounds that awards made by a small, self-selected group of hardcore fans do not necessarily reflect either literary merit or the preferences of the sf [sic] reading public generally; hardcore fandom probably makes up less than 1 per cent of the general sf readership. Certainly Hugos have tended to be given to traditional Hard SF, and have seldom been awarded to experimental work, but they have been, on the whole, surprisingly eclectic. [...] Nevertheless, despite all the criticisms to which both [the Hugo and Nebula] are readily subject, they are of real value to their recipients in increasing book sales. (Nichols and Clute 1979: 596)[30]

Additionally, as the disputes surrounding recent Hugo Awards show, the awards continue to have at least enough meaning to fans to create considerable controversy. This is perhaps unsurprising, as prizes are often a mark of institutionalization and legitimacy. In his history of

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[30] The portion of this quote that was omitted in the interests of brevity interrogates this image of the Hugo Awards as preferring hard SF by noting the experimental and genre-defying works that have won; thus the eclecticism may not be so surprising after all, and judging by the 2010 win of China Miéville's *The City & The City*, it continues past the 1992 publication of the *Encyclopedia*.

prizes, English ties prizes to "a claim to authority and an assertion of that authority--the authority, at bottom, to produce cultural value." (English 2005: 51) This cultural authority was leaned on explicitly by the founders of the James Tiptree Jr. Award (now the Otherwise Award), a juried award bestowed upon SF works that play with gender roles:

> A few months ago, I was talking with Richard Kadrey, a born trouble-maker. We were talking about women in science fiction and Richard, just to make trouble, said, "You know what would really piss people off? You ought to give out a women's science fiction award." Interesting idea. It would make certain people very cranky. It would get the conspiracy theorists going, wondering, "What are those women up to now?" We envisioned a little plexiglass tube with all this "women's stuff" floating in it: little plastic babies and cooking pots and ironing boards and sewing machines. (Murphy [1991] 1992: 8-9, qtd. in Larbalastier 2002, 204)

Indeed, this quote, like so much about the Tiptree Award,[31] illustrates the juxtaposition between the cultural (and masculine-coded) authority of prizes and the perceived and expected role of women in society. The above quote originates from a speech given by Pat Murphy at WisCon, and the published version of it that Larbalestier cites appears in *The Bakery Men Don't See*, a cookbook of baked goods published in support of both WisCon and the Tiptree Award; this cookbook and its companion, *Her Smoke Rose Up From Supper*, are both celebrations of the irony that birthed the Tiptree Award, which is funded by bake sales. The inauguration of the

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[31] As in earlier sections, I refer to the Otherwise Award as the Tiptree Award when accurate to the period being referenced, i.e. before 2019.

Tiptree Awards shows an awareness within science fiction of the power of awards in general, in this particular case invoked deliberately to draw attention to gender in SF.

And while there is no doubt that the Hugos have become SF's most *notorious* award in recent years, an argument can be made for its overall importance. Author (and Hugo winner) Jo Walton began a series of essays revisiting the historical nominees and winners of the Hugos, which eventually became a book, *An Informal History of the Hugos*. While it's entirely legitimate to argue that a book like that might be slightly inclined to inflate the importance of its main topic, Walton still takes the time in her introduction to position the Hugo Awards as follows:

> They're science fiction's most important award--and they're entirely fan voted and fan administered. I care about them passionately, not just as a writer but also as a fan. I have voted for them every time I've gone to a Worldcon and therefore been entitled to vote. There's no financial prize, but I've been told that it's the only genre award that actually affects the sales of a book. (Walton 2018: 6).

The Archive for This Project

For this dissertation, I examined the texts, reviews, and author interviews concerning twenty novels that had been nominated for the Hugo Award for Best Novel between 2008-2012 (and therefore published between 2007-2011). I chose nominees because they offered a unique opportunity to examine the texts that were collectively deemed to be prestigious by the SF community. I chose novels because there are simply more reviews of novels than there are of short stories, since Goodreads does not allow reviews of short fiction and Amazon reviews are based on whole published editions. The years were chosen to immediately precede the beginning of the Puppies debacle, since Larry Correia's first attempt to corral the Sad Puppies took place in 2013 (Oleszczuk 2017). These five award years contained 27 nominees; however, removing one

of the novels for each of the six authors who were nominated twice in that period yielded a sample of 21 and two novels were jointly nominated (Connie Willis's *Blackout*/*All Clear*), leading to a final sample of 20. These novels are listed in Table 1, with redundant novels that were not consulted grayed out.

Table 1

Book	Author	Hugo Year
Brasyl	Ian McDonald	2008
Halting State	Charles Stross	2008
Rollback	Robert J. Sawyer	2008
The Lost Colony	John Scalzi	2008
Yiddish Policemen's Union	Michael Chabon	2008
Anathem	Neal Stephenson	2009
Graveyard Book	Neil Gaiman	2009
Little Brother	Cory Doctorow	2009
Saturn's Children	Charles Stross	2009
Zoe's Tale	John Scalzi	2009
Boneshaker	Cherie Priest	2010
Julian Comstock	Robert Charles Wilson	2010
Palimpsest	Catherynne M. Valente	2010
The City & The City	China Mieville	2010
Wake	Robert J. Sawyer	2010
Windup Girl	Paolo Bacigalupi	2010
Blackout[32]	Connie Willis	2011
Cryoburn	Lois McMaster Bujold	2011
Feed	Mira Grant	2011
Hundred Thousand Kingdoms	N. K. Jemisin	2011
The Dervish House	Ian McDonald	2011
A Dance with Dragons	George R. R. Martin	2012
Among Others	Jo Walton	2012
Deadline	Mira Grant	2012
Embassytown	China Mieville	2012
Leviathan Wakes	James S. A. Corey	2012

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[32] Technically, *Blackout* was nominated jointly with its sequel, *All Clear*, as they were initially intended to be a single book. However, for the purposes of this project, I only analyzed the reviews for *Blackout*.

Chapter Three: Exposition, Epistemology, and Genre

Exposition in the Wild

The ways to provide exposition in a text are a topic of much discussion among authors, and it is this perspective--looking at writing techniques as tools that authors may deploy for specific purposes--that informs my analysis. This is for two reasons: First, my main exposure to the concept of exposition has been in the context of writer's workshops. Second, the bulk of discussions of exposition in non-narratological terms seems to occur among writers providing essays in community or trade publications (Card 2014; Elliott 2013; Kress 1998, 2006; Lovett 2011; Ng 2019; Tan 2017).

Drawing on these discussions and my close readings of the texts, I propose eight techniques deployed by authors in creating exposition. These are the ways that authors lend credence to their speculations and legitimate these claims that are untrue in the world of the reader, but true in the speculative world. In this chapter, I will be mainly drawing parallels between the techniques of exposition and the ways that scientific knowledge claims circulate and gain legitimacy in Western technoscience. Various approaches to studying knowledge creation and circulation have shown that the transmission of knowledge is not innocent of power structures or social relations, and the techniques I describe here extend those analyses to speculative knowledge as well.The techniques of exposition that I identified are:

Table 2

Technique	Description
Temporality	A break in the temporal flow of a narrative to deliver exposition
Focus	A deep level of detail used to describe or analyze a new concept
Register	A shift in the narration to an external source that is posited to exist within the universe of the narrative

Didactic Tone	An explanation provided, either in-character or by the narration, for the express purpose of teaching
Characters' Knowledge	Information conveyed to the reader through the filter of a character's knowledge, particularly the point-of-view character
Dialogue	One character tells another character information that is, coincidentally, passed on to the reader
Seeing In-Use	The use of specifically-curated details in narration to lead the reader to draw conclusions without the narration or a character explicitly saying that information
Extradiegesis	Supplementary materials that do not exist within the world of the narrative, such as Author's Notes, Notes to the Reader, and so on

As I will show, these techniques show how the authority of science lends its legitimacy beyond the confines of what is traditionally included in technoscience. There are not always material technological artifacts or specific scientific facts being referenced in speculative fiction, yet many of the techniques of exposition rely on the same techniques used by technoscience to assume epistemological authority.

Techniques of Exposition

Seeing-In-Use, Temporality, and Characters' Knowledge : The Construction of Facts

First, I will discuss three techniques together: seeing-in-use, filtering information through characters' own knowledge, and the manipulation of temporality.

Seeing-in-use refers to circumstances where information is conveyed to the reader without exposition, but simply by providing descriptions of actions or events in such a way that the reader is left to link together cause and effect. This may be for stylistic reasons (such as Hemingway-esque prose; see Chapter Five for a longer discussion of style) or the narrator's ignorance; it may also be employed to show that such knowledge is so common for the narrator that it does not occur to them to go into more detail. This is the case in Mieville's *Embassytown*, where Avice's first-person narration never explicitly says that the atmosphere breathed by the

alien Hosts is toxic to humans, or even that the Hosts are not human. Instead, Avice describes the

games that local children play of holding their breath while venturing into Host areas and shows

the consequences of one unlucky child who became poisoned from breathing there:

> Of course we would try to enter the Host city, where the streets changed their looks, and
>
> brick, cement, or plasm walls surrendered to other more lively materials. [...] I'd hold my
>
> breath and go forward on a lungful through where the airs mixed--past what was not quite
>
> a hard border but was still remarkably abrupt a gaseous transition, breezes sculpted with
>
> nanotech particle-machines and consummate atmosphere artistry--to write *Avice* on the
>
> white wood...I ran back, gasping, to my friends. (Miéville, 10)

This section leads the reader to conclusions without providing them by showing Avice

reacting to the circumstances that the reader is not explicitly told. The "gaseous transition" where

"airs mixed" that require Avice to "hold [her] breath and go forward on a lungful"--none of these

state that the Hosts breathe gasses that are toxic to humans, but that is the reasonable cause for

the effects that are seen.

> Furthermore, another anecdote a few pages later reinforces this inference:
>
> Yohn was the second-best southgoer in our group. He couldn't compete with Simmon, the
>
> best of all, but Yohn could write his name on the picket fence several slats farther than I.
>
> Over some weeks I'd strained to hold my breath longer and longer, and my marks had
>
> been creeping closer to his. So he must have been secretly practicing. He'd run too far
>
> from the breath of the aeoli. I could imagine him gasping, letting his mouth open and
>
> sucking in air with the sour bite of the interzone, trying to go back but stumbling with the
>
> toxins, the lack of clean oxygen. He might have been down, unconscious, breathing that
>
> nasty stew for minutes. (Miéville, 12-13)

This provides the clearest explanation of the problem with the Hosts' atmosphere, citing its "toxins" and "lack of clean oxygen." Additionally, the acute toxicity is conveyed by Avice's framing of "minutes" as a concerningly long amount of time for Yohn to have breathed it.

In addition to establishing the familiarity of this situation to Avice, this presentation of consequences allows the reader to be the one to link together cause and effect, mirroring the ways that observational and empirical science is traditionally done. Historians Shapin and Schaffer call this particular style of justifying knowledge-claims "virtual witnessing," in which detailed but deliberately neutral descriptions of phenomena are circulated and then, separately, analyzed (Shapin and Schaffer 1985). The impact of virtual witnessing persists in scientific papers in the separation of Methodology and Results sections from the analytical Discussion section, constructing a barrier between observed phenomena and the conclusions drawn from those phenomena. Phenomena, it is implied, are indisputable, while arguments about their causes are more acceptable for debate. Much as scientists draw their conclusions from observations, seeing-in-use relies on readers to derive conclusions from the curated observations in the texts.

There are several ways that temporality is used in exposition: to dilate a moment to indicate the importance of the information being conveyed, and to distinguish *information* from *narrative events*. In Gaiman's *The Graveyard Book*, the main character's encounter with ghouls is marked by both an explanation about ghoul society and a temporary shift into present tense:

> Ghouls do not build. They are parasites and scavengers, eaters of carrion. The city they call Ghûlheim is something they found, long ago, but did not make. No one knows (if anyone human ever knew) what kind of creatures it was that made those buildings, who honeycombed the rock with tunnels and towers, but it is certain that no one but the ghoul-folk could have wanted to stay there, or even to approach that place. (Gaiman, 82)

It takes longer for the reader to read the paragraph discussing ghouls than for Bod (the main character) to experience the narrative beats that occur immediately preceding and following the paragraph. Additionally, the shift into present tense from past tense creates a clear demarcation between the narrative as a series of events that occur and the information about ghouls as timeless truths. The details being provided about ghouls are not dependent on the specific context of Bod's encounter with them, but are general knowledge and therefore timeless.

STS scholar Thomas Kuhn has theorized that this erasure of the discovery or production of knowledge is key to the authority of science, since new worldviews or scientific paradigms frequently come about at the expense of what came before (Kuhn 1962). This erasure particularly occurs in how textbooks represent science, inducting scientists into the current paradigm and presenting a relatively linear and cumulative view of scientific progress when the history of science is raised at all. This gives the current scientific paradigm the weight of all that scientific progress and provides no models for circumstances in which preexisting knowledge should be questioned. Scientific papers do some of the same work, as Gilbert and Mulkay (1984) describe, observing that when scientists write in what they call the empirical register, they "speak as if their own position is an unproblematic and unmediated re-presentation of the natural world" (Gilbert and Mulkay 1984: 68). Phenomena are time-specific; presentations of the natural world are not. The deliberate employment of certain stylistic features to mimic this is not unknown to SF authors; indeed, hard science fiction author Gregory Benford describes the "essential task" of science fiction writers as "to enlist the devices of realism in the cause of the fantastic." (Benford 1992: 51) By separating the narrative from the background noise of worldbuilding--by presenting said worldbuilding as temporally unmarked--authors grant their exposition the veneer of being free from narrative mediation.

When exposition is filtered through the point-of-view of a character, the authority of the information being conveyed relies on the authority of that character to know. While this allows unreliable narrators to provide incorrect information (either deliberately or not), it also allows readers to build not only networks of information about a speculative world, but also chains of associations of *how things are known*. For example, Chabon's *The Yiddish Policemen's Union* uses the main character's limited experiences with Hebrew to anchor the point of divergence between the reader's empirical world and the alternate history of the novel. Note that, unlike Gaiman's *Graveyard Book*, this entire text is written in the present-text, and therefore the use of present tense here is not an example of temporality as discussed above:

> *Landsman* knows Hebrew when he hears it. But *the Hebrew he knows* is the traditional brand, the one his ancestors carried with them through the millennia of their European exile, oily and salty as a piece of fish smoked to preserve it, its flesh flavored strongly by Yiddish. That kind of Hebrew is never employed for human conversation. It's only for talking to God. *If it was Hebrew that Landsman heard* at Peril Straight, it was not the old salt-herring tongue but some spiky dialect, a language of alkali and rocks. It sounded *to him* like the Hebrew brought over by the Zionists after 1948. Those hard desert Jews tried fiercely to hold on to it in their exile but, as with the German Jews before them, got overwhelmed by the teeming tumult of Yiddish, and by the painful association of their language with recent failure and disaster. *As far as Landsman knows*, that kind of Hebrew is extinct except among a last few holdouts meeting annually in a lonely hall. (Chabon, 286-287, emphasis added)

This passage conveys that, in the world of this novel, Hebrew is not widely spoken outside of explicitly religious contexts, unlike in the reader's world where Hebrew is spoken in

Israel. Additionally, by describing Landsman's experience with Zionists who underwent "recent failure and disaster" after 1948, which corresponds to the year of the Arab-Israeli War, Chabon implies that in this novel Israel lost that war.

This technique relies on the *situatedness* of knowledge, or the ways that an individual's perspective necessarily renders certain things visible or invisible--or knowable or unknowable (Haraway 1988). It ties knowledge to the knower, thus implicitly both rejecting the universality of knowledge implied by manipulating temporality and sidestepping the objectivity of experience implied by seeing in-use. Not only does that passage show the effect of the facts is presents on Landsman, but by employing seeing-in-use to omit knowledge that is clearly known to Landsman as well it emphasizes the taken-for-granted nature of that knowledge. Landsman does not have to articulate in his own point-of-view that Israel lost the 1948 Arab-Israeli War, because he lives in Sitka, Alaska, where the Jewish refugees who were unable to relocate to Israel went instead. Using characters' knowledge to impart information about speculative worlds allows the author to both create a world and situate a character within it, highlighting that other locations from which to know exist.

Dialogue, Extradiegesis, and Register: Networks and Expertise

Occasionally authors will invent other sources of material that exist within the universe of their speculative world and incorporate them into the story without explicitly placing them within the narrative. Grant's *Feed* employs this great effect, showing blog posts written by main characters (usually before the beginning of the novel's narrative), foregrounding the political and narrative importance of these posts:

My profession owes a lot to Dr. Alexander Kellis, inventor of the misnamed "Kellis flu,"

and Amanda Amberlee, the first individual successfully infected with the modified

filovirus that researchers dubbed "Marburg Amberlee." Before them, blogging was something people thought should be done by bored teenagers talking about how depressed they were. Some folks used it to report on politics and the news, but that application was widely viewed as reserved for conspiracy nuts and people whose opinions were too vitriolic for the mainstream. The blogosphere wasn't threatening the traditional news media, not even as it started having a real place on the world stage. They thought of us as "quaint." Then the zombies came, and everything changed. (Grant, 47-48)

These blog posts not only establish that the blogger protagonists have legitimate credentials, which is important to the plot, but also that the information contained within the blog posts is trustworthy, allowing Grant to shift a certain amount of exposition into a register that is already meant to be informative.

By marshalling these additional resources (even if they are just as speculative as the rest of the novel), authors invoke networks of knowledge and borrow the authority of their speculative sources. As Bruno Latour has shown, the scientific acceptance of a fact is difficult to separate from the social circumstances of its proponents gathering support. The facticity of a fact, in other words, is related to how many people acknowledge it as such, and the more people endorse a fact the harder it is to deny (Latour 1987). The technique of bringing in additional speculative resources presented as being sourced differently than the narrative (i.e. showing a distinct register) creates speculative networks of authority for an author's made-up facts.

Perhaps the most well-known and cliché technique of exposition is the use of dialogue, wherein one character tells another character information. When done badly, it gets called "As you know, Bob..." dialogue, pointing out the absurdity of one character telling another character

something they already know for no discernable reason other than to convey that information to the audience. When done well, dialogue can provide an illustration of persuasion and knowledge circulation at work. For example, in the early pages of Bacigalupi's *The Windup Girl*, two characters argue about the closing of a plant, each deploying facts about the speculative world to bolster their argument:

"I've got kink-springs the size of my fist that hold a gigajoule of power. Quadruple the capacity-weight ratio of any other spring on the market. I'm sitting on a revolution in energy storage, and you're throwing it away." [Yates] leaned forward. "We haven't had power this portable since gasoline."

"Only if you can produce it."

"We're close," Yates insisted. "Juts the algae baths. They're the only sticking point." Anderson said nothing. Yates seemed to take this as encouragement. "The fundamental concept is sound. Once the baths are producing in sufficient quantities--"

"You should have informed us when you first saw the nightshades in the market. The Thais have been successfully growing potatoes for at least five seasons. They're obviously sitting on top of a seedbank, and yet we heard nothing from you."

"Not my department. I do energy storage. Not production."

"Where are you going to get the calories to wind your fancy kink-springs if a crop fails? Blister rust is mutating every three seasons now. Recreational generippers are hacking into our designs for TotalNutrient Wheat and SoyPRO. Our last strain of HiGro Corn only beat weevil predation by sixty percent, and now we suddenly hear you're sitting on top of a genetic gold mine." (Bacigalupi, 5-6)

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This argument not only conveys those facts to the audience, who see the importance and context of such speculative elements as blister rust, generippers, and seedbanks, but also embeds these facts in networks of meaning. It efficiently establishes that both food production and energy storage are serious issues in the world of this novel, and Yates's discussion of kink-springs and favorable comparison to gasoline in the past tense shows the shift in energy storage in this post-fossil fuel world. Anderson's displeasure at not being told that the Thais have potatoes tells the reader that potatoes are rare and that considerable resources, such as seedbanks, are devoted to food growth. Further, the description of the challenges faced by their company shows that this world is not only post-oil but also subject to dystopian diseases and corporate control of genetically-modified organisms.

The way that all of these inferences are embedded in an argument over the prioritization of energy storage versus food production shows the ways that these elements are inseparable from their attendant networks of social interests, such as those theorized by Latour. Dialogue allows authors to show actors using information to build their networks of knowledge, enrolling the reader into that network.

Materials that are packaged with a novel but not included in the speculated world fall into the category of extradiegesis. These include glossaries, maps, acknowledgements to technical experts, afterwords, forewards, casts of characters, timelines, etc.--any technique that transmits information directly from the author to the reader without being couched in narrative terms. *Boneshaker* by Cherie Priest, for example, includes an author's note at the end that outlines the logic of where her alternate history diverged from reality and points out where she knowingly departed from this logic:

As I believe *Boneshaker*'s premise makes clear, this is a work of fiction--but I've always

enjoyed including local landmarks in my novels, and this one is no exception. However,

let me take a moment to assure you that I'm *fully aware* [emphasis in original] of this

book's particularly grievous and shameless warping of history, geography, and

technology [...]

So there's no need to send me helpful e-mails explaining that King Street Station

wasn't started until 1904, that the Smith Tower wasn't begun into 1909, or that

Commercial Street is really First Avenue. I know the facts, and every digression from

them was deliberate.

At any rate, thank you for reading, and thank you for suspending your disbelief for a

few hundred pages. I realize that the story is a bit of a twisted stretch, but honestly--isn't

that what steampunk is for? (Priest, 415-416)

I have included as much of this note as I have for several reasons. First, Priest frames her

speculations apologetically and cites the sources upon which she based those speculations. It is

not uncommon for authors to acknowledge individuals or institutions that helped them with their

research,[33] but Priest here reiterates her awareness of the interplay between fiction and research

in this work. Furthermore, by the end of the note its purpose is not only clear but explicit: to

forestall complaints about a lack of realism. In this note, Priest is implicitly making a distinction

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[33] For example, Willis thanks "every librarian within a hundred-mile radius" and "the marvelous group of ladies at
the Imperial War Museum the day [she] was there doing research" (n.p.); and Stephenson frames himself as
"indebted" to several large projects including the Millennium Clock, the Orion project, and "a philosophical lineage
that can be traced from Thales through Plato, Leibniz, Kant, Gödel, and Husserl" as well as "many more people than
can be comfortably be listed on a traditional acknowledgements page" (n.p.).

between making things up and a "digression" from reality, as well as preemptively guarding

herself from attacks on the realism of her novel. In this way, the note becomes part disclaimer

and part shield.

This provides an example of Latour's Actor-Network Theory outside the confines of the

narrative. These explanations can be an attempt by the author to enroll the reader into the

network of knowledge that makes the text's world, acknowledging that the information is

important but that there is no reason within the narrative for such a resource to exist. In Priest's

case in particular, the explicit acknowledgement of the limits of her speculation reasserts her

authority over the speculative world, particularly when she informs readers that she "know[s] the

facts, and every digression from them was deliberate." (Priest, 416)[34] The success of these

extradiegetic materials relies on the author's success in enrolling the reader into their network; as

I will discuss in later chapters using the example of this author's note by Priest, this may not

always be successful.

Sometimes, however, the extradiegetic materials provides a repository of information that

is otherwise distributed throughout the novel, but presented in a way that might be complicated

for the reader to keep track of. Stephenson's *Anathem*, for instance, begins with a Note to the

Reader that contains a timeline of the past 7000 years of history for the world of the novel, a

resource provided on top of the Dictionary entries mentioned earlier. There is also a glossary

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[34] Priest has indicated via Twitter and interviews that she was regularly contacted about inaccuracies despite this note, as I discuss later.

(that spans 30 pages in the trade paperback edition) for names, neologisms, and important concepts, along with several appendices containing mathematical proofs (another 30 pages).

This additional information, and how it is intended to be used, is couched by Stephenson as a tool for readers unfamiliar with the form of this particular novel, as he begins his note by saying, "If you are accustomed to reading works of speculative fiction and enjoy puzzling things out on your own, skip this Note" (Stephenson, xv). This implies that works of speculative fiction frequently limit their exposition to diegetic contexts, and that part of becoming accustomed to speculative fiction is learning to pick up this information as one reads; indeed, that "puzzling things out" is an integral part of becoming accustomed to the genre, if not the point of the genre, as I will discuss in more detail shortly.

Focus and Didactic Tone: Authority, Gender, and Genre

Exposition is frequently marked by passages that include much more granular or extensive detail than the surrounding passages. This is frequently used in hard science fiction to provide exhaustive proof of the author's speculation to the reader. For instance, Stross's *Saturn's Children* features the point-of-view character using the narration to go through a back-of-the-envelope calculation of different interplanetary trajectories:

A quick search of the shipping pages reveals the depressing truth. Mars to Jupiter demands a whole load of delta vee; a straightforward Hohmann transfer orbit--the cheapest--takes three and a half years, and the launch window only opens up about once every Martian year, just under once every two Earth years. Even worse, Mars and Jupiter are nearing opposition right now, adding nearly four astronomical units--600 million kilometers--to the high-delta-vee flight path, so the normally fast M2P2 magsail ships spend a good part of their journey tacking against the solar wind. You can get it down to

just a year, if you've the money to pay for passage on a fast VASIMR liner--but the mass ratio is so poor that you'll want to make the trip in hibernation; for every kilogram that arrives, twenty set off. On anything faster than a Hohmann transfer, the excess baggage charges are so monstrous that travelers have been known to amputate their limbs before departure and buy new ones on arrival. Finally, then, there are the nuclear rockets, but they're out of my price range; I'm not a millionaire. (Stross 148-149)

Here, Stross uses technical jargon like "delta vee" and "Hohmann transfer orbit," which not only dips into vocabulary typically restricted to scientists but is also verifiable as they are terms that are in use today. This attention to detail even extends to the unit conversion of astronomical units to kilometers, rendering the character's consideration of the orbits almost like a geometric or physical proof. Such emphasis on facticity harkens back to the days of pulp science fiction, when magazines such as *Amazing Stories* and *Science Wonder Stories* included factual quizzes whose answers could be found within their stories and used letters pages to host debates over the implementation of scientific ideas in their stories (Cheng 2012).

In this context, the increased focus builds the legitimacy of the speculative world by displaying the author's technical mastery. In addition to exhaustively showing that the *character* is familiar with these details, it also shows that the *author* is, allowing the author to take up the position not only of the creator of the world, but also as a technical expert. This display of expertise has been suggested as a stylistic feature of science fiction to some, frequently associated with pulp-style SF:

Later critics and fans describe, often pejoratively, stories of the interwar era as clunky, clumsy, simplistic, and more concerned with discourses on the operation of their science than development of character or theme. While such descriptions are not necessarily

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inaccurate, their dismissals miss the point. While readers also valued traditional elements of literary style--plot, character, theme, and language--as the volume of discussion on the subject testified, for many in the 1920s and 1930s, science was their primary concern. For them, scientific accuracy was a stylistic prerequisite, although accuracy, in this sense, was the strict truth of its facts and not a more comprehensive integration of knowledge, reasoning, and context. (Cheng 2012: 93-94)

This aesthetic preference for accuracy, however, is not unique to the style of the pulps. Author Gregory Benford, discussing hard science fiction, emphasizes the importance of facticity:

The drone of meticulous explanation appears often [in hard science fiction], almost like a bizarre fetish--because the authors want to retain the authority of nonfiction, its touchstones of an external (though provisional) truth. Thus the writer may stretch a quantitative point for dramatic effect, but not commit the unpardonable sin of lying-- giving scientific misinformation to the reader. (Benford 1994: 18)

Speculative fiction scholar Gary Westfahl also suggests that the willingness of hard science fiction authors to engage with readers and fans about their processes of extrapolation may mirror the transparency valued in science:

It would seem that the work of hard science fiction writers is similar to the work of scientists in at least one respect: Scientists should always be willing to describe in detail how they performed their experiments, so that others can duplicate and check on their work; and hard science fiction writers always seem willing to describe their imaginative creations in detail, thus opening up their work to the same kind of inspection. (Westfahl 1996: 39)

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Westfahl then continues to theorize hard science fiction as a game, with the objective of avoiding scientific errors in stories (Westfahl 1996: 41). This is echoed as well in Benford, who notes that hard science fiction "authors speak of 'playing the game'--getting striking, surprising but physically plausible scenes into their work, and being able to defend their extravagances with 'hard' scientific arguments, even calculations" (Benford 1994: 22). Benford even continues on to parallel these technical discussions with the technical discussions of scientists. Focus, in this context, can be seen as an attempt by the author to out-science the reader, packing as much scientific authority into a passage as possible.

Similarly, the adoption of an explicitly didactic tone--which frequently co-occurs with increased focus--positions the speaker or narrator as an expert. Doctorow's *Little Brother* frequently uses its first-person narrator to explicitly explain and contextualize the principles underlying the cybersecurity that is key to the story. These explanations frequently use indirect address (the general "you") or informal instructions such as "look it up on Wikipedia if you really want" (Doctorow, 97), which creates a tone that is both relatively informal and indicative of a one-direction flow of information. The narrator, who is an expert, indirectly addresses the reader, who implicitly is not, and provides explanations. The role of "technical expert" may be slightly shifted to that of "teacher," but there is still an implicit epistemological power imbalance.

Ethnographies of technoscience (including lab ethnographies, ethnographies of amateur technical spaces, and ethnographies of STEM education contexts) show that displays of technical mastery are frequently associated with chilly climates for women and marginalized people in technoscience. Technical mastery can be interpreted by underrepresented groups as displays masculine dominance, particularly in technical spaces. Sociologist Wendy Faulkner has observed that engineers frequently think of or discuss social values or qualities as being mutually-

exclusive with technical expertise, in what she calls the technical/social binary (Faulkner 2000a, 2007). For engineers who belong to marked social categories (that is to say, underrepresented groups in engineering such as women and people of color), being socially "marked" in this way leads other engineers to discount their technical prowess or expertise, placing them on the "social" side of the technical/social binary.[35]

The adoption of a didactic tone, while appropriate for the circumstance of an author who knows more about their speculative world than the reader, may also bring to mind a particular gendered dynamic of explanation: mansplaining. Mansplaining, wherein a man explains a topic to a woman who knows more about that topic, is a specific scenario in which a man underestimates the ability of a woman to be an expert specifically because she is a woman, which philosopher Nicole Dular identifies as a form of epistemic injustice (Dular 2021). I draw out this connection not to imply that the adoption of a didactic tone in science fiction is necessarily mansplaining, but to highlight the political consequences of such a dynamic in other contexts. Didacticism has an unequal power dynamic embedded into it by definition, illustrating how the communication of speculation may create and enforce epistemic authority much as the communication of facts does in technoscience.

Politics and the Epistemology of Genre

Genre, speculation, and craft are not politically neutral. Many science fiction histories have written out the presence of women authors (Larbalestier 2002; Merrick 2000; Yaszek

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[35] For an in-depth case study of the devaluation of women's technical expertise, see, e.g., Chung (2020)'s in-depth case study of the first Korean astronaut.

2008), and discourse around issues of gender and genre frequently conflate the participation of historically underrepresented groups with specific stylistic choices or types of content. The Sad and Rabid Puppies, as described in Chapter Two, positioned such participation as opposed to a perceived tradition of good old-fashioned science fiction, perhaps harkening back to the Golden Age that SF scholar Adam Roberts notes was created "by a partisan fandom...valori[zing] a particular sort of writing: hard SF, linear narratives, heroes solving problems or countering threats in a space-operatic or a technological-adventure idiom." (287)

Indeed, certain techniques of exposition are seen as genre markers of hard SF. As Brian Attebery notes, Kathryn Cramer identifies a technophilic stance as one of the markers of hard SF: "If a story makes the reader feel that he (using the gendered pronoun advisedly) is part of a technologically-minded elite, someone who can contemplate the real workings of the universe without fuzzy feelings or sentiment, then [a work] is hard SF regardless of its scientific accuracy." (Attebery 2002: 48) This harkens back to the technique that I've identified as focus: a high level of technical detail that nevertheless does not question the authority of science to generate facts certainly counts as "contemplat[ing] the real workings of the universe without fuzzy feelings or sentiment." (Ibid.) Nor is focus unique in its status as a genre marker: Nevins identifies a specific style of pulp SF from the 1940s, characterized by "avoidance of literary flourishes, difficult vocabulary, [...] subtle characterization, and its general embrace of formulaic storytelling" (Nevins 2014: 102) Kathryn Cramer, in her introduction to *The Ascent of Wonder* hard science fiction anthology, describes "paragraphs giving clear evidence that the writer spent all day calculating the nature and quality of eclipses on a planet with five moons" (Cramer 1994: 25-26) and notes the tendency of hard science fiction authors to conflate the subgenre with science itself. In his own introduction to the same anthology, David Hartwell states that hard

science fiction is "traditionally told in clear journalistic prose, eschewing consciously literary effects: the prose of scientific description" (Hartwell 1994: 32). Hartwell even specifically suggests that many hard science fiction writers and readers "harbor a deep suspicion of the self-consciously literary, together with an ingrained belief in the efficacy of scientific know-how to solve problems in the real world (and in any imaginable world)." (Hartwell 1994: 32)

I read this as re-inscribing Faulkner's technical/social binary, positioning "literary values" in opposition to "scientific know-how." This resonates with a tendency of histories of speculative fiction to equate the influx of women and marginalized writers with the influx of soft science-fiction or even New Wave experiments in style, as some histories of women's SF have noted (Merrick 2009; Larbalestier 2002). This mythology, as Westfahl calls it, can be generalized to larger cultural debates within SF: namely, the Sad and Rabid Puppies' self-proclaimed condemnation of "social justice warrior" SF.

This argument has clearly drifted away from the issue of prose or techniques of exposition, which is rather my point. As much as Doctorow may adopt a didactic tone in explaining the history of cryptography, Grant does the same in describing viral amplification. As Stross enumerates the physical laws governing orbital dynamics, so does Walton describe the relational rules of sympathetic magic. As Bacigalupi establishes the authority of characters by having them debate technical minutiae, so does Bujold show the investigative prowess of characters by having them talk out a sociotechnical problem. Indeed, the texts frequently layer and combine techniques, regardless of author. While certain techniques may be associated with a genre or a gender, the texts themselves do not fall neatly along such lines, no matter how much the discourses surrounding the texts act as if it were otherwise.

There are several caveats to my argument, first and most obviously that the sample of novels I examined is heavily skewed towards white male writers. Yet even so, no matter how these techniques are deployed, some fit into patterns that the social studies of science have shown to create inequitable outcomes in STEM, raising the question of whether such techniques may be deployed equitably in this context. For the subgenres that rely on these techniques, furthermore, their acceptance as legitimate may *also* lead to inequitable outcomes, as several of the authors included in my sample have discussed in other contexts (i.e. Twitter).

In the next two chapters, I turn outside the texts to audience reception (through online reviews) and authorial intent (through preexisting interview material) to see how gender and speculative authority are built into the genre in the larger community. In them, I examine the co-construction of gender, genre, and scientific authority, finding that critiques accrue disproportionately along the technical/social binary to reinscribe authority into white masculine technoscience.

This particular chapter has shown how these larger political questions are at play on the smaller scale, in exposition rather than reception. Yet one thing remains clear: Much as issues of legitimate knowledge in science are not politically neutral, neither are issues of legitimate speculation in fiction.

Chapter Four: Reviews, Reception, and Norms

Online Book Reviews

SF has always had a long and storied tradition of community engagement (see Chapter Two for details), and the emergence of the digital age has done nothing to diminish this dynamic. For the time period of this study, the best way to capture reader reactions was to turn to online, user-generated book reviews, as they offered the best opportunity to assess many reviews at once and could be gathered from a central source (unlike, for example, critical book reviews in SF magazines).

Contemporary online book reviewing sites go beyond being simply a repository for individual users' reviews. They can function as well as a site of community building and negotiation. (Worrall 2019) The community-focused aspect of Goodreads in particular made it a good candidate from which to pull reviews.

Goodreads was founded in 2007 with the express purpose of fostering social relationships through books (Chandler and Chandler 2013). The cofounders aimed to provide users with opportunities to discover new books based on their friends' recommendations, and eventually it grew to include book clubs, forums, partnerships with publishers, and, eventually, a sale to Amazon in 2013 and ensuing Kindle integration. Users can add books to "shelves," categorizing them any way they want, as well as rate and review the books. While Goodreads is social, it is also, inescapably, embroiled in the capitalistic ecosystem that is the book world. Indeed, some cite it as a sign of the "datafication" of bookish communities, with its proprietary recommendation algorithms (Murray 2021).

I am not the first to use Goodreads reviews as an archive for a research project. Methods have varied from big-data automated analysis of a large body of reviews (Thelwall 2019) to multiple-case studies (Driscoll and Sedo 2019) to a qualitative deep-dive of a single case (Driscoll and Sedo 2019). I have aimed somewhere in the middle, collecting a subset of reviews for each of the novels in my sample.

For this project, I manually scraped the 300 earliest-shelved reviews for each novel on Goodreads. Nevertheless, some ratings (without associated text reviews) made it into the sample, accounting for the novels with fewer than 300 reviews.

The sample provided a wide variation in the number of total reviews, with the lowest at the time of collection being 249 (*Brasyl*) and the highest being 44,092 (*Little Brother*). This, combined with sorting difficulties and the inaccuracy of review dates,[36] means that the reviews cannot and should not be considered a representative sample of the reviews overall.

Book	Author	Reviews in Sample	Total Reviews	Percent of Reviews	Rating	Hugo Year
Brasyl	Ian McDonald	248	249	99.60%	3.66	2008
Halting State	Charles Stross	N/A	N/A	N/A	N/A	2008
Rollback	Robert J. Sawyer	300	310	96.77%	3.75	2008
The Lost Colony	John Scalzi	N/A	N/A	N/A	N/A	2008
Yiddish Policemen's Union	Michael Chabon	287	6477	4.43%	3.7	2008
Anathem	Neal Stephenson	290	4888	5.93%	4.18	2009
Graveyard Book	Neil Gaiman	296	27888	1.06%	4.13	2009
Little Brother	Cory Doctorow	297	44092	0.67%	3.93	2009
Saturn's Children	Charles Stross	300	525	57.14%	3.57	2009
Zoe's Tale	John Scalzi	298	1588	18.77%	3.73	2009
Boneshaker	Cherie Priest	299	3943	7.58%	3.5	2010

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[36] When a review is put into Goodreads, the date that Goodreads displays is the date that the user initially shelved, or categorized, the book. Since Goodreads has a popular "want-to-read" shelf, it was not uncommon to see reviews dated before the book was actually released.

Julian Comstock	Robert Charles Wilson	296	334	88.62%	3.56	2010
Palimpsest	Catherynne M. Valente	298	4312	6.91%	3.65	2010
The City & The City	China Mieville	N/A	N/A	N/A	N/A	2010
Wake	Robert J. Sawyer	N/A	N/A	N/A	N/A	2010
Windup Girl	Paolo Bacigalupi	298	6008	4.96%	3.75	2010
Blackout[37]	Connie Willis	300	2956	10.15%	3.83	2011
Cryoburn	Lois McMaster Bujold	299	953	31.37%	4.06	2011
Feed	Mira Grant	299	5795	5.16%	3.86	2011
Hundred Thousand Kingdoms	N. K. Jemisin	299	4537	6.59%	3.84	2011
The Dervish House	Ian McDonald	N/A	N/A	N/A	N/A	2011
A Dance with Dragons	George R. R. Martin	291	22327	1.30%	4.32	2012
Among Others	Jo Walton	299	3901	7.66%	3.69	2012
Deadline	Mira Grant	N/A	N/A	N/A	N/A	2012
Embassytown	China Mieville	299	23788	1.26%	3.87	2012
Leviathan Wakes	James S. A. Corey	300	9322	3.22%	4.24	2012

Table 3: Characterization of review data.

It is not my intention to claim that my analysis is representative of all reviews, nor even to attempt a representative analysis. Indeed, I believe a representative analysis of reviews would be counterproductive to my research question. Neither the specific norms nor the technical/social binary need to be present in every speech act or interaction for it to be noticeable and powerful. In this chapter, then, I focus on how they appear, when they appear, and the implications of their presence in the speculative fiction community.

Although all the reviews used in this project are publicly available, my intention is not to identify any specific reviewer, and I follow Driscoll and Sedo (2019) in not citing usernames. I,

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[37] Technically, *Blackout* was nominated jointly with its sequel, *All Clear*, as they were initially intended to be a single book. However, for the purposes of this project, I only analyzed the reviews for *Blackout*.

instead, use a numeric system corresponding to the identifiers in my qualitative data analysis software (Dedoose) for my own reference.

In this chapter, I use the reviews to show how readers assert norms (both the four norms of rigor, realism, empiricism, and objectivity and the technical/social binary more generally) back on authors in gendered and generic ways. To do so, I begin with a quick case study to illustrate the complex intertextual entanglements of the SF community focusing on George R.R. Martin. I then provide a broader analysis of how readers frame and interact with authors in reviews. Shifting to the transmission of information in the texts, I continue on by describing how readers discuss and dispute the aesthetics of exposition. Next, I return to the figure of the author by analyzing how readers use exposition to evaluate authors' expertise. Finally, I illustrate the ways that gender, genre, and the technical/social binary are inscribed into one another in the reviews.

Author-as-Steward: The Case of George R.R. Martin

Although the definition of "science" is no less fraught that the definition of "science fiction," many STS works have defined the work of science as the work of describing the natural world (e.g. Gieryn (1999); (Subramaniam 2014)). Speculative fiction, then, diverges from science in a rather obvious way: it is defined by how it describes worlds *other* than the reader's empirical world. If the role of scientists is to speak for the natural world, the role of the author is to speak for the fictional world.

Such a shift has significant implications for thinking about authority, be it scientific or speculative. While STS has shown the considerable labor that goes into creating scientific facts (or technological artifacts), it has also shown the processes used by scientists to hide that labor

from uninitiated publics to ensure that science speaks with a singular voice--one that is not attributable to any one scientist. As Hilgartner (2000) notes:

> [S]cientists tinker in the privacy of the laboratory until they are ready to "go public" with neatly packaged results; their published work systematically elides the contingencies of actual research; and at times, they even stage spectacular public demonstrations, displaying results dramatically and visually in a carefully arranged "theater of proof"...Scientific texts conceal the history of their own production[.] ((Hilgartner 2000: 19)

Sf authors have no such united front of authority to wield. In this chapter and the next, I will show how individual texts and authors' speculations are interpreted and disputed. Though various texts might support the speculative authority of other texts (i.e. books in a series), or one author may support the speculative authority of another, each individual author is, in many ways, the steward of the speculative world that they describe in their works. While there are various resources they might draw upon to legitimate their speculations, whether they are granted the legitimacy and authority is highly variable and contingent. Boundary-work to legitimate a speculative element might succeed for one reader but not for another, or might succeed in one work but fail elsewhere; and, indeed, the boundary-work may have little to nothing to do with the speculative element itself, as the figure of the author-as-steward looms over these discourses.

In examining the relationship between authors, texts, and audiences, George R. R. Martin's *A Dance with Dragons* offers a unique case study of how discourses around texts inevitably refer to and borrow discourses around authors. As one reviewer writes:

I know that George R. R. Martin is not my bitch (shout out to Neil Gaiman...yo!), but the dude better put his editing of compilation novels aside and churn out the next book as soon as possible to help get rid of the bad taste this one left me... (5042)

This reviewer references a blog post by Neil Gaiman from May 12, 2009. In it, a reader ("Gareth") asked Gaiman two questions: whether social media was giving readers too much ability to scrutinize authors, and whether Martin has an obligation (in fact, a personal obligation to an individual reader) to finish a book. Gaiman's response reads, in part:

My opinion....

1) No.

2) Yes, it's unrealistic of you to think George is "letting you down".

Look, this may not be palatable, Gareth, and I keep trying to come up with a better way to put it, but the simplicity of things, at least from my perspective is this:

George R.R. Martin is not your bitch. (Gaiman 2009)

Gaiman goes on to provide a model for the interpersonal relationship between author and reader, noting that Gareth implicitly frames the purchase of a book as a contract with Martin that Martin would continue to write the series. Gaiman notes that, instead, "You were paying your ten dollars for the book you were reading, and I assume that you enjoyed it because you want to know what happens next." (Gaiman 2009)

The impact of Gaiman's statement was not confined to his blog post. It was taken up by the SF ecosystem and the popular culture ecosystem more broadly. The multimodal means by which fans express themselves can be seen in, for example, the two fan songs referencing Gaiman's post (Sabourin (2014) and Anealio (2012)). Additionally, likely due to the popularity of the television adaptation of *A Song of Ice and Fire*, *Game of Thrones*, even non-SF specific

pop culture commentary sites referenced that Martin's writing pace had ascended to meme status (Ryan 2017). Unlike scientific authority, which as Shapin and Schaffer (1985) show has been historically tied to at least the pretense of being universally accessible, speculative authority rests on the author. There simply is no speculative world to access without the author to speak for it. Theoretically, if Gareth objected to, say, the slow pace of research in a particular field, Gareth could go out and do the research themselves, because they have access to the same nature as the scientists.[38] In traditional publishing and under contemporary copyright laws, however, Gareth could not do the same for the world of Westeros; even if they were to engage in transformative fan practices and write fanfiction about Westeros, it is arguable at best whether it would still be *Martin*'s Westeros. Martin is, in some ways, a bottleneck to readers' access to Westeros, and this may well reflect in readers' responses to the text itself.

All this is to establish the messiness of studying author-reader relationships, particularly as mediated through a text. It is not simply that a reader might comment on an author by means of discussing the author's text; in SF, there are knock-on cultural effects that may lead to literal songs being published about one author's commentary on another author's fan's attitude toward that author. This, obviously, can be thought of as an extension of the framework of SF-as-megatext as discussed in Chapter Two; it can also be seen as one way in which the internet has mediated the relationships between producers and consumers.

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[38] I am aware that this is not an uncontroversial stance, particularly in light of the work of certain feminist epistemologies such as Barad (1998)'s agential realism and I can only get the reader's indulgence.

However, for the purposes of this dissertation, it is important to acknowledge that Goodreads reviews can only barely scratch the surface of the richness of these interactions. A full ethnographic approach to author-reader relationships, let alone a full *digital* ethnography, is well outside the scope of this project.[39] Even Goodreads is not exempt from more complex or, indeed, even more direct interaction between producers and consumers of media, since incidents have shown blurred social and professional boundaries between readers (specifically Goodreads reviewers) and authors (Matthews 2016).

Increased attention to the role of authors in discussing texts also allows for a richer analysis mirroring how STS strives to return attention to the roles of humans in creating knowledge or artifacts. Although scientific knowledge relies on universality for its validity, STS research has shown that in practice it is not, nor has it ever been, universally accessible, even at the dawn of empiricism (Shapin and Schaffer 1985: 334-36). Scientific knowledge is inevitably marked by the people who are in the room--or the lab--when it is created, as speculative fiction is inevitably marked by its author. As the reviews show, reviewers are aware of the author's identity, opening the door for their readings of the texts to be impacted by that knowledge; for readers to, for example, judge the works of women and people of color differently than they judge the works of white men.

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[39] This applies to both this chapter and the next; I have made a concerted effort in both to limit the incorporation of additional materials or incidents even if they relate to the specific texts included in this study or involve the authors in this study during the study period. This includes, for example, the backlash to Neil Gaiman's mention of Native Americans in an interview about *The Graveyard Book* and the constellation of discussions that constitute RaceFail, in which Walton, Bujold, Scalzi, and Jemisin all participated to some extent.

Reviews are only one way among many that readers and fans of SF may apply norms *back* to authors. Martin's status as fandom's bitch or not is one example of the kind of complex interactions that can be found in fandom, albeit an unusually high-profile one. Reviewers are in many ways Martin's peers in addition to consumers of his products, and they may attempt to enforce norms on Martin as well as their other peers.

Lastly, to reiterate, this case is important because it shows how features *not in the text itself* may nevertheless impact its reception--and attitudes towards the author. Reviewers of *A Dance with Dragons* frequently mention how long it took for the book to come out and how much they hoped the next one wouldn't take as long to write.[40] The series (*A Song of Ice and Fire*) was compared to Robert Jordan's *Wheel of Time* by multiple reviewers, both for perceptions of excessive length and for concerns that Martin might not live long enough to finish the series. As one reviewer stated, "Slow progress from grr, maybe due to most of his fingers in pies. Will he finish or will the baton be passed to Sanderson to finish much like wot." (5142)

Reviewers speculated that Martin's attention was divided among other projects during this long writing period, contributing to their perception of the quality of the book: "I'm not sure if it was the fact that GRRM was focused on the HBO adaptation or that it was just such a long time coming, but I was able to walk away from this book for weeks at a time." (5239) One reviewer also brought in information about the book that Martin provided elsewhere and expressed concern for Martin's mental state, saying:

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[40] *A Dance with Dragons* was published six years after its predecessor, *A Feast for Crows*. The next book, *The Winds of Winter*, has so far taken eleven years and as of this writing has not been completed.

George R. R. Martin briefly brought up one of his most tumultuous periods in the six-year writing saga of A Dance with Dragons, saying that in a year or two who [sic] would discuss it in greater detail once everyone had read the book, but confessing that he had sacrificed at least a year at what he refers to as his "Meereenese Knot," in trying to decide how events were to transpire and what characters and POVs were to be involved, featuring rewrite after rewrite after rewrite. It seems Martin may have in fact written himself into a deep, dark pit of despair that he hasn't really been able to write himself out of. (5026)

These reviews demonstrate a regular feature of how reviewers respond to the novels: by using the text to construct an idea of the author through their presumed relationship to the text. Sometimes, as in the above quotes, this takes the form of commenting on the author's state of mind, whether by text alone or assisted by external information (such as the interview statement). Sometimes this goes further in directly addressing the author. The strongest (and by far most extreme) example can be seen in another review of *A Dance with Dragons*:

So listen up, George Martin: if [Jon Snow is actually dead, (hide spoiler)] I'm going to motherfucking kill you, you old hatted fart. You think I'm kidding.

I'm not. (5060)

Not all instances of direct address were this extreme, thankfully. Sometimes these statements exhorted Martin to write faster, sometimes they informed Martin that they didn't believe certain plot twists would stick in the next book, and at least one was a fully-fledged open letter.

Authors in Reviews

George R.R. Martin is by no means the only author to feature strongly in reviews, both on a textual level (by being framed as the ones acting through the text) and on more metatextual levels (as being markers or indicators of qualities of the text).

To other authors, direct address served several other functions as well, sometimes praising, apologizing to, thanking, making stylistic requests of, insulting, and expressing psychic affinity for the authors. These statements could serve as critique: "John, I thought you were walking away from this universe for a while? If you have to retell the same tale it's time to dig another well, this one is dry." (7063) Or stylistic suggestions: "First, it's written in Present Tense. Bad, Paolo Bacigalupi, Bad!" (175)

Interestingly, at least one review included a statement directly responding to something Scalzi said in the author's note to *Zoe's Tale*. Scalzi wrote,

> [T]here was some (totally fair) criticism of [*The Lost Colony*] that Zoë going off into
> space and somehow coming back with a "sapper field" that was pretty much exactly what
> the defenders of Roanoke needed to defeat their attackers represented a complete *deus ex*
> *machina* maneuver on the part of a lazy writer. Yes, well. This is the problem of knowing
> more than your readers; as an author, I knew all the back story, but there was no way to
> get it into the book without wrenching the whole book onto a 30,000-word tangent. So I
> did a little hand waving and hoped I wouldn't get caught. Surprise! Apparently I have
> smart readers. (Scalzi, 402)

Zoe's Tale takes place contemporaneously with *The Lost Colony*, told from a different point-of-view. The incident Scalzi refers to serves as the climax of *Zoe's Tale*, and several other scenes reflect events that occurred off-page in *The Lost Colony*. One reviewer calls Scalzi out on

his assumption that such "hand waving" would be overlooked: "This is what you get for cultivating an intelligent readership, Scalzi." (7021) The notion of "cultivating" a readership shows an important aspect of author-text-reader interactions by employing a framework that suggests that, through the text, authors and readers select one another.

Authors are commonly framed as actors "doing" the things that appear in the text. For instance, one reviewer said of Bujold's *Cryoburn*, "Can't believe she ended it like that!!!! I NEED more!!!"[41] (468); another reviewer said of Chabon's *Yiddish Policemen's Union* "The annoying thing [about the text] is that it allows Chabon to go on at length about Jewish history, Hebrew and Yiddish etymology, the outfits of the different sects of Jews..." (655); and of Grant's *Feed* "Grant is a bit repetitive and too much time was spent explaining how the technical gadgets of the future work." (1913)

Though it may seem obvious, the fact that a feature of the text (the ending; the length; the repetition) is attributed to an action by the author (*Bujold* ended it; *Chabon* went on at length; *Grant* was a bit repetitive) implies a relationship between the text and the author that deserves consideration. In some ways, statements such as this conflate the text and the author. The resulting text is framed as interchangeable with authorial actions, portraying authors as responsible for the text. Such a bridge between author and text may account for assessments of texts based on features of authorial identity. Readers are clearly aware of the relationship between text and author, and show in their reviews that the author impacts the reception of the

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[41] Exclamation marks taken from the original.

text.[42] The acknowledgement of the individual that is taken for granted in SF deviates from the norm of universality in science, where scientists speak for nature and not themselves; indeed, as discussed in an earlier section, highlighting the individual is frequently a feature of what Gilbert and Mulkay (1984) refer to as the "contingent register," which is used to undermine the authority of scientists and which will be discussed in more detail later in this chapter.

The focus on individual authors is particularly interesting because reviewers do not hesitate to *also* frame some textual features as the result of insufficient editorial management of the author, acknowledging (albeit implicitly) that authors do not have full autonomy over the final, published versions of their work. For instance, one reviewer speculated of Martin's *A Dance with Dragons*:

> I don't know if the quality suffered because the author won't submit to an editor, or if he was in a rush to get this out after so long or if he has become too wrapped up in it, but I'm betting if he had been held to a tight deadline and had a ruthless editor the end product would have been much better. (5347)

Martin is not the only author whose text is accused of editorial failures. Reviewers speculate that Chabon's editor has "a case of author worship" (753), that Stephenson's editor "held him in check somewhat" (5347), Willis "needs a good editor" (4208) while Scalzi needs a "tougher" one (7249), and McDonald needs "an editor with a big steel ruler to rap his knuckles when he misbehaves. Naughty Naughty Naughty boy." (2474; sic) This shows awareness on the

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[42] At least one reviewer is aware of this, too, saying of *The Hundred Thousand Kingdoms*, "This is a very solidly written book written not only by a female sci-fi author, but a minority one at that. Don't let that influence your opinion, but I know in this day and age some people really are looking for those sorts of things." (2131)

part of the reviewers of the nature of textual production and the different responsibilities that different parties play. Authors may be interchangeable with their texts, but it is the job of editors to make sure that authors stay on task, meet deadlines, don't go on at excessive length, and, overall, behave.

The role of the author, though, is not restricted to a single text. Many reviewers, perhaps due to the selection bias of the review sample, mention their expectations of the books as being influenced by authors' previous works. Reviewers evaluate the quality of the books against the quality of previous works, and use the individual text as a litmus of whether more of the author's works are worth seeking out.

Sometimes reviewers are disappointed when a book fails to meet their expectations as previous fans of the author. As one reviewer wrote of Willis's *Blackout*, "This was just sort of disappointing, the kind of work that feels like it's an author who should know better, spinning her wheels and not really getting any traction on the story." (2056) This review suggests that textual features of one work by an author may carry over into readers' assessment of another work by the author. It is outside the scope of this dissertation to speculate on whether this level of intertextual interplay between author and reader is unique to speculative fiction, but the way that authorial identity informs--at least occasionally--the reading process should not be ignored.

One reviewer said in their review for *Among Others*, "I suppose that Walton considers us mature enough to draw our own conclusions and pad out the post-story as we see fit. But I'm still left wanting more, wanting more specifics that the subtlety of magic use in this book doesn't seem to provide." (4420) This frames an awareness of a specific relationship between Walton, who considers the audience while writing; the text, which ends before the "post-story" and "doesn't seem to provide" specifics about the system of magic; and the audience, both concretely

in the case of the unsatisfied reviewer and abstractly in Walton's imagination as she writes. The

reviewer is not simply unsatisfied by the ending, but feels the need to comment on the author's

potential motivations despite having only the text to base these comments on.

Similarly, one reviewer says of Miéville in *Embassytown*:

Mieville expects a lot out of the reader in this novel. He has created a remarkable world,

society, and vernacular but doesn't spend a ton of time on exposition. The reader is forced

to fit pieces in contextually as they go along, which can be frustrating as sometimes

you're not entirely clear what you're supposed to "know" and what you're not. This will

annoy some readers and I'm pretty sure this was by the author's design. (2868)

This similarly projects Miéville's expectations of the reader into the text, extending the

author's presumed attenuation of his relationship to the reader to the point of the reviewer

presuming that the author was deliberately attempting to evoke a specific reaction in some

readers and not others. It also speaks to the reading process as one that requires *labor*, whether

by the author or the reader. The process of translating facts about the world that exist in the

author's mind into prose that allows the reader to incorporate these facts into their view of the

speculated world is one that the author undertakes--or, in this case, doesn't. This authorial silence

leaves the reader to not only piece together knowledge about the speculated world themselves,

"fit[ting] pieces in contextually as they go along," but the knowledge that these textual traces are

the result of authorial choice adds an additional layer of knowledge to be had: *whether the author*

intends the reader to know something. As the reviewer says, "sometimes you're not entirely clear

what you're supposed to 'know' and what you're not." The instances when the author invokes

something the reader *is* supposed to 'know' become indistinguishable from when the author

introduces something new, which implies that, traditionally, there is an expectation that texts

treat the introduction of new knowledge or elements differently than the invocation of that knowledge or those elements later. The author's refusal to differentiate both naturalizes the knowledge to the character (as *Embassytown* is told in first-person) and further estranges the reader by requiring the reader to do the work of sensemaking. In this review, the reviewer suggests that Miéville knew that some readers would not want to do that work, and implies that this technique therefore not only acts as a gatekeeping mechanism, but was intended to do so by Miéville.

Miéville is, in this review, front-and-center in precisely the way that individual scientists are *not* supposed to be in the traditional empirical register. If scientific prose is meant to be the unmitigated description of nature, then the reflexive process described in this review is just about the opposite of that by foregrounding the authorial interference between the speculated world and the reader. Furthermore, as the reviewer points out, "this was by the author's design"--it is not a bug, but a feature that is simply unwelcome for some readers (including the reviewer).

Sometimes these imagined authorial states-of-mind do cross the line into *ad hominem* attacks, accusing authors of using their prose to display their own narcissism. One reviewer said of *Palimpsest*, "Valente seems more in love with her own prose and her thesaurus than the plot (of which there was none)." (4917) Another reviewer expanded on this notion of the novel as the author's way to deliver their own interests, saying of Stephenson's *Anathem*:

> The same complaint many folks have about Tom Clancy books applies here: after a point, story takes a back seat and the book becomes about the author's brain. Clancy goes overboard with the technical details of military ships, and in many cases it's just him showing off his research. In Anathem, Stephenson repeatedly pauses the story to go on

about the math, language, religion, and history of his made up world, but by the end of the book very little of it seemed necessary. (5465)

Here, the reader accuses Stephenson of indulging in his world-building beyond what was required by the plot. This kind of behavior by authors (as mediated by their texts) is sometimes generalized into more abstract classes of behavior, such as an accusation that "Doctorow sometimes slips into self-congratulatory progressive White dude territory, especially when dealing with issues of race and gender, but it never pissed me off to the point of not wanting to read more." (1461) The visibility of the author, then, can indeed be a barrier to readers.

Authorial shortcomings are not the only feature noted. As one reviewer notes, "Saturn's Children marks Stross's serious progression as a writer. He's doing far more advanced tricks with plot and exposition than in his previous novels." (3550) This reviewer implies that they have a familiarity with Stross's previous works and have been tracking his progress as a writer, noting the techniques that are or are not implemented in each book and reading *Saturn's Children* in conversation with those previous works. Reviewers also note the continuity of styles. "I make it no secret that I don't really enjoy Robert J Sawyer's books. So I'll pre-empt this all by saying that if you already didn't like a Sawyer book, you probably won't like this one either, though depending on which of his other books you disliked, this one will probably make you roll your eyes slightly less violently." (3460) Authorial presence is taken as indicative of the features of a text; this review frames *Rollback* as possessing Sawyer-ish qualities that may predict qualities of his other books, and vice versa.

Some reviewers are willing to accept behavior from one author but not another; as a reviewer writes of Doctorow's *Little Brother*, "If I could ever forgive an author who wanted to write an essay and turned it into a novel, it's Cory Doctorow. Very few could couple a synopsis

of current information policy issues with a page-turning thriller, but he did." (1209) This, however, leads to another feature of the reviews: reviewers' responses when the novels no longer *felt* like novels.

Register, Form, and Didacticism

In the Doctorow quote above, the reviewer forgives Doctorow for seemingly beginning his novel as a different form entirely--an essay. Excessive exposition is frequently identified as no longer conforming to the expectations readers have of novels (or, more generally, stories).

This is not always a negative feature. One reviewer admires, "Sawyer's work is like reading a collection of a wise philosopher's thoughts in a condensed Philosophy-for-Dummies format. Sawyer, at times aggressively, points out to you the directions on his own moral compass." (3336) However, of the same textual feature of the same novel, another reviewer wrote, "This story is a thinly veiled dissertation on ethics. There is more philosophical discussion than there is plot." (3481)[43] While the first reviewer enjoys *Rollback*'s philosophical digressions, the second reviewer does not.

This goes to show that there is little to no consensus; different reviewers may read the same text with different expectations, different preferences, and different opinions. If there is a single objectively correct way to read speculative fiction, one way or another, a significant portion of the reviewers in my sample are unaware of it--yet, as this chapter and the next will

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[43] For these two quotes, I have inferred the reviewer's overall opinion on the novel and how these particular statements fit into those opinions based on ratings and context.

show, that does not stop some reviewers from acting as though there is, perhaps mimicking the desire for a single objective reality that pervades technoscience.

The shifts in register were frequently noted in reviews that invoked didacticism, with complaints of novels reading like "a bunch of position pieces from the Electronic Frontier Foundation cobbled together into a story" (1241), "some overly technical/boring manual" (5472), "a lecture on civil liberties and the right to privacy thinly veiled as fiction" (1328), "practically a primer in some of the key concepts of modern science" (5415), "more [...] a Wikipedia entry than a gripping novel" (3249), "a didactic bore of a blog entry masquerading as a novel" (1310), "a sub rosa training manual for pro-tech pro-civil liberty pro-privacy activists of tomorrow" (1199), "a resistance field manual and a book of propaganda wrapped into one" (1304), "a story used as a teaching tool" (5440), "GRRM's recitation of the Westeros phonebook" (5210) and "a primer seemingly aimed at young people most of the time, introducing concepts from philosophy, math, and science in what can only be described as a somewhat entertaining and slightly subversive way" (5352).[44] When excessive exposition is used, then, a novel loses some of its right to claim the form of "novel," veering instead into other forms. This criticism implies that the transmission of speculative information cannot be the primary point of the texts; there is something that differentiates "a blog post" or "GRRM's recitation of the Westeros phonebook" from a satisfying novel-reading experience. The empirical repertoire, then, is here a sign of failure, where unmediated conveyance of information about the speculative world is insufficient. Instead, it is

[44] I have included this quote in this paragraph (of criticisms) because the book in question is *Anathem*, which is not Young Adult.

the *contingent* repertoire, wherein "actions are no longer depicted as generic responses to the realities of the natural world, but as the activities and judgements of specific individuals acting on the basis of their personal inclinations and particular social positions," that makes a novel a novel (Gilbert and Mulkay 1984: 57)--pointing to a clear limitation on the desirability of the empiricist repertoire in sf.

Yet some shifts in register were also considered fully acceptable. Praise included descriptions of the novels as "a manual to do exactly what Marcus does" (1198), serving "the same purpose as a textbook, teaching a subject, only it does it in a way that doesn't feel like so much work. If you're a bit of a nerd" (5544), "the most painless computer tutorial you'll ever have" (1205), "a nicely put together primer on security and security theatre" (1344), and "1/2 a gripping novel of life in a police state, 1/2 a how-to manual for maintaining your rights and sticking to the man in a police state" (1476). Didactic intent was sometimes welcomed, with reviewers noting that they "learn[ed] a tremendous amount" (4315), calling books "hugely interesting and educational" (2485) and "thought provoking" (4123), and celebrating that they "felt like I learned so much too! I kept having to take breaks to google different subjects discussed in this book." (1355) Intellectual stimulation and elevating the delivery of speculative information both function as features that can redeem an overly dry text.

Thus some of these books inspired reviewers to seek out more information to "better appreciate every historical reference in [the author's] amazing novels" (4136), and one reviewer advised potential readers of *Little Brother* to not "skip the afterward(s) [sic]. Or the bibliography for that matter." (1430) Pointing outside of the text itself can be one strategy to avoid the dreaded "infodump," which reviewers noted could kill plot momentum. For some reviewers, deviations from the novel form are not only acceptable but desirable when they provide context for or a

path to more (real world) information. Didacticism of this sort is by no means new to SF, as it was the direct aim of editor Hugo Gernsback when he founded his magazines. (Cheng 2012) As mentioned in the previous chapter, though, the style associated with Gernsback and, more broadly, didacticism in general was typically derided--but the infodump was perfectly acceptable.

Yet plot and narrative flow were overwhelmingly the context in which the exposition technique of temporality was brought up in reviews. This is particularly interesting because the relevant feature of temporality noted in the previous chapter was its tendency to present information as timeless or universal, yet this was never noted in a single review. Some reviewers implied the value of maintaining the specificity of actions directly depicted on the page by criticizing the use of lectures or dialogue as indirect narration of important events, but the presentation of information separate from the circumstances of its discovery or creation was never noted.

This is, I think, a deceptively important point. It suggests that presenting knowledge as universal has become so baked-in to how information is presented as to become invisible. The manipulation of temporality is discussed in the context of narrative choices, whether through the disjointed memories of *The Hundred Thousand Kingdoms* and the flashbacks of *Saturn's Children* or the times when "the protagonist (sounded like the author) broke narrative and explained in detail the technology" (1448) in *Little Brother*. One reviewer of *Saturn's Children* explicitly criticized Stross's decision to withhold until the climax

> ...a lot of fundamental information about the characters that would have, in another book, been introductory information provided early on and then recalled at the end. So there's a

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bunch of 'astonishing' reveals at the end (which I feel would have all been better as

character background), and the plot goes plop. (3803)

The implication of this quote is that the typical literary treatment of important information is to provide it early on in a context that downplays its importance, and then refer back to it when its importance becomes clear. This ordering is, interestingly, the opposite of the traditional discovery narrative--the quote shows the downside of novelty in the context of narrative flow. In terms of temporality, it shows how the author's decision of how to provide information disappears into other, and more explicitly literary, terms and structures when it is provided the way that much scientific information is provided: universalized, generalized, and removed from the context of its creation. To say it another way, the norm of freedom-from-bias (by universalizing speculative information) is invisible, and is only noticed when the *method* of providing that information draws the reader's attention.

Temporality is noted mostly when it becomes *visible*, whether by its manipulation of the flow of the narrative or by breaking from the conventions of when information is typically parsed out in literature. The quote above implies that information that changes the reader's understanding of the world, characters, or plot by being a "reveal" should more typically be presented in a different context early on, so that instead the recontextualization is the reveal. This scenario may well relate to the framing of science fiction as a game between reader and author (see "Focus and Didactic Tone" in the previous chapter).

Yet the distinction between information ordered as discovered and information provided as a given is an important differentiating feature between the empiricist and contingent repertoires described by Gilbert and Mulkay (1984). As much as the previous reviewer may have wanted to be able to metaphorically win the game being played by them and the author by

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realizing the reveal before the text presents it, the process of discovery as enacted in the book more closely resembles the contingent way scientists describe their own discoveries. Scientific papers present facts (conclusions) and then describe the process used to arrive at those facts, meaning that throughout the scientific paper the facts are known. Yet scientists describe the actual process of discovery as instead a movement from a state of ignorance to a state of knowledge based on their own insights and decisions. What the reviewer above suggests is that novels *should* do both, thus the nature of the game: the information must be available all along, but it must be dependent on the reader to make sense of it, taking features of both contingent and empiricist repertoires. Such a framing is invoked in several reviews as well, tracing the interplay between what the text says or does not say, what the author knows, and what the reader knows. For some readers, the pleasure of reading comes from figuring things out and keeping up with the author. One reviewer sums the dynamic up in their review of *Brasyl*, with my emphasis added:

> But now that I sit down to write my review, I find that I'm having a hard time in my head detailing exactly what about this book made me go gaga, versus the other two award-nominated SF books I've now reviewed (Jon Armstrong's Grey and Sean Williams' Astropolis: Saturn Returns); because frankly, all three books are thorough genre projects through and through, any of which can be held up by any fan in public while saying, "**This is what science-fiction is**." So what makes one so much better than the others, in my opinion? What are the tiny little things that make hardcore SF fans go crazy in the first place?
>
> So let's start, then, with a pretty important detail, one that non-fans might not even realize is a hallmark of the genre; **hardcore SF fans generally like their books to be**

kind of confusing at first, a game-like puzzle full of terms they don't yet understand,

a plot we're in the middle of without knowing the background yet, and they like to be

only slowly pulled into the necessary exposition of the story over the first half of that

novel. And that's something I can honestly say is a big difference between Brasyl and the

other two novels mentioned; that by picking his unknown technology carefully and

referring to them lightly, he doesn't overwhelm the reader into throwing down the book in

confusing disgust twenty pages into it (something I've heard online reviewers exactly say,

for example, about Saturn Returns), but by setting it in a hot and sweaty Rio de Janeiro

full of actual Portuguese hipster slang terms, he provides that exact sense of **confusion**

and puzzle-solving joy that hardcore fans like. (Psst -- don't forget there's a glossary at

the end.) (2404)

I have included this quote at length specifically for the references to puzzle-solving

(although it is not the only review to use that frame to discuss a reader's effort in reading; a

review of *Anathem* similarly recommends it for "those of us who like puzzles" [5571]). Puzzle-

solving ties both into some of the ways that specifically hard science-fiction has been theorized

(e.g. by Westfahl in *Cosmic Engineers*) and into how philosopher of science Thomas Kuhn

describes day-to-day scientific work within an existing paradigm. Kuhn (1962) describes, as he

titles chapter four of *The Structure of Scientific Revolutions*, "Normal Science as Puzzle-

Solving." These puzzles aren't meant to yield truly novel results--that is, results outside of the

expected range of answers under the current normal paradigm. Instead, Kuhn draws a distinction

between problems and puzzles, with problems as open-ended and puzzles as restrained by "rules

that limit both the nature of acceptable solutions and the steps by which they are to be obtained"

(Kuhn, 38). The latter, he argues, is the puzzle-solving of normal science; it also, in the quotes I

have provided, maps onto the puzzle-solving of hard science fiction. Rather than the range of acceptable solutions being limited by the rules of the natural world, however, in hard science fiction puzzle-solving the author must provide to the reader the tools by which the reader might come to the author's solution.

The *Saturn's Children* review provides a limit-case to this view of problem-solving. For that reviewer, the rules of "another book" (i.e. most other books) would indicate that a reveal at the end must be foreshadowed at the beginning to introduce what ultimately occurs into the range of acceptable solutions. This relates to the old chestnut of writing advice, Chekhov's gun, a figure of speech that generally says that, in a play, if a gun hangs above the mantle in the first act it should go off by the third. Generally this means that set design (and, in the context of the advice being given, narrative design) should only introduce important or sensitizing elements if they will play a role later on; the corollary of this is, of course, that if a gun goes off in the third act it should be above the mantle in the first. Using this lens, the *Saturn's Children* review can be read as indicating that Stross failed to put the gun above the mantle in a timely fashion.

In some cases, then, foreshadowing may be a form of empiricism--not in the context of authors providing evidence for their speculations, but authors providing *readers* with sufficient evidence to draw their own conclusions or note the importance of information. That can make reveals, or solutions, a source of pleasure for the reader. As one reviewer writes of Willis's *Blackout*:

> One thing I love about this author's work is the attention she devotes to absurd little details, and the comedic situations she constantly places her characters in. From some of the other reviews, this clearly isn't something that everybody enjoys, but I love how she throws a bunch of random stuff out there and still manages to bring it all together in the

end in a way that makes you go "Aha! So that's why she spent so much time going on about that stupid [insert random object here]". (4185)

A certain amount of alignment, then, is expected between readers and authors, and it is the text's duty to create that alignment. In the following section, I will discuss cases in which the alignment was or was not created by looking at instances where readers inferred or discussed author's credibility, both in terms of correct instances where authors were perceived to have *done the research* and faulty instances where authors were perceived to have provided insufficient or incorrect information.

Authors, Research, and the Replicability of Extrapolation

Readers made assertions about the text framed instead as the authors' actions even outside the context of textual features. For example, one review of *Feed* evaluates the worldbuilding by saying that "Grant's writing is well thought out and thoroughly researched providing for a very convincing post-apocalyptic future." (1913) In this case, although the sentence does technically take Grant's *writing* as its object, it is *Grant* who must have done the actions of thinking the world out and thoroughly researching, going beyond textual decisions discussed in the earlier section "Authors in Reviews."

On the other side, one critic of Bacigalupi's *The Windup Girl* asserts that "[i]t is so sad that the author didn't consult anyone who has any knowledge of alternative energy sources (or any technology or sciences)..." (297) There is no indication that the critic knows personally whether or not Bagicalupi consulted experts; instead, this phrasing can be interpreted as shorthand for doubting that Bagicalupi would have made the choices about the text that he did if he *had* consulted experts, who presumably would have rectified Bagicalupi's errors.

The Windup Girl provides a particularly interesting case as it had the same critique applied to its extrapolation by multiple reviewers: that its reliance on spring and biotechnologies failed to address the promise of other forms of alternate energy, such as solar, wind, and water (41, 90, 104, 153, 182, 230, as well as 297 above). The fact that so many reviewers within such a small sample identified the same factual critique suggests that a similar reasoning underlies them all.

Studies in the sociology and rhetoric of science may provide an explanation. The notion of replicability in science (i.e. the idea that results obtained by one scientist should be able to be replicated by any other scientist) ties into several other important notions in the sociology of science, such as the norm of universality (the idea that a scientific result must be equally valid in all circumstances). This norm, as shown by rhetoricians of science Gilbert and Mulkay, manifests in scientific writing as a deliberately impersonal style, "with overt references to the actions, choices and judgments of their authors being kept to a minimum" (Gilbert and Mulkay 42). This is referred to as the "empiricist repertoire" (55), which presents "highly abstract versions of scientists' research activities in the form of impersonal rules" (ibid.) to remove any perception of subjectivity. Indeed, the empiricist repertoire "portrays scientists' actions and beliefs as following unproblematically and inescapably from the empirical characteristics of an impersonal natural world" (56).

This is contrasted to the "contingent repertoire," which acknowledges that "their professional actions and scientific views could have been otherwise if their personal or social circumstances had been different" (57). This is, presumably, more subjective; yet it also implicitly maps the objective/subjective divide onto a binary of universality/particularity. Gilbert

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and Mulkay argue that scientists portray their own work as objective and universal by eliding their own subjectivities and the particular decisions they made.

The critique of *The Windup Girl*, then, can be viewed as a violation of this mess of objectivity/universality/replicability, as the reviewers in question do not find Bacigalupi's extrapolation to be replicable, since they would have done it differently. Instead, Bacigalupi's extrapolation becomes contingent on, for instance, him having failed to consult experts in alternative energy. Somehow, the text set up the expectation with readers that Bacigalupi's extrapolation was not only thought through but *exhaustive*, and so the idea that there are aspects of the extrapolation that were not accounted for breaks the readers' suspension of disbelief.

Critiques such as these can be interpreted through two norms: as a violation of freedom-from-bias, as Bacigalupi's contingent research practices are non-replicable and therefore biased, or as a violation of empiricism, as Bacigalupi failed to consider relevant evidence from the contemporary world in his extrapolation to his future.

Similarly, a review of *Feed* writes that

> this book is about social media and politics but appears to be written by someone who doesn't know anything about either. Every single thing she says about blogs makes me want to laugh and also throw the book against the wall. (She seems to think that in the future, people will be able to make a living by posting original poetry to the internet. Lolololol OKAY, GRANDMA, THAT CERTAINLY DOES SOUND PLAUSIBLE.)

> I seriously thought that the book must've been written by someone my mom's age, but apparently the author is, like, only two years older than me. (1945)

Here, again, we see disbelief equated with both authorial ignorance (empiricism) and contingency (freedom-from-bias). Grant is accused of not knowing anything about social media

or politics, and this failing would, to this reviewer, might be more forgivable for a certain *type* of person (playing into stereotypes about age and technological savvy). Authorial identity, credibility, and the specific thought processes of the reviewer are all tangled together. The credibility and sufficiency of explanations are highly contextualized. Similarly, the question of *what* is considered credible is deeply tied to *who* is considered credible, both philosophically in epistemology (see, e.g., Code (1991)'s *What Can She Know?*) and in practice among women and scientists of color (Williams, Phillips, and Hall (2014); (Subramaniam 2014)). In science, as in these reviews, the identity of the knower or speculator is context that impacts how legitimate that knowledge or speculation is.

The impact of context on credibility is not, though, the sole purview of authorial identity, such as gender and race; context may also depend on the reader. What counts as sufficient explanation for one reader may not be sufficient for another, and reviewers displayed an awareness of this. The most obvious example may be a recurring critique of *Cryoburn* that had nothing to do with authorial extrapolation and everything to do with the book being a relatively late entry in a long-running series. Some elements of or even in some cases the *entire* novel are highlighted as being difficult to understand or appreciate for readers who hadn't read other installments of the series (316, 409, 464, 483, 506, 574, 578, 594); and on the flip side of *that*, *Cryoburn*'s failure to address additional elements from elsewhere in the series was also seen as unsatisfactory to some (435). It is important to note here that *explanation* and *information* are not always synonymous, and several of the reviewers who critiqued *Cryoburn* did not say that an unfamiliar reader's suspension of disbelief would be broken, only that the reading experience would likely be unsatisfying; therefore not all critiques of exposition were tied to the norms I have identified or the social/technical binary.

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Reading previous books in a series, though, may not be sufficient, as multiple reviewers of Martin's *A Dance with Dragons* mentioned that they did not *re*read the previous books and therefore felt lost at times. At least one reviewer explicitly mentioned relying on Martin's character guide or even a third-party online wiki to keep track of who was who.[45]

The concordance of author and reader's visions also takes on sociological undertones in some reviews. Some readers relied on cultural explanations for their own failure to understand the author's intent; one reviewer said of Chabon's *Yiddish Policemen's Union* that they perhaps didn't "understand Jewish culture enough to get a lot of the jokes" (835), and another said that they felt "like this book was written exclusively for a Jewish audience. I really can't imagine enjoying it, or even understanding large swathes of it, without having a pretty strong background in Judaism, and a bit of Yiddish, and especially an understanding of the Jewish concept of messiah." (864) One reviewer attributed their difficulty understanding the quantum mechanics and language of *Brasyl* to being "a liberal arts major" (2615), explicitly tying their understanding or even *ability* to understand to their identity.

I argue that this shows a limit to the norm of rigor. Rigor in and of itself is not always desirable; it must be the right *kind* of rigor and rigor associated with the proper topic. A rigorous depiction of Jewish culture in *Yiddish Policemen's Union* is critiqued as alienating, and the rigor of quantum mechanics in *Brasyl* demands a certain kind of audience--one that is sufficiently knowledgeable. The fact that the cultural (i.e. social) familiarity with Jewish culture is critiqued

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[45] Indeed, for many of the books that contained extradiegetic materials such as glossaries, guides, and character lists, multiple reviewers expressed gratitude for these resources; there was also a not insignificant amount of critique for when those materials were incomplete, particularly the Portuguese glossary in *Brasyl* or the complete lack of one in *Embassytown*, or when ebook editions failed to indicate the existence of such resources.

for being overly narrow while the technical familiarity with quantum mechanics is excusable

strikes me as yet another display of the technical/social binary; it is unreasonable to expect

cultural rigor in SF but reasonable to expect technical rigor, despite the fact that both quantum

mechanics and Jewish culture should theoretically be treated with the same level of realism.

Specific facts and speculations are not the only subjects of alienating rigor. The

references to other works of science fiction were particularly noted as offputting. As one

reviewer of *Among Others* wrote,

> But there was something about the way the references were written (at the same time that
>
> lots of other things were explained and contextualized, such as Welsh culture and
>
> geography) that ended up making me feel like they were less about Mori and her love for
>
> books and more about the author nudging the reader in the ribs and going: "You do know
>
> that reference, right? What--you've never read that book? Oh well, guess you're not a part
>
> of my tribe, then. Too bad for you." I don't know; there's a certain irony in the fact that
>
> this book about isolation and ostracism is itself so deliberately isolating and ostracizing
>
> toward the readers who don't perfectly fit its target audience, you know? (4580)
>
> Another reviewer concurred, saying:
>
> Even if you have read Cat's Cradle (MANY TIMES), it may still mean nothing to you (IF
>
> YOU WEREN'T GIVEN ANY CONTEXT CLUES) until you look it up (AND FEEL
>
> LIKE A LOSER WHEN YOU DISCOVER IT'S FROM ONE OF YOUR FAVORITE
>
> BOOKS). It's incredibly alienating, and because so many of Mor's thoughts are encoded
>
> this way, if you're not up on your Le Guin, then it's impossible to understand what she's
>
> trying to get across when she compares herself to George Orr. (4704)

The notion of the science fiction references "encoding" Mor's thoughts speaks to one of the less tangible qualities of rigor: its reductivist focus on what can be considered to matter or be accepted as a necessary prerequisite. By using elements of other science fiction works, *Among Others* assumes that its preferred readership will have read the books Mor refers to and will be able to divine meaning from those references. This will be discussed more extensively in the next chapter.

On the other hand, successfully conveying information can make a reader feel as though they are part of a community or in a location that they aren't, as seen in this review of *Brasyl*: "Ian McDonald did his research for this one. You feel like you are part of the Brazilian culture, with Portuguese slang and complex cultural references. You will experience Brazilian candomblé ceremonies, and a history lesson on the Spanish conquest of the Amazon." (2562) Another reviewer says something similar of Bacigalupi's *The Windup Girl*, praising the way its meticulous details not only "help[ed] the reader to see the strange setting but also to make it extremely believable. I could smell things in this dark version of Bangkok, Thailand..." (36) By providing readers with precisely the evidence they need to construct the experience of being *in* these texts, the authors enact a certain form of empiricism that is the opposite of rigor--rather than assuming what must be known, it provides what it assumes is not known so that it *can* be known.

When authors make what readers perceive to be mistakes, though, they may be considered more or less forgivable. One critique, identified by the reviewer as a "nitpick," notes that in *Leviathan Wakes* "Eros is apparently a main belt asteroid. In the real world (solar system), it isn't! It's a Mars-crossing near-Earth asteroid. Did no one catch this? Or am I missing something?" (958) The fact that this is presented as a relatively small critique that does not

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interfere with the reviewer's overall enjoyment of the novel is noteworthy. Another reviewer of the same novel praises that

> the book makes takes [sic] human physiology into account. I find a lot of space SF unreadable because of the exquisite detail the authors pay to explaining a faster than light drive (or what not) without explaining how a body could live through being flatter than a sheet of paper. Though there is more handwaving about the medical stuff but only to an extent that biologists or medical types would be mildly irked. (1049)

For at least this reader, then, some errors are acceptable while others are not, and although it is a genre convention to allow certain kinds of errors ("how a body could live through being flatter than a sheet of paper"), that does not necessarily make it acceptable to the reader.[46] Furthermore, the way that the reader ties these conventions of believability and accepted departures from reality without breaking the suspension of disbelief is worth deeper investigation.

Gender, Genre, and the Technical/Social Binary

Reviewers regularly related their assessments of the novels back to genre and genre expectations. This ranged from contextualizing and qualifying their recommendations (such as 5326's review of *Anathem* saying that "I guess what I'm saying is that if you like hard SF, you won't find much better than this") to contextualizing and qualifying their criticisms (971's review

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[46] The distinction between the demands of rigor in physics and biology is interesting here; there are longstanding critiques of how STS has traditionally modeled objective scientific knowledge on physics (Code 1991), and sociologists suggest that how rigorous a scientific field is seen as is closely related to its gender makeup, with fields with more women seen as "softer." (Light et al. 2002).

of *Leviathan Wakes* disclaims that it "had a lot of detective novel in it, which is not my favorite"). Interestingly, some reviewers noted that although the novel they were reading was of one genre, they mostly read another genre with different conventions and acknowledged that their assessment might be holding the novel to the incorrect generic standards (2152).

Reviewers also acknowledged and interrogated claims of genre, sometimes arguing that a novel should be reclassified. As one reviewer of *Embassytown* said of their criticisms of its internal logic, "This wouldn't have bugged me if Embassytown were fantasy, but Mieville is clearly branching out into science fiction with this book. [...] Granted, this book wasn't 'about' such details, but my feeling is that in science fiction the technical stuff at least needs to feel believable." (2816) Even though the reviewer acknowledges that the "book wasn't 'about' such details," the failure of the novel to meet the standards of rigor of science fiction rather than fantasy is grounds for critique. Similarly, another reviewer says of *The Windup Girl*, "As science fiction the book is a failure - practically everything having even remotely something to do with science or technology is laughingly stupid and wrong." (297) Science fiction, this review implies, should have a certain amount of realism--when scientific or technological elements are adopted from the real world, they should be correct.

Genre also frequently shaped reviewers' expectations of the novel's treatment of gender. One reviewer of *Leviathan Wakes* identified the novel as a space opera, and then noted "Female characterization is a bit weak, but that's typical for the sub-genre," (1183) and another says the book "feels like a rollicking old-style adventure in many ways, but women are featured in that same old-style way, as props or impetus for men, if that makes sense." (1179) A reviewer of *Rollback* calls it "a bit sexist, but with science fiction writing you frequently have to put up with that I fear." (3309) Of *Saturn's Children*, another reviewer points out that "Classic SF was

criticized for poorly portraying females (when they appear at all) [...] this is one way around the problem: 'She's not a human female -- she's a sexbot!'" (3723) Another reviewer agrees that "If you read a lot of science fiction, you have probably read many, many books where the female characters pretty much exist to help out (and eventually sleep with) the male characters. [...] Well, Charles Stross doesn't even bother trying to hide; the protagonist is a sex robot, straight up." (3654) Another reviewer found that, while reading the book, "it's really hard to tell what's Oblivious White Dude Writing or a clumsy deconstruction of the fembot trope, and what's Freya being an unreliable narrator." (3716)[47]

All of these quotes tie genre to standards of believability on issues of gender. Certain subgenres (implied to be classic or hard science fiction) have simply accepted that women characters do not need to be held to the same standards of characterization as men, and for some of the reviewers this is acceptable (or at least not completely insufferable). The two reviewers of *Saturn's Children* implicate Stross, as the author, in these decisions, noting that he attempted to either naturalize or deconstruct the sexual role of his female main character.[48] Naturalizing Freya's sexual role is one way of taking the unrealistic element and rendering it realistic, by providing an explanation; critiquing it through deconstruction addresses the lack of realism by facing it head-on.

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[47] This is, naturally, a draw for at least one reviewer, who critiqued one edition that they felt failed to capture the spirit of the novel. The other edition they mention is preferable: "On this jacket, Freya's huge eyes, lips that would give Angelina Jolie pause, magnificent figure, and lovely hair make her look like exactly what she is: a creature designed to give exquisite pleasure to her masters. But the legs -- it's the legs that really catch your eye: they go on and on and on and ON from the far left of the front of the jacket, across the spine, and clear across the back, all the way to the inside of the back cover, where they terminate in large, beautiful feet. Now those are legs !" [sic] (3566)
[48] Indeed, this may also be author-specific rather than genre-specific, as one reviewer states "All I'm going to say is that I don't read Charles Stross for his female characters...or for the covers of his books. I mean man. Could you get a cover that makes me look more like a scifi nerd perv?" (3778)

The differing standards of realism--i.e. that the physics in science fiction must always reflect reality, while the characterization of women does not need to be treated with the same rigor--are unfortunately not limited to SF. Chanda Prescod-Weinstein defines white empiricism as "a predominantly white, predominantly male professional community selectively failing to apply the scientific method to themselves while using 'scientific' evaluation to strengthen the barriers to Black women's entry into physics." (Prescod-Weinstein 2020: 422) Prescod-Weinstein even notes that under white empiricism, "speculative white, male testimony is more highly valued than reality-based testimony from Black women" (Prescod-Weinstein 2020: 423-24); that is, in physics, when white men speculate about the reasons that Black women are disproportionately underrepresented, their speculation is taken more seriously than the Black women's testimony about their own experiences. The reviews discussed above display this dynamic institutionally built into certain subgenres of SF; hard science fiction's strict need for realism applies only to the (comfortably white and masculine) domain of science, and its lapses in social realism are accepted.

Using genre as an excuse, however, was not always successful. Some reviews critiqued "Female characters [that] are painfully narrow and reflect immature fantasy" (130) and situations where "the one woman who's allowed a perspective of her own quickly becomes the fantasy object of a man who then uses her like an inflatable security blanket while putting words in her mouth that have nothing to do with her and everything to do with him" (1108).

Some reviews simply removed texts from the SF genre altogether by reclassifying them as romance or Young Adult (YA). Although there is no widely-accepted genre categorization system to separate YA from adult literature, several of these classifications took me by surprise, and in general the novels that featured young or women protagonists were the most frequent

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targets (*Boneshaker*, *Among Others*, *Zoe's Tale*), while the two novels that were actively promoted as YA or for children[49] were lauded as transcending such a categorization.[50] The alignment of feminine qualities with nurturing and childcare is, of course, well documented, including in STS (Merchant 1980); it is easy to see how the arithmetic of "author is a woman + women nurture children = author wrote a book for children" can play out.

Although *Leviathan Wakes* is not categorically accused of *being* a romance, at least one reviewer (1128) complained of its "shoe-horned romance." *The Hundred Thousand Kingdoms*, on the other hand, is referred to by one reviewer as "much more like a paranormal romance than a 'high fantasy;' the romance was clearly more important than an [sic] any consistent, developed paranormal or fantasy elements" (2357), and another goes even further to say that it "Would be more appropriately marketed as a romance. This is not fantastical (aside from the presence of some gods), there is little (and very transparent) political scheming. Instead, the book focuses primarily on Yeine desiring a god and being filled by his god phallus." (2345) While I dispute that characterization of the book ("the presence of some gods," for instance, seems rather fantastical), the subtext of another review of the same book suggests that this gendered problem may also be genre'd, expressing their surprise that they "discovered fantasy is NOT necessarily the equivalent of a sci fi bodice ripper," (2156) which, much as the previous review positioned romance against fantasy, positions fantasy against science fiction. While there is much that can be said about the history of gendering romance in SF (see, for example, chapter four of Cheng

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[49] *Little Brother* and *The Graveyard Book*.
[50] I am not going to address the recurring categorization of *Feed* as YA, because that one seems to be GoodReads's fault, since GoodReads initially categorized it and promoted it as YA while the publisher did not. Additionally, several books that *were not YA* were discussed as if they were, albeit in the context of transcending the YA label.

(2012) for discussions about women and gender in the letters pages of pulps, including commentary by Isaac Asimov), what I find more interesting here in particular is the moving goalposts of gendered oppositions.

Although positioning fantasy as the more legitimate genre compared to romance and the less legitimate genre compared to science fiction may seem contradictory, I argue that Faulkner's construct of the technical/social binary can help us make sense of it. Specifically, it is worth noting that both imply that the problematic element is romance, which is implicitly gendered feminine, thus aligning that element with the "social" in the technical/social binary. In the first quote, the "masculine" element is fantasy, and so its "social" equivalent is romance; in the second quote, the "masculine" element is science fiction, and so initially its "social" equivalent is *fantasy*. Much like the evaluation of the "hardness" of sciences tends to be associated with how masculine its makeup is (Light, Benson-Greenwald, and Diekman 2022), this suggests a spectrum of masculinity for genres, with the binary opposition falling wherever is discursively convenient for the reviewer.

Multiple reviews reinforce the technical/social binary in other ways as well. Sometimes it's relatively straightforward: "I'm thrilled when I read a boy book that's filled with information and technology and the things that guys will voluntarily read about if they won't read about things like feelings" (1198) clearly opposes "information and technology" as a thing that "guys will voluntarily read about" against "feelings."[51]

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[51] It should be noted that education literature has long documented a literacy gap between girls and boys, and some have called for more books aimed at boys' interests to encourage them to read. See, for example, the 2015 report by Loveless (2015).

More reviews, however, drew a distinction between science or science fiction and elements having to do with social interaction, politics, or anything else "soft." These included calling *Anathem* "Social commentary in sci-fi clothing" (5308); noting that in *Rollback* "Mr. Sawyer doesn't go for the syrup too often, after all this is sci-fi, which concerns the alien message" (3436); categorizing *Julian Comstock* as "really more of a character novel than a Sci-Fi adventure" (4117); arguing that in *Boneshaker* "Despite zombies, airships, and all sorts of other mechanical wonders, the characters are what really drive the story" (2952); and calling *Leviathan Wakes* "scifi but told with an emphasis on people's stories rather than on the technology around them" (1130). In these reviews, "social commentary," "syrup," "characters," and "people's stories" are all distinguished from science fiction or at least framed as elements that cannot be assumed in this genre.

Lastly, I want to highlight an example of a previously-noted consequence of the technical/social binary, that women are consistently not taken seriously as knowers. The most striking quote in a review that I found on this front was from *Among Others*, one of the few books in my sample written by a woman (Jo Walton), where a reviewer said:

> But I found historical errors. Hey, you can write whatever history book you want and I won't notice, until you write about the history of science fiction and fantasy books!

> Her major error was referring to blue Pernese dragons as female! And after that, I distrusted things like when a particular book came out. And why the main character had never heard (read) about conventions before until someone mentioned them to her.

> So I feel like there was a big gigantic flaw in this book that I can't overlook. That she didn't do her research well enough. That if you're going to mention Pern more than once, you might want to have read one Pern book!

I also feel like beta readers should've caught that, if nothing else. (4617)

First, I find it interesting that a single error is escalated in this review to categorically stating that the author "didn't do her research well enough," and likely hadn't even "read one Pern book." Second, this single error shatters the reviewer's suspension of disbelief for all of the other book references in *Among Others* (a substantial element of the novel). Third, this apparently substantially impacted the reviewer's ability to enjoy the book. Walton, this review implies, failed to "do her research," or comply with the norm of empiricism, and so she could not be trusted on any other front.

The fact that this deep fracture of trust happened to a female author, I argue, is not a coincidence. While, as I showed in the previous section, traditionally masculinized genre tropes are accepted without breaking readers' suspension of disbelief, it seems likely in my analysis that readers of science fiction, and perhaps even speculative fiction more broadly, have been socialized to implement the technical/social binary in their assessment of texts.

Authors, as I argue in the next chapter, are well aware of this, and not exempt from participating in this boundary-work.

Chapter Five: Authors, Genre, and Norms

Introduction: The Case of Cherie Priest

As I researched this chapter, one particular incident stood out to me as a useful amalgam of all the points I intend to raise in this chapter. It encompasses boundary-work around genre and plausibility by the mis-application of science fiction's norms that both had a gendered effect (drawing attention to a woman author) and contained gendered subtext (devaluing what is perceived as feminine).

Priest notes the way the norm of realism was applied to her books even though it was not intended to be, nor marketed as, hard science fiction, and additionally many of the departures from reality were explicitly marked by her as discussed in Chapter Three:

> I get a great deal of email from people who have history concern. [sic] No, my husband says I need a page on my website called "Yes, I Know," just with the frequently asked questions or frequently made accusations, like "Yes, I know the Civil War didn't go on for nearly 20 years," "Yes, I know that this building wasn't built at that time, that these trains weren't in service, that there weren't any hydrogen power interventricles [s] or certainly not armored military ones at that time." So I get a lot of complaints from the history nerds. And I put disclaimers at the front and end of the books, typically, saying that I know... "Here are some of the things I did and if you are a true stickler for historic accuracy, these probably aren't the books for you," which in no way stops any of the hate mail. (Priest 2014)

The disclaimers Priest mentions, of course, are the same disclaimers noted in Chapter 3, in which Priest explicitly highlighted her deviations from the historical record and attempted to

forestall the emails which, based on this interview, she received anyway. Embedded in these emails is the idea that Priest was somehow unaware of details ranging from when certain trains were in service to the U.S. Civil War not lasting five times its actual length.

Yet it is not only fans who took issue with Priest's inaccuracy, as the interview goes on to show:

A couple years ago, I guess, [Charles Stross] did a blog post that was-bless his heart-kind of amounted to a lot of cane rattling and "You Steampunk kids, get off my lawn" and in it he called me out personally. He was complaining that Steampunk is supposed to be science fiction that it was not actually very scientific and as he makes his thesis statement, he says in parentheses "I'm looking at you, Cherie Priest, with your gas-powered zombies" and he linked me. And so it just flooded my page with traffic and the most traffic I've had in ages and I got to do a follow-up post that got even more traffic because I was teasing him back. I was like "Yeah, and God, he's right. If only I consulted more zombie scientists we could have avoided this whole embarrassing situation."

So it was all good natured fun and I didn't take it personally and we have since become friendly online and all is well. But the whole thing just cracked me up. It was hilarious. (Priest 2014)[52]

Stross's objection was less tied to historical accuracy and more focused on the expectation of rigor in science fiction. Though much of Stross's post in fact interrogates the

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[52] Recent discussions of the importance of "whisper networks" or informal circulation of information regarding poor behavior in contexts such as STEM suggest that the importance of this incident may well extend beyond whether Priest herself takes Stross's actions personally, particularly if other members of the community viewed the incident as a cautionary tale and adapted their own behavior accordingly.

steampunk aesthetic for its unquestioning acceptance of Victorian imperialist norms,[53] the

section in which he names Priest does indeed focus on science:

> The *Science!* in steampunk (which purports to be science fiction, of a kind...doesn't it?) is
>
> questionable at best (Cherie Priest, I'm looking at *your* gas-induced zombies) and
>
> frequently flimsier than even the worst junk that space opera borrows from the props
>
> department, because, as it happens, the taproots of steampunk lie prior to the vast
>
> expansion in the scientific enterprise that has come to dominate our era. But that's just
>
> about forgivable, inasmuch as much modern SF doesn't even like to *pretend* that
>
> sometimes a spaceship is just a spaceship, and not a metaphor. That leaves the
>
> aesthetic...which I can't find anything *intrinsically* wrong with, as long as steampunk is
>
> nothing more than what happens when goths discover brown. (Stross 2010)

Stross goes on to extrapolate what steampunk might look like if it took on all the political

baggage of the era, but I find his comment directed at Priest to be notable. First, he asserts that

steampunk "purports to be science fiction, of a kind...doesn't it?" and then finds the rigor of its--

and specifically *Priest's*--science to be lacking, worse even than "the worst junk that space opera

borrows from the props department."[54] This frames scientific accuracy as a good in and of itself,

and compares it to the debased subgenre of space opera, seemingly reluctantly admitting space

opera to science fiction. He then begrudgingly admits that he can't find anything intrinsically

wrong with steampunk as an aesthetic, describing it as "what happens when goths discover

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[53] I am compelled to note that he does not identify any steampunk that he considers to be insufficiently political; only Priest's work, which he identifies as being insufficiently *scientific*.

[54] The bifurcation between media and literary SF fandoms may also be at play here, with the demeaned "props department" belonging to less-desirable and more feminine media fandom.

brown"--a phrase, I must note, that appeared in an interview with Priest about steampunk before Stross's blog entry (Priest 2010b: 73). Priest attributes the quote to her friend Jess Nevins, so it is eminently possible that both Stross and Priest took the phrase from the same source--yet Priest admits the truth of the statement freely and goes on to describe the value of steampunk to the Goth scene while Stross wields it as "just another fashion trend riffing thoughtlessly off stuff that went away for a reason (at least in the developed world)." (Stross 2010) Stross's dismissal implies that an aesthetic in and of itself has no place in science fiction without scientific rigor and realism.

Yet Priest, in a blog post of her own in response, points out that the central conceit of rigor and realism is misapplied:

OMG YOU GUYS it has come to my attention that SOMEONE on the internet is pointing out that my fictional 19th century zombies are NOT SCIENTIFICALLY SOUND. Naturally, I am *crushed*. To think, IF ONLY I'd consulted with a zombologist or two before sitting down to write, I could've avoided ALL THIS EMBARRASSMENT.

If you've been heretofore unaware of my EGREGIOUS CRIMES against reason and scientific probability, but you would like to hop on the bandwagon criticizing my technique when it comes to MAKING SHIT UP about the pretend undead...then boy, have I got a proposal for YOU! (Priest 2010d)

Priest then goes on to encourage her critics to purchase, read, and analyze the sequel, along with the two additional contracted sequels, and "SUBMIT YOUR LETTERS OF CONCERN." But Priest's larger point, before taking the opportunity to promote her own books, is that the demand for accuracy in a speculative scenario is not in and of itself necessary. In doing so, she draws attention to the central tension of science fiction, potentially as distinct from

speculative fiction: all of the authors are, by definition, "MAKING SHIT UP." Stross's application of the norm of rigor is not only unwelcome and out-of-place; it is, in my reading, an attempt at boundary-work to purify science fiction of an insufficiently rigorous subgenre, and the gendered and raced boundary-work in technoscience lends the fact that it is aimed at a woman writer more weight than it might otherwise.

While Stross's blog post goes on to extrapolate what a more accurate steampunk might look like, he does so according to historical or sociological accuracy, *not* scientific:

> Forget wealthy aristocrats sipping tea in sophisticated London parlours; forget airship smugglers in the weird wild west. A revisionist mundane SF steampunk epic--mundane SF is the socialist realist movement within our tired post-revolutionary genre--would reflect the travails of the colonial peasants forced to labour under the guns of the white Europeans' Zeppelins, in a tropical paradise where severed human hands are currency and even suicide doesn't bring release from bondage. (Hey, this is steampunk--it needs zombies and zeppelins, right? Might as well pick Zombies for our single one impossible ingredient.) [...] The fading eyesight and mangled fingers of nine year olds forced to labour on steam-powered looms, weaving cloth for the rich. (Stross 2010)

While Stross provides other imagery, none contain any more scientific detail or even mention of technology, despite having explicitly taken up scientific accuracy as a criticism. Indeed, earlier on in his post he identifies the real problem with steampunk: "**there's too damn much of it about right now**" (emphasis his), continuing:

> We've been at this point before with other sub-genres, with cyberpunk and, more recently ~~paranormal romance~~ ~~fang fuckers~~ ~~bodice rippers with vamp~~ Sparkly Vampyres in Lurve; it's poised on the edge of over-exposure. Maybe it's on its way to becoming a new sub-

genre, or even a new shelf category in the bookstores. But in the meantime, it's over-

blown. (Stross 2010)

I point this out not to imply that a blog post should have the argumentative coherence of a

scholarly paper, but the shifting point is worth noting, particularly because of the comparisons to

cyberpunk and paranormal romance. The fact that "cyberpunk" is mentioned without any further

descriptors while paranormal romance is accompanied by demeaning descriptors such as "fang

fuckers," "bodice rippers with vamp[ires]," and "Sparkly Vampyrs in Lurve," all of which are

clearly references to *Twilight*. While this is only one sentence, the disproportionate insults

toward paranormal romance stand out in the context of *Twilight* being heavily gendered and

disdained (Driscoll 2012; Hills 2012; Gilbert 2012). In this sentence, Stross, deliberately or not,

reinforces a hierarchy of genres where paranormal romance clearly does not rate highly.

Cyberpunk, with its ties to masculine computing,[55] escapes the lambasting that paranormal

romancing does not.

With all that said, as Priest's initial quote in the interview indicates, Priest does not take

this gendered baggage personally; indeed, the answer was in response to a question asking why

she felt she "owe[s] Charlie Strauss a drink," to which she initially replied, "Oh, Charlie drinks

for free." (Priest 2014) The strong social ties in the SF community make this perhaps

unsurprising; it is similarly unsurprising, then, that China Miéville *also* took note of Stross's blog

post, telling *Lightspeed Magazine*:

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[55] While computing has not always been considered a masculine domain, currently the field is overwhelmingly full
of men; for a longer history of gender and computing, see Abbatte (2012).

Charlie Stross wrote his controversial article about steampunk as an exoneration of Victorian Imperialism, a nostalgia for a certain type of neglected empire, kind of "one more with feeling." And then a lot of people responded to that and felt he was being unfair. I think the fact of the argument is now out there and there are a lot of people writing, if you like, a kind of altermandialiste steampunk is very exciting. You know, I think that kind of argument can really rejuvenate and spark rethinkings of movements. And I hope that that happens. I hope we get the steampunk version of the Belgian Congo and the steampunk version of the 1857 Indian Uprising and all those things, to really interrogate some of the aesthetic assumptions in that field. (Miéville 2011)[56]

Miéville's comments seem fairly disconnected from Priest's. Even given the same provocation of Stross's blog post, Miéville and Priest seem to have taken completely different points as salient. Granted, Priest was explicitly called out by Stross on the topic of scientific accuracy, not political relevance; yet I find that, too, indicative of the ways that scientific rigor has been gendered. No author is criticized for politics, even though that critique forms the bulk of Stross's post; no insults are levied at cyberpunk; yet a female author is criticized for lack of rigor and the heavily-gendered subgenre of paranormal romance is dismissed as "bodice-rippers."

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[56] Miéville's *Perdido Street Station* (2000) is commonly classified as steampunk, and the interviewer's question is framed in terms of steampunk's growth as a genre since its publication. There is a much longer discussion about the history and aesthetics of steampunk to be had--the animated films of Hiyao Miyazaki, for example, date well before even *Perdido Street Station* and use steampunk aesthetics to interrogate themes such as colonialism and environmental degradation, and more recently there has been a rise in "silkpunk" literature such as the works of Neon Yang and Ken Liu, as well as Nisi Shawl's alternate history of the Congo *Everfair*.

I do not mean to imply that Stross formulated his argument to contain the maximum amount of gendered subtext per word, but his blog post falls within a larger pattern of behavior that applies across SF that reinforces both gendered enforcement of norms and gendered double standards. I use this anecdote as an illustration of the central tensions that this chapter will address: how authors make sense of genre, how authors anticipate their readers' needs, how authors make aesthetic choices about their work, how authors view and build the community around speculative fiction, and, finally, how authors think about the relationship between speculation and suspension of disbelief.

Authors, Genres, and Texts

Given the multiplicity of available definitions for SF and science fiction, the ways that authors discussed genre was of particular interest. As seen in previous chapters, genres are not value-neutral.

Sawyer defines science fiction as "the mainstream literature of an alternate reality" (Sawyer 2007a) Wilson similarly blurs the lines between mainstream literature and SF, noting that

> We say that science fiction asks the question, 'What if?' But I think what we're really asking is, 'What would it be like *if*? What would it mean to you or me *if*?' That's a literary question, and I hope I'm appealing to readers like myself, who don't see a discontinuity between science fiction and literature in general. (Wilson 2009c: 65-66)

Conceiving of science fiction in terms of *similarities* with mainstream literature is a notable departure from most traditional definitions, which aim to instead distinguish science fiction. Both Sawyer and Wilson invoke mainstream literature to emphasize the seriousness with which they approach their speculations. Sawyer's "mainstream literature of an alternate reality"

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proposes a unique standard of realism, with reference to a different coherent alternate reality, and Wilson aims to package hypotheticals in experiential--indeed, *empirical*--terms.

Nevertheless, both authors also emphasize the importance of science fiction's self-referential qualities. Sawyer notes that "Works of science fiction don't exist in isolation; they're in dialogue with each other" (Sawyer 2010). Wilson, on the other hand, extends the dialogue past simply science fiction, noting that "some of my novels are in dialogue with genres other than science fiction, which might make them seem more heterogeneous than they really are" (Wilson 2015). Both Abraham and Franck (collectively James S.A. Corey) acknowledge that *Leviathan Wakes* is in conversation with other works of science fiction, with Abraham claiming that they

> DA: Could hardly help being. We grew up reading the SF of the 1970s. Clarke and Asimov and Bester and Niven and Harrison. The whole crew. Those books formed our sense of the genre, and we riffed on them in our way. Now that we're done, hopefully there will be some folks who riff on our stuff moving forward. That's how the game gets played.

> TF: Well, the last three books [of the Expanse series] are my weird love letter to Ursula K. Le Guin, so no, that conversation never really stopped. (Corey 2022)

This echoes the megatext theory of science fiction discussed in Chapter Two: the idea of looking at science fiction as a web of interconnected references, tropes, and attitudes. Willis echoes this, providing a concrete example of one of these discussions, saying "Robert Heinlein wrote *Starship Troopers* and Joe Haldeman said 'That's not the way war is' with *The Forever War*; them William Tenn says that's wrong with *The Liberation of Earth*. It was a great period, the size allowed everybody to talk back and forth" (Willis 2017). However, this brings up the concern that if science fiction is a conversation, it is one that many people spent a long time

being systematically kept out of.[57] As discussed before, boundary-work of content inevitably includes boundary-work of communities and therefore people. The notion that some people are systemically left out of conversations has been well-documented in technoscience as well, such as in the context of gendered and raced citation gaps (Rubin 2022).

Wilson provides a gloss of hard science fiction, calling his work "at least hard-science-adjacent--it might bend conventional science beyond recognition, but it usually stops short of outright fantasy. (To say this in a different way, my fiction generally operates within a scientific ontology even when it skirts, bypasses, or strategically ignores particular laws of nature" (Wilson 2021). Sawyer agrees, calling himself "still very much a hard SF author: actual, real science is the backbone of my work" (Sawyer 2007a). Both quotes frame realism as key to, specifically, hard science fiction. "Real science" and "a scientific ontology" tie hard science fiction back to concepts that, as I have shown elsewhere in this dissertation, both embed whiteness and masculinity into readings of the natural world and disproportionately exclude women and people of color from being able to represent reality; this realism is not ideologically neutral.

However, Wilson and Sawyer are not alone in making ideology central to genre. In Walton's discussion of her decision to place a main character obsessed with science fiction into a fantasy novel, she teases out the distinction of ideological orientations of the genre, saying,

> Science Fiction has the viewpoint that whatever the problems are, they will be fixable, and they'll appreciate a rational, logical approach. Whereas in fantasy, generally things

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[57] The exclusion of women authors, in addition to what was discussed in Chapter Two, has been noted going back to the pulp era, when Boswell (2021) shows that as science fiction was becoming a consolidated field, women were systematically excluded from it.

are affected much more by will power, by being able to work it out. Science fiction has--

not necessarily the scientific worldview or the engineering worldview, but the idea that if

you try to tweak things, you can make a difference. Fantasy is much more--you're born

with the skill, you're special in this way. (Gentry 2013)

Science fiction as a *viewpoint* or *worldview* is not a theory unique to Walton, and though

she notes that it's "not *necessarily* the scientific worldview or the engineering worldview"

(emphasis added), the specific embedded values that she highlights are frequently associated

with science and engineering. Solvable problems, rationality, and logic are all among the traits

culturally associated with scientists and engineers (Koopman 2021).[58]

Bacigalupi expands on the idea of science fiction as a way of making meaning, although

he frames his statement aspirationally: "You want our genre to be perceived as the most relevant

of storytelling methods. That science fiction is specifically about our world and what's going on

with it, imposing a sense of meaning over that world that otherwise is muddy" (Bacigalupi

2011b: 54). Nevertheless, he also acknowledges the different meanings of the genre in different

contexts:

One of them is, where does this go, where will this book be placed in the bookshelves?

Which is one layer in discussing science fiction. And then there's this other layer which

is, what does it mean that you're science fiction? That's the one where it says science

fiction is rocket ships and Barsoom, and the sort of 1950s image of pulp, or maybe even a

1930s image of pulp science fiction is what's in people's minds when they say the words

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[58] See also previous discussions of hard sf as "a game."

"science fiction" as opposed to everything from David Weber to George Orwell.

(Bacigalupi 2011a)

The marketing of science fiction as a genre, according to Bacigalupi, is distinct from the meaning that science fiction holds culturally, which itself may be an oversimplified and incomplete view of what others would consider to be science fiction. Yet David Weber and George Orwell continue to be popular authors, highlighting the disconnect between what is being produced that *Bacigalupi* considers to be science fiction and what the *general public* thinks of when they say "science fiction." Yet he points to the power of science fiction--and specifically some of his works, including *The Windup Girl*--as providing a framework for meaning-making and understanding, saying that after reading it, "a reader might come back and then read about how Monsanto has sued some farmer for buying and planting unlabeled Monsanto seed and winning an IP infringement case. Now it's interesting, whereas before it would have been an abstract story" (Bacigalupi 2016). This concretization of the abstract allows science fiction to give readers "a language and a set of metaphors to talk about the hazards of our new social world" (Bacigalupi 2016).

Doctorow agrees, citing Daniel Dennett's description of "intuition pumps" to describe fiction as "when you have a little thought experiment that helps you think about what you should or would do if something were to happen. And then when it happens, you've got a framework or story for negotiating and living it. Fiction is an intuition pump" (Doctorow 2020). Though this particular quote is general to fiction, his application of it to science fiction is instructive, particularly since he cites instances where his work has inspired readers to become involved in the technologies he writes about, making the intuition pump real.

Inasmuch as science is about representations of and meaning-making about the natural world, then, SF would play a distinctly privileged role in Bacigalupi and Doctorow's views. SF is positioned as a way of making sense of possible natural and social worlds enabled by technoscience. Science fiction's role in this kind of meaning-making is well-documented, particularly in the context of governmental regulation and funding decisions (Hamilton 2003; Mulkay 1996; Mellor 2007; Stern 2004). There is also, though, evidence that science fiction does not only serve as a bridge between scientific and public domains, but is also used by scientists as an indirect means of providing commentary on technical work (Vertesi 2019).

Priest, on the other hand, locates the value of speculative fiction in a much wider domain, saying, "It's entertaining. I don't think it's required to be any more or less than that, but that's not to say it can't be--or isn't. Speculative fiction can be an interesting mirror, showing us what we're afraid of, what we want, what we hope" (Priest 2010c). Her view resonates with the findings in Chapter Four about form, in which multiple reviewers criticized moments when exposition drew attention away from the purpose of the novel--i.e., to entertain.

Despite what some may say, specific and accurate technoscientific predictions are generally accepted among the authors to *not* be a prerequisite for science fiction. As Ty Franck notes, "Historically speaking, SF writers have a terrible track record of actually predicting the future" (Corey 2022). This sentiment was echoed by Wilson (Wilson 2009b) and Miéville (Mieville 2012). One would think, however, that if the science were meant to be accurate in science fiction, the predictions would be expected to be as well; the fact that, at least among authors, this doesn't seem to be the case suggests that accurate science is not always the aim. Yet that itself raises the question: *why, then, is so much emphasis put on accuracy in some contexts*? I will return to this question later, in the section "Plausibility, and Not."

SF Protocols and Skills: Imagining the SF Audience

Several authors described SF or science fiction specifically as genres with unique

processes for making meaning from the text, which they referred to as protocols or skills. These

processes were also embedded in the idea of a text or genre being "accessible," presumably to

those readers who lacked the protocols or skills. This implies that the authors find something

unique about the way that SF makes meaning or signifies compared to other forms of literature.

Walton, when asked about her choice to reference science fiction books without deeper

explanation in *Among Others*, describes anticipating an audience with the proper "protocols" to

read them (Barnett 2012). Though she also notes that she read reviews written by those who

were unfamiliar with the novels referenced and found the book to be well-received in that group,

the language of SF being a genre requiring certain skills or protocols to read is not unique to

Walton.

Stephenson discusses deliberately writing *Anathem* to be:

accessible to habitual science fiction readers and non-science fiction readers alike. One of

the skills that science fiction readers develop, after reading a few thousand science fiction

novels, is picking up the details of a new world through a kind of osmosis. They just

plunge and start reading. Unfamiliar names and words appear. Slowly their subconscious

mind assembles a picture of the world. [...] But there are also many readers who are more

accustomed to books in which every word can be looked up in a dictionary, and they find

it distracting or even annoying to encounter new terms in a work of fiction. For them, I

included a glossary. Use it or not depending on what sort of reader you are. (Stephenson

2008)

Stephenson attributes this ability, to cope with the ambiguity of novel words and concepts, specifically to science fiction readers and actively contrasts their reading practices to those of "non-science fiction readers." The idea that this particular kind of language acquisition is unique to science fiction readers is an interesting one, although it could just as easily be a commentary on reading preferences and skill-building--that science fiction readers build the skill by tending to prefer books that do this. Yet this provides an example of an author acknowledging the ways that genre norms can be applied to *readers* as well; Stephenson's explicit description of softening the norm of empiricism (in this context, the idea that *readers* gather evidence from the *text* to build the world in their mind) by providing a glossary or guide is linked to allowing different kinds of readers into the text.

The process of enculturation into certain interpretive frameworks is, arguably, the point of STEM education. It extends not only to ways of interpreting the natural world, but also cultural ways of interpreting scientists' behavior, as seen in Subramaniam (2014). Subramaniam points out that displays of certain feminized emotions ("crying, displays of insecurity, confession, self-effacement, timidity, giggling") were viewed as weakness in the lab, while masculine emotions "were coded as revealing one's passion for the work. Faculty could yell, scream, or throw things in the labs in fury yet still be considered excellent scientists" (Subramaniam 2014: 168).

These interpretive frameworks are not made available or obvious to all participants in STEM education, either, as Subramaniam details in describing "the 'unwritten' rules of graduate education" (Subramaniam 2014: 190). And much as Walton and Stephenson express that their texts prefer certain audiences already familiar with the protocols being employed, Subramaniam

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notes that graduate school attrition may be due in part to uncultured students running up against the unwritten rules.

That said, Wilson characterizes certain types of science fiction as having a lower barrier to entry than others, suggesting that Walton and Stephenson's protocols may not span the entire genre. He points out the existence of "the kind of science fiction that delves deeply into those big issues, like Greg Egan's, though it's not something I would hand to a first-time science fiction reader. Egan's a great thinker, but you lose something *when you exclude a potential audience*" (Wilson 2009c: 66, emphasis added). The specifics of Egan's writing (although he is a noted hard science fiction author) are less important from this quote than the embedded notion that certain genres preclude certain audiences, and that the way to ameliorate the challenges faced by unfamiliar audiences is to strategically expose new readers to "easier" works before moving on to more challenging ones. This strategy is in pretty clear opposition to Stephenson's, as Stephenson implies that readers do not become more prepared to deal with certain topics, but instead become more adept at reading work they are unprepared for. Miéville, on the other hand, disagrees that reading protocols are unique to science fiction, arguing that such protocols structure "the vast majority of fiction" (Miéville 2012).

Daniel Abraham (one half of James S.A. Corey) mentions the decision to consciously avoid requiring the protocols of SF. He and Ty Franck (the other half of James S.A. Corey) were interested in

> making the books really, really, really accessible. We were really interested in going against the trend we saw at the time of science fiction being insular, science fiction being hard for readers to engage with; [where readers] didn't have the context of the last 20

years of sci-fi, but we were trying to make the books an on ramp for people who didn't

read science fiction. (Daniel Abraham 2021)

Scalzi, interviewed in *Lightspeed Magazine*, and his interviewer noted this dynamic of SF

becoming more insular as well:

[Q:] Years ago I heard you joke that you were part of a movement in science fiction

called the "New Comprehensible." Do you think that overall science fiction is too

inaccessible to new readers?

[A:] We have some of the best writers in science fiction and fantasy today that we've ever

had in the genre. That said, one of the things is that when you have people who are really

engaged on the literary side of writing, as many of our current really excellent writers are,

there is a question of how approachable it is to someone who is just coming fresh into the

field. (Scalzi 2012)

This is an interesting reversal of Abraham's point: that excessive *literary* stylings might

put off readers new to science fiction. The importance of style to genre, and particularly the ways

that genre fiction (including speculative fiction as an umbrella term covering science fiction and

fantasy, as well as mystery, romance, horror, or anything else not classified as literary fiction) is

defined in opposition to literary fiction, is another recurring theme through the interviews.

Style, Genre, and Gender

The association of a particular style with a particular genre has been noted in other works,

particularly ones focused on hard science fiction, New Wave SF, and particularly works drawing

distinctions between them (Hartwell 1994; Taylor 1990; Roberts 2016). Much of this treatment

associates hard science fiction with straightforward prose but a reliance on jargon and

explanation, and New Wave with experimental or literary stylings. Far from being relegated to

critical examinations of SF, these questions of genre and style pervade the way authors discuss their work.

When asked about the choice to employ stream-of-consciousness in *The Hundred Thousand Kingdoms*, Jemisin pointed out that it's

> not really rare in literary fiction, or more literary-oriented fantasy subgenres (e.g. slipstream, New Weird). I went with it because that was how the story needed to be told. I tried an earlier version in a *straightforward, didactic third person limited*, and it just didn't convey the character complexity that I needed. (Jemisin 2010b, emphasis added)

The description of stream-of-consciousness as "literary" is here contrasted with third person limited point-of-view, which Jemisin categorizes as "straightforward" and "didactic." This characterization resonates with McGurl's description of limited third-person in his social history of creative writing programs, particularly the way it embeds objectivity into style:

> In staging a *limitation* of knowledge--a substantial eclipse of the omniscience whose display, by logical implication, is always an option for the godlike author--it purports to *gain* something. What is gained is, among other things, "experiential intensity." This intensity is shared by diegetically-embodied first person narrators who speak "from experience" but is in theory improved by the removal of this speaking in favor of an ironically more direct, because disinterested, narration-from-without. (In third person limited narration, that is, we see what the character *really* feels, not what he *says* he feels.) (McGurl 2009: 142)

This move--staging a very particular type of limitation of knowledge in order to gain credibility rooted in characters' experiences--displays one way that empiricism is baked into limited third-person prose. (See chapter 3 for a longer discussion of style in exposition.) Jemisin

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notes, however, that this disinterest comes at the cost of character complexity. Yet the realism afforded by third-person limited point of view is favored by other authors for precisely its empiricism, as Martin discusses:

> I'm a strong believer in telling stories through a limited but very tight third person point of view. I have used other techniques during my career, like the first person or the omniscient view point, but I actually hate the omniscient viewpoint. None of us have an omniscient viewpoint; we are alone in the universe. We hear what we can hear...we are very limited. (Martin 2012)

Martin, therefore, employs limited third-person to better recreate the experience of a person in the world, cut off from omniscience. Interestingly, Martin does not comment on the potential use of first-person, which would theoretically model an individual's experience of the world even more closely at the expense of a more journalistic, impersonal style like that used in scientific papers (Gilbert and Mulkay 1984).

> Sawyer takes the point somewhat broader, to say of fiction as a whole that
>
> Prose fiction is the only form that actually gets you into the head of another character. Through the use of limited point-of-view--either first- or third-person--the reader *becomes* a character in the story, seeing only what that character sees, feeling only what that character feels, knowing only what the character knows. It creates identification, not just in the literary but also the psychological sense. (Sawyer 2008a)

Sawyer's point here that prose fiction collapses any distance between reader and character is, I think, problematic. It relies on the assumption that viewpoints are inherently attainable and interchangeable; that there is no experience which is incomprehensible for any other person. It's an odd, solipsistic kind of universalism, stating that any reader can get "into the head of" a

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character. After all, a god-trick that sees everything from anywhere is as much a god-trick as that which sees everything from nowhere--or, as Haraway says, "Relativism is a way of being nowhere while claiming to be everywhere equally" (Haraway 1988: 191).

And, ironically, another author suggests that the value of prose fiction is *the opposite* of Sawyer's suggestion. Wilson employed first-person limited in *Julian Comstock* very deliberately to induce irony between the reader, the events in the text, and the narrator, Adam. An attentive reader may notice things that go well over Adam's head (such as Julian's homosexuality), and in an interview Wilson acknowledges that this was deliberate, saying that the irony "creates a sort of ghostly three-way dialog between the objective circumstances of the story, the narrator's perception of those circumstances, and the reader's reaction to both" (Wilson 2009a). Rather than the passive inhabitant of the character's mind proposed by Sawyer, Wilson portrays a reader who actively constructs the world outside of the character's understanding. He also extends this externality of readers' construction to characters and, in fiction, the future:

It's one of those mesmeric tricks fiction does. As soon as a reader says, "Don't be so pessimistic, Watson, I think you're underestimating Holmes," the trance is fully induced. Because you don't argue with Watson unless, on some level, you've constructed Watson in your mind; you don't second-guess his opinion of Holmes unless you've done the same with Holmes. They start to hover over the text, holographically, if you see what I mean.

In science fiction, the same effect gives a neat little triangulation on whatever future you're postulating. I think that's the key element H.G. Wells brought to science fiction--the implicit understanding that present-day London is simultaneously someone's

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dream of a gaudy future and someone else's haunted ruin, and that each of those

viewpoints is equally legitimate. (Wilson 2009a)

This instability, or perhaps invitation to multiple interpretations, is incommensurable with

the norm of objectivity in the sense of freedom from bias. If *both* interpretations of London are

equally legitimate, to use Wilson's metaphor, then there is no single unbiased interpretation.

While this situation is arguably a realist's nightmare, it also reinforces much of the discussion in

Chapter Four regarding the relationship between author, text, and reader.

The reader's awareness of the text through the characters "hover[ing] over it" can be

translated into textual features through what Valente calls the "conventional wisdom [...] that

style should be transparent: a window through which the reader views the novel." (Valente n.d.)

She further identifies it as "the standard 'muscular' Hemingway-with-lasers style so common to

SF," contrasted to the description of her own prose as "flowery" or "frilly," which she has

"occasionally wondered whether it has more to do with being a woman who writes in something

other than" that style (Valente n.d.).

Valente is far from the only author to note the role of the author's identity in the

evaluation of SF works. Perhaps the most vivid is Jemisin's account of facing veiled racism in

attempting to publish her first novel, *The Killing Moon*:

I can read the subtext. I can hear the unspoken. And when someone is saying that, you

know...The Killing Moon is a bog-standard fantasy novel in every way except that it

takes place in Egypt and has an almost entirely black cast. It was third person. It was very

traditionally shaped. There was a quest. There were bad guys. It was as traditional as I

could make it without putting it in a very traditional medieval European setting, and

giving it a white male protagonist instead of two black men and one black woman. And,

so when I hear these statements like, "I'm not sure how to sell this. I'm not sure who its audience would be," the assumption, the implication of that is, "I don't think its audience would be the existing fantasy readership, and I don't think the existing fantasy readership would buy this book." And I was angry about that because it just kind of smacked of the whole, "We're not racist. They're racist. We don't discriminate. They would discriminate. We're just trying to look out for you." And I think pretty much every person of color has encountered that kind of attitude and those kinds of excuses at some point. (Jemisin 2016)

This quote illustrates a nexus of interrelated points. First, Jemisin notes that she interprets publishers' comments about *The Killing Moon* to be pretextual, as *The Killing Moon* is traditional fantasy in all ways but setting and race. The factors she identifies as belonging to fantasy include "third person," "traditionally shaped," having "a quest" and "bad guys." This leads her to conclude that the publishers don't believe the traditional fantasy readership would read an otherwise-traditional fantasy book written by and about black people--a reflection of how Jemisin, as a black woman, is socially marked in a way that causes publishers to frame her work as intended for similarly marked audiences rather than unmarked ones.

Jemisin also notes that she received advice from other writers of color that fantasy as a genre and community "did not want writers of color writing about characters of color" (Jemisin 2016). That comment is also mirrored in her earlier observation that publishers seemed to be blaming the fantasy readership for being insufficiently interested. When asked in another interview if the hunger for new (and black) perspectives have contributed to her success, Jemisin points out that books by black women tend to have "*diminished* sales, as the writer's work gets stereotyped and qualified and shoehorned into little boxes that keep it from getting the

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mainstream attention necessary to succeed" (Jemisin 2011). Gendered and raced wage gaps are,

of course, also seen in STEM, and some work suggests that the technical/social binary may

impact gaps in pay for different positions as well (Cech 2013).

In addition to sales, though, the author's identity is perceived to impact critical reception.

Walton points out that Bujold's work is consistently dismissed (along with C.J. Cherryh's) and,

when asked why, suggests, "Girl cooties? That's one possible explanation" (Gentry 2013).[59]

Valente points out that due to being considered "not...sufficiently hardcore by the male reading

public," authors of fairy tales (such as herself) have trouble being taken seriously. Much of the

impact of gender, though, is "too subtle to call out--awards ballots and behind the scenes

selection processes. I sometimes wonder how my career would have been different if I had

published under **C.M. Valente**..." (Valente 2007).

The history of women writing speculative fiction under un-gendered pseudonyms is, of

course, rich and well-documented (see, e.g., Badami (1976)), and the tendency to gender certain

genres as feminine--and to recategorize works by women *into* those genres--is supported by

other interviews. Bujold notes that publishing first in military sci-fi gave her a career advantage

compared to if her works had "been classified as Romance or Young Adult, both arenas in which

women writers were constantly dismissed" (Bujold 2009).[60] She also notes, after being praised in

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[59] One review also noted how Bujold's science fiction is devalued, praising it and calling it "true soft SF of the sort Ursula LeGuin writes, extrapolating futures frightening for how very human they are. [...] There is nothing didactic about her writing, and the social extrapolation is always either essential to the plot (in which case you can look at it as purely plot-related) or done in small asides that, if you are racing to get to the end, are very easy to overlook." (301)

[60] Based on context (the question asked if entering "the male-dominated genre of military SF" had an effect on her work), I am interpreting Bujold's "in" as "*into*"; i.e. Romance and YA as arenas *into which* women writers were consistently dismissed.

an interview question for writing "the male 'it seemed like a good idea at the time' thought process' scarily well," that "Every once in a while--a couple of times a year--I still get nonplussed notes from male readers, sometimes quite long-time ones, who've just found out I'm a woman. I have not, to my knowledge, ever had a female reader make that mistake" (Bujold 2010a). This statement points to an asymmetry in the gendering of certain writing choices or styles, in that the interviewer implies that masculinity has a monopoly on impulsive poor decision-making, which Bujold rejects. She notes that that assumption of masculinity is shared by a fairly stable contingent of readers who find themselves "nonplussed" that Bujold is a woman, while women readers do not, in her experience, share that default association. Masculinity-as-default has an extensive history in technoscience, both in terms of representation (Koopman 2021; Steinke et al. 2007) and epistemology (Code 1991; Haraway 1997; Prescod-Weinstein 2020).

Yet the Young Adult (YA) issue is recurring among women writers. Walton and Priest both actively clarify that their works are *not* YA, a miscategorization that also appeared in reviews (Walton 2010: 77; Priest 2010a). Priest notes that there was "a great deal of very awesome young adult crossover, for which I am immensely grateful," and Walton says that "I like YA, but this is not YA; it's a book for people who used to be teenagers" (Ibid.). Although Grant did not comment on *Feed*'s categorization, one review pointed to it being listed in a YA Debut Authors Challenge in 2010 on Goodreads and others expressed surprise at this categorization.[61]

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[61] I have not been able to verify this.

It is worth noting, in contrast, that Willis expresses the *benefits* that she's received from being a woman in science fiction, calling science fiction is "basically a meritocracy field, as writing is" (Willis 2013). This led to her being invited to take part in anthologies that needed a woman. But although she calls writing "a meritocracy," she also acknowledges that "Certainly, there are a lot of jerks. And there are people who dismiss me out of hand for being a woman, and that sort of thing" (Willis 2013). The contradiction between writing being meritocratic and being dismissed out of hand for being a woman is not explored in these interviews; however, research has shown that in the context of engineering education, enculturation into the individualistic and meritocratic ideals of engineering goes hand-in-hand with the depoliticization of inequalities (Seron et al. 2018).

Willis also described the pushback she received at WisCon, a feminist science fiction convention, for writing about

> housewives as heroines. They felt I was betraying the sisterhood. And they told me a number of things they thought I should fix in my writing because I had an obligation to write about women's issues. And I was like, *every* issue is a goddammed [sic] women's issue. I'll write about whatever I want. I didn't go through the raising of my consciousness in order to switch from letting men tell me what to do to letting *you* tell me what to do." (Willis 2013)

In this quote, Willis rejects the gendering of specific issues and the notion that writing about domesticity is inherently demeaning to women.[62] The devaluation of the feminine can play

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[62] For a more thorough treatment of domesticity and the history of science fiction, see Yaszek's *Galactic Suburbia*.

out more directly than through criticism of texts or narrative experiences, as Willis pointed out above when describing being "dismiss[ed] out of hand for being a woman" (Talking Writing). This dismissal is not only seen by women authors. In an interview with author Mary Robinette Kowal in Tor.com in 2020, Scalzi asks,

> If you are not completely out of, just completely biased in ways that are not understandable, can you make the argument that, for example Nora [Jemisin], isn't one of our best writers? Can we make the argument that [Mary Robinette Kowal's] *the Calculating Stars* did not deserve the sweep that it made last year?

> MRK: Well, I can certainly tell you from things that I've read that there are many people who would make that argument.

> JS: Yeah, but they're bad arguments and that's the whole thing. (Scalzi 2020)

Scalzi implies here that true freedom from bias would require audiences to acknowledge that Jemisin and Kowal are excellent SF writers, and indeed they have been awarded multiple Hugos each; yet Kowal pushes back and points out that plenty of people do *not* acknowledge that. Although Scalzi counters in return that arguing Jemisin and Kowal are anything less than deserving of their praise is simply specious, the fact that it does happen speaks to a consistent devaluation and dismissal of work by women in SF that parallels the devaluation of women in STEM (Moss-Racusin et al. 2012; Ecklund, Lincoln, and Tansey 2012; Fox 2001; Lincoln et al. 2012).

That this dialogue took place in 2020 has meaning beyond just the reference to *The Calculating Stars*. Jemisin, it should be noted, faced incredible backlash as part of the Puppies' campaign, which affects the subtext of Scalzi's use of her as an example.

To be fair, gender may intersect with genre in ways beyond merely relegating "feminine" works or works by women authors to less desirable genres. Bacigalupi followed *The Windup Girl* with a YA novel, *Shipbreaker*, that he explicitly aimed at young boy readers.[63] YA as a genre, he notes, tends to cater to girl readers, and he advocates for "more trashy boys' fiction in the YA space, on the assumption that much like *Gossip Girl* in the girls' space, it's not going to be the last book they read, it's going to be the first one" (Bacigalupi 2011a).

Genre Prestige and Community

This characterization of certain literature as "trashy" brings up issues of genre prestige, which are clearly front-of-mind for many authors. Sawyer discusses deliberately nudging his work closer to the mainstream, because "although I was getting favorably noticed by SF readers, I was finding it impossible to get non-SF readers to read books that had starships or intelligent dinosaurs on the cover" (Sawyer 2007b). Abraham invokes a certain audience for whom "writing low-prestige literature (science fiction, fantasy, genre stuff) offends them. These are the folks who say bestselling books are crap" (Corey 2013: 48). This quote conflates several values structures in SF and literature in general--the notion of prestige, the notion of genre, and the notion of popularity. Abraham's quote comes after identifying a contemporary trend in genre fiction towards "a tremendous stigma about being unsophisticated," and a rejection of sentimentality in favor of being "serious" and "joyless"[64] (Corey 2013: 48). The definition of

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[63] Education research, particularly on literacy, has documented the impact that cultural demands of masculinity have had on boys' reading; see [a bunch of citations I'll put in later].
[64] Note the parallels to the Puppies' rhetoric about "message fic" discussed in Chapter Two.

science fiction in contrast to the literary ideals of what Abraham would call high-prestige literature dates back to at least the 1960s and the New Wave (see Chapter Two).

Bujold identifies a more practical aspect of debates over prestige: "Besides the usual scramble for a higher place in the virtual pecking order on the part of readers, there is also an underlying competition for audience and sales on the part of writers and publishers, which can get quite tense" (Bujold 2009). McDonald refers to turf wars, invoking "Literary Sharks and Jets" (McDonald 2006), noting authors who straddle the literary-SF divide and commenting that SF is "seen as a childish genre. Of course, if an SF breakout books [sic] succeeds, then, in the lines of great Kingsley Amis [...]

> *SF's no good*
>
> *They bellow till we're deaf.*
>
> *But his looks good!*
>
> *Well, then it's not SF.* (McDonald 2006)

The genre discrimination arguably goes both ways, at least in some instances, as Wilson points out a "long tradition of mainstream literary writers occasionally attempting to write science fiction and doing things clumsily that science fiction writers have painstakingly learned not to do clumsily" (Wilson 2009c: 67). And there is also policing between subgenres beneath the umbrella of SF, despite, as Willis notes, serving entirely different purposes:

> All genres are tools. One of my pet rants for years has been the idea that there's no such thing as a good western, or romance, or any other form. We in the SF world are as guilty of this as anybody else. I've seen science fiction people who look down on fantasy people, who look down on the romance people. (I don't know what's below romance-- probably confessions, and then porn.) (Willis 2009)

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The notion that genre affiliation may be at least as much a power play as a literary form is worth serious consideration, particularly since it would account for the boundary-work occurring in both directions. It is also worth noting that Willis's implied ranking of genres puts the most technical genre, science fiction, at the top and progressively more social genres, from fantasy down to porn, at the bottom.

Not only does this reinscribe the hierarchy of prestige according to a spectrum built along the technical/social binary (one that corresponds to the spectrum of hardness in science described by Light, Benson-Greenwald, and Diekman (2022)), but it suggests that the enactment of the technical/social binary plays an important role in legitimating science fiction. If science fiction cannot (or will not) be legitimated according to literary qualities, then it can nevertheless be legitimated by appealing to science. Thus literary legitimacy is disallowed in science fiction, because the technical/social binary legitimates the technical by constructing it *against* the social (Faulkner 2007).

Yet so far this boundary-work has been described by authors who clearly align themselves with SF. Chabon, then, provides a unique perspective as a largely mainstream literary author who also won the Hugo--risking being one among Wilson's long tradition. He notes that SF is not the only genre to police itself, saying that "People who are writing what they think of as 'serious literary fiction'--and I'm always putting that in quotation marks--are almost self-policing, self-censoring in a way that well-behaved children often tend to be" (Chabon 2003). Yet, on the other hand, he also says:

> It's quite obvious to me that so much of what goes on in the world of science fiction has
> analogies with a ghetto mentality, with a sense of clannishness and that ambivalence that
> you have: on the one hand wanting to keep outsiders *out* and identify all the insiders with

a special language and jargon so you can tell at a glance who does and doesn't belong, and on the other hand hating that sense of confinement, wanting to move beyond the walls of the ghetto and find wider acceptance. (Chabon 2004)

Chabon is hardly the first to refer to the "genre ghetto," a term that is malleable but typically includes speculative fiction, mystery, and romance--i.e. anything *not* shelved in the un-adjectived "Literature" section of a bookstore. Yet Chabon describes a two-sided dynamic that aligns with the ways that other authors discussed genre policing, in terms of both wanting to maintain a certain kind of community with a certain kind of person and to receive wider recognition beyond the confines of the field.

Though Chabon describes both sides in terms of rather nebulous groups of people, authors in their interviews noted both the history of notable gatekeepers in speculative fiction and the ways that formal gatekeeping continues. Bacigalupi identifies editors as gatekeepers, relating his experiences getting short story submissions rejected:

The rejections had less to do with the quality of the stories, and a lot to do with how they would categorize, and where they would fit into various market segments, and in one memorable case, I was rejected by an editor because, as she put it, "As a mother, this story disturbs me." All of that was a bit of an eye-opener for me, because when I started out writing, I was so sure that if I just wrote a great story, that was all that mattered. I didn't really understand the business end of the book-selling equation. (Bacigalupi 2004)

The importance of editors, and editorial *taste*, in determining what does or does not get published has implications for genre as well. Bacigalupi does not provide details of his rejection for a story that disturbed the editor, but it is worth noting that it is common practice for editors to

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reject stories that don't align with the genre or goals that the market claims.[65] Bacigalupi's framing of this anecdote implies that quality should be objective, i.e. free-from-bias, rather than personal and subjective; another enactment of that norm. But he is not the only author to have run into editorial roadblocks; Gaiman muses that when he was young, there were only two places he could submit his fiction to: "You had Imagine magazine, the Dungeons and Dragons magazine, and you had Interzone, which meant that you had Gatekeepers--the editor of Imagine and the editor of Interzone, or the editorial board of Interzone. And if you didn't get it through there..." (Gaiman 2009). The positioning of editors-as-gatekeepers not only invokes boundary-work, but it also harkens to specific ways that the sciences engage in boundary-work by, e.g., employing weed-out courses (Subramaniam 2014: 161).

Editorial oversight has, in addition to dashing the hopes of many an aspiring author, had a significant role in the development of especially science fiction as a genre, as I described in Chapter Two. The authors were not unaware of this, since Scalzi located the tradition of the importance of editors in

> [T]he Golden Age of science fiction, because a particular editor or a particular small
> group of editors [...] were very much at the top of the food chain. They were the people
> that you would submit to first. And then, if they didn't take it, then it would link down.
> [...] There was still stuff around the margins of that, but the main thrust of the commercial
> aspect of science fiction and fantasy was distinctly colored by that. (Scalzi 2020)

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[65] These may be magazines that publish limited demographics, such as FIYAH!, which publishes only Black authors, or Anathema, which publishes authors of color; but they may also be magazines that focus on a specific topic or subgenre, such as Beneath Ceaseless Skies, which only publishes second-world fantasy, or even Mermaids Monthly, which only publishes mermaid stories (with the exception of a selkie special issue).

The editors Scalzi refers to are likely Hugo Gernsback and especially John W. Campbell, as he previously noted in that same interview that they wanted "a competent man, we want highly technical stuff, and we want it to have a particular agenda" (Scalzi 2020).[66] These editors may well have contributed to the technical/social binary becoming embedded in science fiction from its earliest days, particularly with their early emphasis on scientific plausibility.

Plausibility, And Not

Plausibility takes two forms under scientific norms: realism, in the portrayal of speculative elements that could be scientifically accepted, and empiricism, in the background research or extrapolation that an author does. Both feature heavily in author interviews.

Indeed, plausibility in both forms can sometimes form the impetus for a novel. Mira Grant wrote *Feed* because "I love zombies and I love epidemiology, and my problem with a lot of zombie fiction is that 'well, it was a disease' seems like an easy answer, but really isn't. So I started thinking about what sort of a disease you'd need to actually have a zombie apocalypse..." (Grant n.d.). The gap between the surface-level plausibility of disease-induced zombification and the true implausibility, in Grant's case, fueled a novel. To close this gap, Grant conducted research and consulted experts:

> In order to come up with the Kellis-Amberlee virus, I read enough books on viruses to qualify for some kind of horrible extra credit program, audited a bunch of courses at UC Berkeley and at the California Academy of sciences, and then started phoning the CDC

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[66] For more on science fiction, science, and the "competent man" see (Huntington 2006; Allen 2009; Koopman 2021).

persistently and asking them horrible questions. [...] So every time I came up with a new iteration of Kellis-Amberlee, I would call [the CDC] back and say, "If I did this, this, this, this, this and this, could I raise the dead?" And every single time they would say, "No." And I'd say, "OK," hang up, and go back to working. After about the 17th time, I called and asid, "If I did this, this, this, this, this, this and this, could I raise the dead?" And got, "Don't...don't do that." At that point, I knew I had a viable virus. (McGuire 2012)

The way that Grant produces the feasibility of the Kellis-Amberlee virus takes its legitimacy from both academic sources (auditing courses and reading books) and nonacademic expert sources (the CDC).[67] It likely helps that, as she admits, her "interest in disease is a hobby!" (Grant 2010)

Multiple authors similarly expressed a joy in doing research for research's own sake, taking the norm of empiricism to an extreme. This can sometimes be detrimental to the final product, as Willis notes, saying that

Research is a lot more fun than writing. I could go on looking things up forever, and sometimes that's a problem. There's always a tendency to put stuff in a story whether it belongs there or not, just because you spent all that time researching it, as in "I spent *months* studying fourteenth-century weaving, and by God, you're going to sit there and listen to it." (Willis 2012)

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[67] Grant did not obtain access to the experts at the CDC simply by virtue of being a science fiction writer; she describes in the omitted section of the quote how a song she had previously written about the Black Death (called, unsurprisingly, "The Black Death") gained her goodwill from the receptionist at the CDC, who then helped her find relevant experts. This might also explain the experts' patience in evaluating 17 iterations of a zombie virus.

Sawyer agrees, saying that "I love the research aspect most of all; I'd happily do nothing but research, just following my interests and wherever they lead me" (Sawyer 2008b). Perhaps unsurprisingly, not all research makes it onto the page; McDonald says that "Well, 90% of your research you never use, but you have to do it because you never know what that 10% that lifts a book--I think of it like yeast in bread--and makes the reader think, yes, this is real, he's seen/experienced this" (McDonald 2006), and Willis likens research to "an iceberg, with only a small portion showing above the surface and the rest underwater, because if you only research what goes in the book: 1) you don't know enough to have a feel for the subject, and 2) you'll never find those telling details that make all the difference to a story" (Willis 2013). Yet the valorization of research for curiosity's sake also recreates a vision of the search for knowledge, whether scientific or otherwise, is valuable in and of itself and separated from political or social concerns; both a common trope in representations of science in popular culture, fictional and otherwise (Allen 2009; Nelkin 1995; Lessl 1999), and yet another reinscription of the technical/social binary, with all of knowledge now categorized as technical.

The two authors who make up James S.A. Corey, however, did not do research after deciding on specific speculations. As Daniel Abraham said, "We didn't really research for the books so much as take the things we already grooved on and had learned about and mined them for the story" (Corey 2022). Bacigalupi sees this innate curiosity as a necessary quality for a writer, saying that he feels "like my job is to take in tons and tons of pieces and then let them rattle around in my head, so that when I'm sitting down to write, I have details and ideas at hand" (Bacigalupi 2010). Doctorow, who is admittedly a very well-respected tech activist and writer, described his process writing *Little Brother* as being "intimately tied in with blogging. There are pieces to various puzzles lying around on the Internet and elsewhere. You find them as you

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wander through time and space, you pick them up and put them on the table by blogging them.

[...] So readers send me things that seem like part of the puzzle, and then I find the coherent

synthetic picture and put it together" (Doctorow 2009: 60).

Most of these quotes have embedded in them the view that the text, by virtue of being

fiction, nevertheless is more than the sum of its research. Willis's quote shows the importance of

balancing providing evidence of the author *having done* research with the attention and

entertainment of the reader. McDonald's framing instrumentalizes research as accomplishing a

deeper level of empiricism for the author in gaining the reader's trust to "lift" the book as a

whole, and Doctorow points to fiction as providing "the coherent synthetic picture." The primacy

of the entertainment function of the text recalls the section "Register, Form, and Didacticism" in

the previous chapter.

On the other hand, as George R.R. Martin points out, differentiating a work from science

fiction can be a get-out-of-plausibility free card. When confronted with science fictional theories

about the cosmology of Westeros, he dismisses them: "It's fantasy, man, it's magic" (Martin

2011). Yet the genre does not provide an excuse to sidestep all forms of accuracy, in Martin's

mind. When asked in an interview about the use of sexual violence in *A Song of Ice and Fire*, he

answered:

> I'm writing a war story, essentially--the Wars of the Roses. The Hundred Years' War.
>
> They have "war" right in the title of each of my inspirations here. And when I read
>
> history books, rape is a part of all of these wars. There's never been a war where it wasn't,
>
> and that includes wars that are going on today. It just seems to me that there's something
>
> fundamentally dishonest if you write a war story and you leave that out. (Martin 2017)

This quote suggests that there are some genres, or at least types of stories, that Martin *does* think require certain kinds of accuracy--in this case, since *A Song of Ice and Fire* is fantasy, it does not need science fiction levels of cosmological accuracy, but because it is a war story, it does need accuracy in its depiction of sexual violence. As the section "Gender, Genre, and the Technical/Social Binary" in the previous chapter shows, however, this selective accuracy is not socially neutral. Martin constructs an idea of a "war story" where sexual violence requires realism but dragons do not, similar to how reviewers constructed an idea of science fiction where physics required realism but the presence of women did not.

Genre can also signal the depth of plausibility a reader can expect within the umbrella genre of science fiction. Abraham and Franck, interviewed together, express how they negotiated plausibility and genre. Though the quote is extensive, as it takes the form of a dialogue, I will analyze it one speaker's statement at a time.

> **DA:** "The thing that has been interesting for me is people who are reading [*Leviathan Wakes*] as hard science fiction, when really what I think what we were shooting for was plausibility, in the Wikipedia sense of plausibility: 'OK, that makes sense.'

Here Abraham draws a distinction between "hard science fiction" and "plausibility," which he implies to be a lower bar. Hard science fiction, in contrast to "the Wikipedia sense of plausibility," needs to go beyond just making sense; it needs to provide an *explanation*.

> **TF:** I actually know how the Epstein Drive [which allows travel at a significant percentage of the speed of light, enabling the colonization of the solar system in *Leviathan Wakes*] works, the theory behind it, and we will never say what it is because at some point, it will turn out to be wrong.

Franck agrees, and further explains that they have no intention of providing such an explanation "because at some point, it will turn out to be wrong." While this contrasts with some attitudes regarding the need for realism in science fiction (or the lack thereof) discussed in the "Genre Definitions" section of this chapter, this provides additional context to what "the Wikipedia sense of plausibility" is: being concretely incorrect is more wrong and less plausible than being unspecific. In "the Wikipedia sense of plausibility," then, the speculation is given the benefit of the doubt in a way that it perhaps is not in hard science fiction, where the expectation is that an affirmative explanation will be provided.

> **DA:** There's no reason to explain. And that's the other thing about this project. Our theory on writing this type of science fiction--it's like, in the real world, if somebody says, 'Hey, you bought a new car,' and I say, 'Yeah, it's a hybrid' and you go, 'Cool,' do you have any idea how a hybrid car works? So if you live in some fictional future and you say, 'I've got an Epstein Drive in this,' the person goes, 'Yeah, cool, I hear those are good.'"

Abraham here argues that in some cases, a *lack* of explanation is more realistic and plausible than providing one. In "the real world," everyday technologies are neither so deeply known nor so deeply *explained* as would be required to provide an affirmative explanation in "some fictional future."

> **TF:** We wanted that feel of, 'Sounds like a real thing, like it could be plausible. But...' People now don't sit and lecture each other on how the internal combustion engine works. Most people have no *idea* how it works. Some writers can do that kind of explanation well, but a lot of time when you're reading a book like that, one of two things happens. Either there's an infodump where it's clear the writer of the book (not the narrator) is explaining to you how things work (and that throws me out of the story) or two characters

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talk to each other about it. If it's not done really well, my first thought is, 'Why are these people talking about this?' Nobody walks into the room and says, 'Hey, Dan, can you turn on the light? *As you know*, when you flip the light switch on, the contacts will allow electricity to flow to an incandescent coil inside a vacuum inside a glass tube.' 'Yes, I *do* know that. I'm turning the light on now.' (Corey 2013: 48)(LOCUS, 48)

Franck expands on Abraham's discussion, locating the break in plausibility in places "where it's clear the writer of the book (not the narrator) is explaining to you how things work." These "infodumps" break suspension of disbelief by revealing the artificial nature of narrative-- rendering the labor of the author visible. Franck and Abraham are not the only authors to point out the shell game that science fiction--and fiction more generally--plays in hiding its own construction; Martin pointed out that "Fiction has more structure than life does. But we have to *hide* the structure. We have to hide the writer, I think, and make a story seem like it was true"(Martin 2014, emphasis in original). The notion of what must be hidden as a necessary part of the form calls to mind, of course, the way that the empiricist repertoire hides the individuality and contingency of the scientists conducting research (Gilbert and Mulkay 1984).

Similar tradeoffs of plausibility, although in the case of speculation itself and not its presentation, appear in an interview with Bujold where she freely admits of her Vorkosigan Saga that "the gaudy space opera backdrop is bogus unobtanium, in terms of real world physics, not to mention economics--the biology's pretty solid, though, that's the actual SF part" (Bujold 2010b). Stross, too, frames a certain amount of leeway into otherwise rigorous extrapolation, referring to his humanlike robots in *Saturn's Children* as the "one really difficult technological magic wand" and describing his decision to "take this one science-fictional concept, drop it into a space opera, and try to bolt it down as tightly as possible" (Stross 2008: 70). These two quotes next to each

other illustrate the tension in the label "science fiction": Bujold identifies the "pretty solid" biology as "the actual SF part," placing the true basis of the speculation as the cornerstone of "SF," while Stross takes the concept that he considers to be *implausible* as the "science-fictional" element. For Bujold, what makes "science fiction" is the *science* within the *fiction*; Stross instead frames "science fiction" as the *fiction* within the *science*. The difference between whether it is the realism or the *departure* from realism that defines science fiction has potential implications on what the relationship between science and science fiction ought to be, and the fact that there is not consensus even between only two highly lauded science fiction authors suggest that there is no single normative relationship there. The normative application of a single version of that relationship, then, rings even more hollow than before.

On the other hand, Miéville dismisses the idea that scientific rigor is a necessary quality of science fiction at all:

I mean, let me be clear, some science fiction is predicated on a relatively rigorous extrapolation from scientific fact, but an awful lot of it isn't. And the moment one starts trying to police that border, you get an incredible amount of special pleading and bad faith and exceptionality, and "yeah, but, you know what I mean" and all that kind of thing. So I think it's much more to do with a certain kind of attitude, a kind of scientific pose. There's a certain show of rigor, but the show is in many cases completely specious, and we can think of many examples of classic works of science fiction in which the supposedly rigorous extrapolation is completely bogus. And I should add that this is not in any way a criticism. There's nothing wrong with any of this, it makes for some wonderful books, but I do think the idea that science fiction is based on a kind of rigorous

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cognitive extrapolation and fantasy is just silly dreaming is completely untrue. (Miéville
2011)

Here, Miéville outright rejects some recurring assumptions around the (admittedly
contested) relationship between scientific rigor and science fiction. He points out the inclusion of
works with "completely bogus" extrapolation in the "classic works" and notes that the
negotiation of the boundary between science fiction and other genres (later fantasy) is
inconsistent at best, with "special pleading and bad faith and exceptionality." (Lightspeed)
Science fiction, Miéville argues, has *never* required rigor.

In another interview, he expands on how little rigor and realism matter to *him* as a reader,
not just the genre:

[W]hen it comes to nuts and bolts, physical stuff, I don't really care about hand-wavium.
This is something we deal with a lot in the fantastic. I don't really care that HG Wells gets
his sphere to the moon with gravity-repellent paint, I don't give a shit. Some readers
really do give a shit--like Jules Vernes did--and it spoils it to them. To me it just doesn't. I
don't care: I'm much more likely to be infuriated by a psychological implausibility.
(Miéville 2012)

He later refers to "a particular kind of geek mentality: this desperate desire to dot all i's
and cross all t's," invoking rigor once again and identifying the *refusal* to provide that rigor as,
occasionally, a source of pleasure while reading (Miéville 2012).

This notion that *some* aspects of speculation are subject to the norm of realism while
others are not shows the malleability of the norm in science fiction. This malleability has not
gone unnoticed. Many authors acknowledge that the standard of realism has been inconsistently

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applied across the subgenres of SF. As Jemisin notes of the traditional epic fantasy setting inspired by medieval Europe,

> Do some damned research. The Medicis had black family members! The Moors were part of European life for centuries. Medieval Europe was full of strong women and Jewish merchants and Chinese traders, gay knights and married popes and peasants who did important things besides becoming kings, or restoring deposed kings to thrones. There's no reason for medieval Europe-based fantasies to be as boring as they are. (Jemisin 2010a: 66)

Jemisin here takes aim at the idea that an accurate depiction of medieval Europe, even if one is aiming for such accuracy in a created setting, would not conform to the traditional and taken-for-granted medievalist ideologies of race (see chapter 1, "Founding Fantasy," of Young (2015b) for a deeper discussion of the founding of epic fantasy and how 1900s views of race and racialization were built into, e.g., Tolkien's Middle Earth). While fantasy as a genre might accept white heteronormative defaults, Jemisin argues, this is a view of history that is in and of itself biased; yet this bias is accepted without breaking the suspension of disbelief for most readers because it has become inscribed into the genre. Realism in diversity and representation, in fantasy, *is not a norm that has been traditionally enforced*.[68]

Perhaps it is too simple to point back at the technical/social binary as an explanation, as diversity and representation would traditionally fall on the "social" side. Yet in this chapter and

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[68] This is not unique to science fiction literature; Sawyer notes that "as a kid, the interracial crew on *Star Trek* seemed correct to me, whereas I was astonished that there was no one who wasn't white in [Kubrick's] *2001*, which came out at the same time, or in the first *Star Wars* movie, which came out a decade later." (Tor.com)

the previous, I have shown how critiques disproportionately accumulate on the social side of the binary, particularly for women and people of color. Realism is only demanded of (white, masculine) science; empiricism is desirable but, for certain writers, unattainable; rigor is necessary only in scientific extrapolation and not for social representation; and, of course, objectivity is normalized to be freedom from a very specific kind of bias.

Conclusion

As I have worked on this project, I have struggled with the sense that the conclusions I draw are smaller than the phenomenon I want to identify. This is, of course, by design: in standardizing my archive I necessarily excluded contemporary goings-on and ongoing disputes. Looking at a few specific plants might give you an idea of how photosynthesis works, but it won't do a very good job of, say, describing the impact of deforestation on climate change.

And there is quite a forest that I ignored for these particular trees. Seanan McGuire commented on Twitter in 2015 that she gets pushback on the legitimacy of her speculations "5xs more...than any male author I know in the same field." (seananmcguire 2015) At a convention in 2018, hard science fiction author Gregory Benford said of N.K. Jemisin's work, "If you write sf honey, [you] gotta get the science right," (Glyer 2018) at nearly the same time that author Robert Silverberg decried Jemisin's "angry acceptance speech" for her most recent Hugo as "graceless" and "politiciz[ing] what should be a happy ceremony." (Silverberg 2018) Author Silvia Moreno-Garcia pointed out some of the genre hypocrisy embedded in Benford's statement, saying "Sci Fi is littered with implausible Science (Phillip K Dick, Heinlein) which didn't stop books from being lauded. But you get a woman, a black woman, writing SF and suddenly oh 'honey' it better be hard sci Fi." (silviamg 2018) That same year, and shortly after Benford's comment gained publicity, Scalzi noted that his science "is frankly atrocious, and yet no one ever once criticized it or me for that." (scalzi 2018)

In 2019, author Veronica Schanoes criticized a blog post by author Norman Spinrad that decried the rise of fantasy over science fiction, noting that "It's hard NOT to read that in gendered terms: the soft girly magical stuff is doing better than hard SF." (schanoes 2019) 2020

saw Alexandra Erin commenting on the lack of resistance for white men calling their work science fiction compared to other authors, even "if the essential speculative leap is a complete black box, unexplained and inexplicable." (AlexandraErin 2020)

Cherie Priest has been vocal about how she interprets reminders about the inaccuracies in her Clockwork Century series, starting with *Boneshaker*--despite having acknowledged and minimized these inaccuracies in her author's note at the end of the text. As she said in 2018, steampunk is "prone to abuses of power/oppression reinforcement in the name of historical accuracy. It has always been strongest when it challenges colonialist/capitalist narratives." (cmpriest 2018)

And all this is, of course, *after* the Puppies debacle, which Wallace called "The Battle for Pop Culture's Soul."

So, as both an academic and a fan, what can I take from this project?

First, as Chapter Five suggests, many of the gendered and raced differences in norms are seen (and borne) primarily by women and people of color. This is in line with what has been seen in STEM (see Chapter One), and it may account for why certain people might not realize that their comments or actions were offensive. For example, Benford objected to being characterized as sexist or racist for his critique of Jemisin, noting that he simply preferred "hard sf," and Silverberg said that his comment was on the tenor of the Hugo Awards ceremony and not Jemisin's race or gender.

But I argue that these comments cannot be taken out of a larger context where norms are consistently used against certain *types* of people, rather than genres or award ceremonies. Benford's comment--to say nothing of his use of "honey"--cannot be looked at in isolation, but must be framed in a genre where the legitimacy of speculations by women and people of color

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are devalued simply because the authors *are women and people of color*. Benford's statement did not just imply that *he* was a better authority on hard science fiction than Jemisin would be, but also that he knew the requirements of the genre--and, indeed, *the text she wrote*--better than she did. In a genre where women and people of color are repeatedly told that they cannot be trusted with even the things they made up, Benford implied exactly that.

The solution, to me, seems deceptively simple: critics should think about the larger context of their critiques before making them. Those who finish *Boneshaker* and want to object to the historical inaccuracies should ask themselves what difference the inaccuracies make in a story about zombies. And when someone tells them that their critique is neither warranted nor appropriate, they should listen. The context that is salient for one member of the community may be utterly invisible to another, and there simply is not a single god's-eye view from nowhere that will reveal to every fan what every other fan should or should not take into account.

Nisi Shawl and Cynthia Ward invoke the astronomical concept of parallax, in which the background of an observation shifts depending on the location of the observer. In their guide *Writing the Other: A Practical Approach*, they emphasize acknowledging differences in perspectives as key for authors writing characters who are minoritized (Shawl and Ward 2005). While they apply the metaphor of parallax to characterization (different characters, depending on their perspectives, will see things differently), I find it equally applicable here. Indeed, Shawl and Ward have a section discussing unintended resonances and associations; the unintended resonances and associations of technoscience, as I have shown in this project, are deeply implicated in gendered and racialized boundary-work. Asking critics to consider context asks critics to engage in the type of epistemic humility that is traditionally trained out of technoscientists.

These resonances point to lessons that can be applied outside the SF community. I find it concerning, to say the least, that the SF community applies scientific norms in a context where the only reason to do so is to invoke the cultural capital of technoscience. It raises the distinct possibility that these norms are seen as inherent to science even by those who are not formally trained in STEM, which does not bode well for attempts to diminish inequities through formal training. Speculative fiction is only one of many arenas in which what counts as science and knowledge is disputed, but it offers a unique opportunity to take the temperature, so to speak, of a scientifically-interested community.

Work on this kind of technoscientific climate, I argue, hasn't really been done in STS for some time. As mentioned in Chapter One, work on the "chilly climate" in technoscience happens in education research or quantitative analysis (such as NSF's Science and Engineering Indicators tracking the proportion of women and racial minorities in STEM). There is a gap in attention where STS has ceded the ground of how the nebulous, fuzzy concept of "science" operates in low-stakes environments. Science does not only exist in laboratories, classrooms, or technologies; as I have shown, the concept of it exerts gendered and racialized power even when it is only obliquely invoked.

My point in this dissertation is not that scientific values inflect exposition, or impact book reviews, or inform how authors think about their work. My point is that scientific values *do all of those things*. They are consistent and pervasive, and they both pre- and postdate significant cultural upheavals in SF regarding marginalization. The Puppies did not invent the instrumentalization of the technical/social binary for political purposes, nor did they end the use of it. Indeed, one of the significant difficulties I faced in writing this conclusion was to stop adding contemporaneous examples. WorldCon may have changed its voting rules so that slate

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voting can no longer usurp the ballot, but the Puppies are a symptom of a phenomenon that is much wider than even just SF--as Dunbar-Hester showed in the Geek Group, as Olson and Lebuski showed in focus groups discussing drones, and as Eglash identified in the cultural figure of the nerd.

In terms of future work, I would be delighted to see more scholarly engagements with style in SF. While there has been wonderful work done on SF narratives and depictions of specific technologies, surprisingly little academic work focuses on prose, which is arguably the bread-and-butter of, well, prose novels. The kind of analysis I have done here could be done to short fiction, particularly since the shorter publishing lead-times mean that short fiction tends to change more rapidly than novel-length works. The perception of historical SF (as I described in Chapter Two) is also worth interrogating through this lens; the holding up of Godwin's "The Cold Equations" as the epitome of hard science fiction compared to the very unjournalistic prose style suggests to me that, even at the prose level, the historiography of SF could use some correction.

There are also plenty of features of Goodreads reviews that I simply was not able to include in this dissertation that are worth consideration. My analysis was conducted without regard to the rating associated with the review, and certainly one way to gauge the uneven applications of norms would be to see if there are differences in the language used in negative reviews of books by women and men. My sample of novels, in addition, has severely limited when it came to race, with only one author of color; while I am grateful to N.K. Jemisin for her outspokenness and willingness to call out inequitable practices (and, selfishly, this dissertation would be much poorer without it), a more diverse sample would surely help bring nuance to the discussion.

Lastly, a recurring feature in the author interviews that could use more exploration is the way authors discussed the process of *producing* their works. Contractual obligations, editorial preferences, and market realities featured, if not prominently, then consistently. Since the fluid boundaries of social roles in SF are by no means restricted to authors and readers, a deeper consideration of editors, publicists, and so on would provide considerable insight into the workings of the genre.

Ultimately, this project has been a years-long effort to identify a dynamic that made me, both as a fan and a scholar, a bit queasy about SF: a pervasive subtext that, also as someone who studied and then left STEM, I recognized. My studies on race and gender in science reinforced what I was seeing, and I hope that this project illustrates a distinct discursive thread of gendered and raced treatment. It is not everywhere, but it's frankly in too many places.

Even the hardest science fiction is not science, and it is absurd to act as though it is; it is even more absurd to apply the strictest interpretive norms of science to speculative fiction more largely, and when those norms are applied more strictly to women and people of color it becomes difficult to consider those norms to be applied in good-faith. Even good-faith criticisms bear the weight of a long, long, *long* history of bad-faith criticisms, particularly in such a highly involved social setting as the SF community, and when scientific norms are invoked so is science's (even longer) history of bad-faith boundary-work.

I came to STS struggling to understand my own experiences with this bad-faith boundary-work. Even when I was lucky enough to have avoided experiencing it firsthand, it seemed to be in the air and as difficult to grasp as smoke. I have articulated it here not as a power-play to try to make white men, or hard science fiction fans, or really *anyone* feel bad about their writing or their preferences or their criticism. But, as Traweek has pointed out, the

"culture of no culture" of science is spurious, and it no more exists in SF than it does in science. The "no culture" has been carefully attuned to a specific experience, and merely existing in a space of "no culture" while experiencing otherwise feels like existing as a discordant note in a harmony. That does not mean that those for whom the "no culture" comes as naturally as breathing do not breathe; only that some of us are suffocating.

When every photon must be accounted for in a work of science fiction but not a single female character need be present, the nonexistence and irrelevance of women is constructed. When faster-than-light travel is barred and so are the experiences of Black characters, living a racialized life is constructed as equally nonsensical as breaking the fundamental laws of physics. The cultural power of technoscience is the bedrock on which this construction is built.

I have not even touched on issues of disability, neurodivergence, gender outside of the binary, or non-heteronormative relationships in this dissertation, but I hope that I have shown how those of us who exist in marked social categories, from where we are situated, cannot help but notice when we are discussed as more fictional than dragons. Speculative fiction is predicated on the notion that the world could be otherwise, and we notice when it is implied that *we* are the limits of just how otherwise the world could be.

It is hard not to read SF sometimes with a certain baseline of suspicion; to open a book and wonder if you might be able to exist in it, or if it will be another world without you. It's, frankly, exhausting. Working on this project was exhausting. Documenting every subtle or not-so-subtle reminder of yet another hostile space was exhausting, whether it was the space of SF or of technoscience. Yet it was also, in some ways, liberating: it allowed me to plant my feet, claim my location, and document in detail what I had previously only seen in glances. It exists. It is here. And we can make it go away.

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The battle for science fiction's soul did not begin with the Puppies, nor did it end there. The communities of science and SF are precisely--and only--what we, the community members, make it. So long as science and SF continue to rely on inequitable norms to legitimate itself, they will make themselves hostile to anyone not already embedded in scientific legitimacy, and both SF and science fiction will deny themselves the futures they claim to want. If science as it is treated now is the only way to speak truth to science fiction, then the future is looking very white and male indeed.

But that's the whole point of speculative fiction, isn't it? It can be otherwise.

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