

# Astrosociology and Science Fiction: a Synergy

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**Abstract.** Both astrosociology and science fiction have claimed outer space as their preferred turf. Astrosociology did so in order to study the impact of space on human societies, and to develop a set of protocols that earthbound governments can utilize to prepare us for the next phase of humanity's adventure outside our home planet. Science fiction, on the other hand, found in outer space a fitting environment for dramatizing in a work of fiction the potential outcomes attending the kind of decision astrosociology is trying to foster in actuality. This paper explores the relationship between the two fields, and examines ways in which science fiction can contribute to the creation of an astrosociological consciousness. Particular attention will be given to the most relevant commonality that the two fields share: both astrosociology and science fiction are earthbound disciplines, areas of inquiry created by those who never left earth for those who never left earth. They can potentially function as partners in the endeavor of educating the bulk of humanity on the subject of space flight and space colonization.

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## INTRODUCTION

My purpose in this paper is twofold: on the one hand, I will attempt to give a functional working definition of both astrosociology (AS) and science fiction (SF), with a view to identifying their respective areas of competence. On the other hand, I will try to develop a series of protocols through whose agency science fiction can either become an astrosociological discipline or open itself up to an astrosociological perspective.

To my knowledge, this is the first time such a definitional endeavor has been carried out, so that this paper must perforce begin its work by posing some very basic questions concerning the potential relationship between the two fields. For instance, can science fiction be described as an astrosociological discipline? And if so, what role would it play within the larger field of AS? Are the aims of SF and those of astrosociology in accordance or at odds with one another, and depending on the answer, can they be made to function together in some fashion? Answering these questions will also provide us, so I hope, with the tools to develop those operational protocols that will establish an entry point for SF into the field of astrosociological studies.

## ASTROSOCIOLOGY: DEFINITION AND SCOPE

In a 2007 essay, Pass, founder of the astrosociology website and Chief Executive Officer of the Astrosociology Research Institute (ARI), describes the field thus:

*Astrosociology*. . . is defined as the study of *astrosocial phenomena* (i.e., social and cultural patterns related to outer space). It is simultaneously a sociological subfield and a multidisciplinary social science field. As a sociological subfield, it includes in its purview all areas of research and theory that ties human behavior at all levels of social analysis from the micro level (involving social interaction among two or just a few people) to the macro level (involving large-scale patterns, such as human migration into space, and society as a major form of social structure).

As a proper multidisciplinary field, astrosociology includes each of the social and behavioral sciences, the humanities, and the arts. The concentration on space binds these diverse disciplines together to fill a neglected niche that complements the space community's traditional concentration on the natural sciences. It finally places an emphasis on the numerous complications associated with the long-neglected *human dimension*. (Pass, 2007)

Insofar as they determine whether a discipline falls within the envelope of an astrosociological study, the "astrosocial phenomena" Pass describes in the definition quoted above represent a fundamental factor in précising the role of a humanities-related field within astrosociology. In his 2004 inaugural essay, Pass makes a distinction between astrosocial and non-astrosocial phenomena, and identifies their relationship within the realm of sociological phenomena at large. Astrosocial phenomena differ from their non-astrosocial counterparts in that they "[pertain] to all social conditions, social forces, organized activities, objectives and goals, and social behaviors directly or indirectly related to 1) spaceflight and exploration or 2) any of the space sciences (*e.g.*, astronomy, cosmology, astrobiology, astrophysics)" (Pass, 2004). The distinction between social forces and the scientific and technological realities to which they apply is crucial here. As Pass himself openly states, astrosociology is not an equivalent discipline to astronomy, cosmology, or any other such field – in fact, it is not particularly concerned with discoveries in those fields in and of themselves. Those breakthroughs properly belong to their parent discipline. Rather, AS "is concerned about how such discoveries and innovations affect various elements of a particular society." Thus, the accomplishment of advances or discoveries in one or more fields related to space combines with their impact upon a specific subset of a society's population to create an astrosocial event, and that subset of the population will, in all likelihood, become an astrosocial phenomenon. Moreover, the barrier separating astrosocial from non-astrosocial phenomena is far from rigid:

The relationship between the two sectors is both dynamic and ever-changing. Cooperative efforts between government agencies (*e.g.*, NASA) and private companies (*e.g.*, Boeing), or educational organizations, are commonplace in contract work and research efforts. Connections also involve the funding of efforts that benefit astrosocial and non-astrosocial sectors. (Pass, 2004)

To give an example of what astrosocial and non-astrosocial phenomena are, and of how they might interact, we can consider the case of a large publisher dedicating part of their catalog to space-related books – a coffee table edition of the Hubble Space Telescope's best images, say, or an atlas of the universe. Taken as a whole economic and bureaucratic entity, such a publisher – Ballantine or Simon and Schuster, for example – would represent a non-astrosocial phenomenon. Their catalogue would be filled with all sorts of publications, from cookbooks and romance novels to history and humor, and only a small part of it would be dedicated to works of any relevance to space-related matters. This small part of the catalogue, however, would have the potential to 1) become an astrosocial phenomenon in its own right, or 2) produce what we might call astrosocial triggers – books or other artifacts (*e.g.* DVDs, posters, paintings, pictures) popularizing the matter of space in such a way that, once disseminated among the public, could foster the creation of astrosocial phenomena. In the first case, the subset of this catalog dedicated to space could become an astrosocial phenomenon in and of itself if, as is actually the case for many publishers, its parent entity were to thematize its subject matter by putting it under a context-specific imprint, with a name and a logo of its own. In such a case, the books grouped under this new heading would become more than a simple concoction of titles that happen to be discussing the same general topic. There would be a self-awareness explicitly informing their grouping, an overarching intention to identify the subject matter as a reality to be isolated and specified for the benefit of the reading public. Thus, this imprint would itself become the focus of a certain level of cultural agency in matters of space, a cultural agency kept alive by socio-economic exchanges across the divide between publisher and public, seller and buyer. In short, it would become an astrosocial phenomenon.

It may be the case, however, that the publisher would grant no such official recognition to the matter of space. Books dealing with it in one way or another would just be in the catalogue for the same reason other kinds of books are present: they sell. Even in this case, though, the potential for the development or maintenance of astrosocial phenomena remains very high. Any commercial artifact dealing with space (a book, a movie, a documentary, the plastic scale model of *Apollo 11*) can be described as an astrosocial trigger – a catalyst of public and personal interest that, although not an astrosocial phenomenon per se, fosters the creation of a community of like-minded individuals united by a common, more-than-casual interest: broadly speaking, to read and know more about space in all its aspects, from the gathering of information and images to the replication of the artifacts of the space age. To the extent that it would represent a subset of a society interested in and affected by the reality of space, such a community would indeed become an astrosocial phenomenon. For example, a coffee table-sized book collecting pictures from the Hubble Space Telescope, perhaps published by an otherwise mainstream label, cannot by itself

constitute an astrosocial phenomenon. Its creation, production, and eventual sale in bookstores would simply be a function of the publisher's desire to diversify and attract more customers. If the book were to sell, it would stay in print. Otherwise, the publisher would replace it with another kind of book – cooking, maybe, or horse-riding. However, those who are deeply interested in space, while not necessarily constituting a large enough section of the reading public to keep the book in print, would nevertheless be likely to buy it for its subject matter and, utterly independently of the intentions of those who had originally manufactured it, show it to other fellow enthusiasts. As is often the case with social gatherings, the simple viewing of the book may start a discussion or a dialogue about space and what it means for mankind, and this dialogue may in turn result in a commitment to the matter – a club, possibly, or a letter to a congressman from an officially recognized association of interested citizens who desire that greater resources be allotted to space science and exploration.

Of course, astrosocial phenomena of both kinds already exist. More than one publisher has created space-related subsets in its catalog (Firefly and Springer, for example), and many commercial products (e.g., atlases of the universe, skywatchers' guides, virtual planetariums) have acted in concert to unite people in such organizations as astronomy clubs, sky watching clubs, and the like. In fact, these realities are widespread enough that there are publishers exclusively dedicated to the production of space-related books (for instance, Willmann-Bell Inc.) and other manufacturers exclusively dedicated to, say, commercializing plastic models of famous spacecraft, both imaginary and real. In this case, we may have good reasons to consider such producers as astrosocial phenomena in their own right.

If astrosociology is the discipline that studies both the nature of astrosocial phenomena and their interaction with non-astrosocial phenomena, then it must necessarily follow that science fiction, itself a literary phenomenon possessed of a distinct socio-economic identity, can – and should – enter into a relationship with astrosociology, either as an astrosocial or as a non-astrosocial factor. This idea finds support on the main page of the Astrosociology Research Institute's website, where the section entitled "What Is Astrosociology?" states that, although AS was originally born as an almost exclusively sociological discipline, "Almost immediately. . . . it became clear that contributions were required from the other social and behavioral sciences, the humanities, and the arts (hereafter referred to as the 'social sciences' for brevity)." As a subset of the humanities and the arts, science fiction is clearly in a position to provide a relevant contribution of some sort. What kind of contribution, however? Do we have any criteria that can help here?

The only existing clue from the side of astrosociology itself resides at the beginning of Pass (2007), which [in a diagram on page 8] constitutes a graphic representation of the "Macro-Level Interactive Effects between Astrosocial and Non-Astrosocial Sectors," where the area of interaction is expressed as a common territory within which the two sectors, each one originating within its field of competence, interact and merge. Science fiction lies in the non-astrosocial side of the diagram. Since the paper provides no explanation for the choice, we can only speculate as to its motivation, especially because, at first sight, it seems counterintuitive. Space travel and the creation of spacefaring societies are staples – if not *the* staples – of science fiction narratives, and outer space can arguably be described as these narratives' preferred stomping ground. Why the choice to include it among the non-astrosocial phenomena? Would it not be better to at least award it the status of astrosocial trigger? In fact, as I hope to demonstrate in the pages that follow, Pass' choice is far from flawed or wrong – it is simply incomplete. To explain why, we must now turn toward an understanding of the nature of science fiction, and of the niche it occupies within the larger field of general literature.

## SCIENCE FICTION: DEFINITION AND SCOPE

At the most practical of levels, we – the reading public – all know what science fiction is. It is one of the two genres placed in the "science fiction and fantasy" section of the bookstore, and we can easily distinguish a SF book from a fantasy book by looking at their covers: the cover of a fantasy book will feature castles, dragons, wizards, or various characters sporting clothing and apparel belonging to a quasi-medieval or quasi-Renaissance environment; a typical example of this genre is arguably Tolkien (1968). The cover of a science fiction book, on the other hand, will feature robots, starships, cityscapes of the future, and other artifacts belonging to a level of technological advancement far beyond ours. More often than not, such visions of future life will appear against a starry background, or maybe backlit by the glow of a planetary nebula or a stellar nursery; the typical example of this genre is, again arguably, Asimov (1963).

However, while this kind of practical examination will give the general public a useful set of visual cues to help them select the book they should buy when they want to read science fiction, it still does not tell us what the genre is or what it does. After all, detective fiction features plenty of handguns and private eyes, but it is not primarily *about* them; rather, it uses them as props to tell a story about, say, betrayal and faith, or jealousy and love. By the same token, science fiction is not really about starships, scientists, or life in a future megalopolis. These features, important as they are for the plot of the narrative, once again represent the props through whose employment a SF story will make its point – that an advanced society should not wage war, perhaps, or that human nature is perfectible, or again that morals and ethics are subject to change across the years and the parsecs. And indeed, of the dozen or so definitions that Clute and Nicholls (1993) discuss, not one of them mentions starships, warp drives, futuristic machines, outer space, or any other specific prop of the genre. Instead, they all try to point toward a definition of SF based on what it tries to do with those props, or on its literary ancestry, or even on its publishing practices.

Two of the most direct, and at the same time most frustratingly vague, definitions of science fiction belong to that last parameter: Damon Knight's statement that "Science fiction is what we point to when we say it," and Norman Spinrad's opinion that "Science fiction is anything published as science fiction" (qtd. in Clute & Nicholls, 1993). While these definitions have the same advantages of practicality and observance of commercial realities that inform the choices made by an average reader at the bookstore, they also share their inability to go beyond establishing that we may not understand what SF is, but we'll recognize it when we see it. We still do not have a sense of the genre's identity or function. A more inclusive working definition is provided by Aldiss and Wingrove (2001), which involves a critical history of science fiction. In it, they define SF in the following terms:

*Science fiction is a search for a definition of mankind and his status in the universe which will stand in our advanced but confused state of knowledge (science), and is characteristically cast in the Gothic or post-Gothic mode. (Aldiss & Wingrove, 2001)*

Aldiss and Wingrove's argument places science fiction squarely within the realm of literary endeavor. First of all, it represents SF as the literature of scientific transcendence, the dramatization of humanity's search for meaning within a scientific and technological frame of reality. Secondly, it hints at the genre's literary and rhetorical ancestry with its reference to the Gothic, a mode of fiction writing that became popular in Britain during the mid-18<sup>th</sup> century and prospered in its original form all the way up to the early 1800s, when Shelley (2000) wrote at once the crowning achievement of the transitional period between the early Gothic tradition and the later Gothic/post-Gothic modes and the novel that Aldiss considers the first true science fiction narrative. To this day, this definition of SF remains one of the most useful critical tools available to us, because the boundaries it establishes are inclusive enough to allow the vast majority of narratives published under the heading of SF entrance within the genre, but also exclusive enough that they can keep out works of fantastic literature that even a casual reader would recognize as other than science fiction. However, Aldiss and Wingrove make no mention of spaceflight, space habitats, or anything connected to astrosocial phenomena, and indeed their definition does not require them. Shelley (2000), the text they indicate as the common ancestor of science fiction as we know it today, has nothing to do with spaceflight, but it perfectly conforms to the criteria they establish as fundamental to identifying a given literary work as SF. Other seminal works in the genre – Verne (1962), or Wells (2001 and 2001) – share the same close adherence to the definition while being devoid of astrosocial perspectives.

On the other hand, both Aldiss and Wingrove have written several works of "Gothic and post-Gothic" science fiction, and many of them – e.g. Aldiss (1958 and 1960) and Wingrove (1989) – are about space, its colonization on the part of the human race, and the implications of this endeavor for mankind's sense of its place in the grand scheme of things. Very many works of spacefaring SF, from Heinlein (1949) to Vinge (1992), are included in Aldiss & Wingrove (2001), and their portrayal of humanity's venture into space would certainly earn them at least the status of astrosocial triggers. In his entry on space flight in Clute & Nicholls (1993), Stableford rightly describes it as "*the classic theme in sf,*" and there is little doubt that the majority of SF works published in English feature space, spacefaring societies, and space travel in one form or another. Therefore, we find ourselves in a definitional quandary: while science fiction does not automatically require the presence of astrosocial phenomena to *be* science fiction, it is also evident that these phenomena inform its subject matter to the point that the reading public's perception of its identity is indivisible from them. So where is the dividing line? What are the criteria?

Of all the definitions of science fiction that appeared over the last hundred years or so, the one that comes closest to providing us with those criteria is Darko Suvin's. In his 1979 book, Suvin drew on the critical tradition of Eastern European formalism to create an identity for the genre that profoundly influenced following generations of SF critics, all the way up to the present time. Suvin identifies the peculiar characteristic isolating a work of science fiction from any other literary work in the "*narrative dominance or hegemony of a fictional 'novum' (novelty, innovation) validated by cognitive logic. . . . a totalizing phenomenon or relationship deviating from the author's and implied reader's norm of reality.*" In the imaginary universe created within a work of SF, the novums are the elements that do not fit the shape and laws of the world outside the narrative – the technological artifacts, scientific discoveries, historical events, or social developments that both the writer and the reader know never occurred in reality. To give a few examples: in Bear (1985), the novum is represented by the discovery of a powerful, self-aware agent of genetic change that by the end of the story has utterly altered life on Earth. In Baxter (1996), it is represented by an alteration in the course of known history: JFK survives the assassination attempt in Dallas, and goes on to shepherd the space program all the way to Mars. In the various *Star Trek* series, a plethora of novums are postulated: the warp drive, the replicator the teleport device, the United Federation of Planets, plenty of alien races, and so on and so forth. Novums set the fantastic apart from mainstream literature and provide the engine of story with its motivating force, the new shape of the world which everybody, from the characters in the narrative to the reader sitting in their couch at home, must conform to and come to terms with.

By itself, however, the presence of one or more novums cannot adequately separate science fiction narratives from other fantastic stories. The ring of power in Tolkien (1968) the sword Excalibur in White (1961), or the magical dimension inside which Hogwarths resides in Rowling (2005) – elements of his kind are novums, to be sure, but their nature is magical and mythical, not rational. They belong to fantasy, horror, or magical realism (depending on the author and the narrative, of course), but they are certainly not science fictional. This is where Suvin's mention that the novum in the story must be "validated by cognitive logic" comes in. As fantastic as a SF writer would like to make the elements in their narrative, these elements must have an at least plausible connection to our present state of scientific, technological, or socio-historical knowledge, and the narrative itself must make the explanation and normalization of these novums one of its key aims. Thus, when Suvin defines science fiction as "*a literary genre whose necessary and sufficient conditions are the presence and interaction of estrangement and cognition, and whose main formal device is an imaginative framework alternative to the author's empirical environment*" (Suvin 1979), he does so in the attempt to place the novums at the centre of an intellectual protocol for the systematic, rational apprehension of the alterations they operate in the structure of SF narratives. This protocol is two-pronged: estrangement, which Suvin describes as the ability to comprehend a recognizable object or phenomenon in a new, unfamiliar light, represents the process by which the novums in a science fiction story imaginatively distance us from our actual physical and socio-historical circumstances. Cognition, the attitude through whose agency "SF sees the norms of any age, including emphatically its own, as unique, changeable, and therefore subject to a *cognitive view*," allows both the characters and the reader to subject the SF narrative to a rational, logical examination of the premises according to which the novums function, thereby normalizing and understanding their impact.

## ASTROSOCIAL AND NON-ASTROSOCIAL SCIENCE FICTION

Suvin's casting of science fiction as a "*literature of cognitive estrangement*" (Suvin, 1979) whose operative principles are triggered and mediated by one or more novums gives us a useful entry point into a possible identification of the genre with astrosociological concerns. On the one hand, it is fairly clear that Pass' decision to list SF among the non-astrosocial phenomena is essentially correct. Despite the inarguably deep identification of science fiction with space-related matters, we must necessarily accept that space is a theme within the genre, not one of its structural characteristics. Suvin himself warns that

SF should not be seen. . . . in terms of science, the future, or any other element of its potentially unlimited thematic field. Rather, it should be defined as a fictional tale determined by the hegemonic literary device of a *locus* and/or *dramatis personae* that 1) are *radically or at least significantly different from the empirical times, places, and characters* of 'mimetic' or 'naturalist' fiction, but 2) are nonetheless – to the extent that SF differs from other 'fantastic' genres, that is, ensembles of fictional tales without empirical validation – simultaneously perceived as *not impossible* within the cognitive (cosmological and anthropological) norms of the author's epoch. (Suvin, 1979)

And so we can say that such widely recognized works of science fiction as Heinlein (1940), Sturgeon (1941), or Miller (1997) are examples of the non-astrosocial side of the genre. The novums they feature in their respective

narratives (nation-wide mechanized walkways in Heinlein; a lone scientist's creation of a society of microscopic beings in Sturgeon; a post-nuclear holocaust society in Miller) are fully compliant with Suvin's parameters, yet do not address space flight or colonization in any way. Therefore, insofar as science fiction readily accepts but does not require astrosocial phenomena or triggers to be what it is, we should indeed place it among the non-astrosocial phenomena in society – susceptible, along with all other similar phenomena, to interaction with their astrosocial counterparts along the buffer zone between the two groups.

On the other hand, however, we can conceivably make the argument that space is something more relevant to science fiction than a single theme or trope. First of all, Suvin inserts the term “cosmological” in the definition quoted above. He does so between parentheses, almost as if the term itself was an afterthought, but I believe that its presence there is telling. If, as Aldiss and Wingrove write, SF is “a search for a definition of mankind and its status in the universe” (and could we not say that their usage of “universe” is an astrosocially relevant choice as well?), then this status must necessarily include mankind's awareness of the size, shape, and nature of this universe as revealed by our science and technology. Moreover, if the novum in a science fiction story must be “validated by cognitive logic,” then this cognitive logic cannot escape what is known. Irrespective of whether or not we choose to avoid looking out toward space, we still know it is there, and we also know, within the boundaries of our knowledge at any given point in time, what its presence means on a grand scale. Suvin himself, in describing the characteristics of estrangement, makes reference to the Galilean method of observation and deduction (Suvin, 1979), and more than one observer (notably Gerrold, 1996; James, 1994; Aldiss and Wingrove, 2001; McCurdy, 1997) has remarked on the mutually advantageous roles that the matter of space and the matter of science fiction played in fostering one another's growth in the public eye. As Gerrold writes, “Space is *not* the final frontier. The final frontier is the human soul. Space is where we will meet the challenge.”

And indeed, science fiction has acknowledged its awareness of Gerrold's challenge since its early days by isolating and précising it into self-consistent thematic units. This practice is not exclusively confined to SF, but rather it is characteristic of every literary genre; detective fiction, for example, does not represent a single monolithic entity, but is rather subdivided into sub-genres (*e.g.* hard-boiled fiction or the police procedural), each sub-genre featuring a localized, context-specific variation on the overarching narrative matter of its parent genre. In the case of science fiction, the field has parceled out its body of work into a number of discrete thematic units, each thematic unit characterized by the pervasive treatment of one or more themes among the range featured in the genre at large. Thus the matter of science fiction – and the many kinds of reading experience that come with it – can be further subdivided into such niches as planetary romance, space opera, hard science fiction, cyberpunk, steampunk, science fantasy, and many others. Some sub-genres are not particularly responsive to an astrosociological treatment – like steampunk, for example. Steampunk is an “item of SF terminology coined in the late 1980s. . . . to describe the modern subgenre whose sf events take place against a 19-century background,” and it represents an essentially American SF movement whose works are “often set in a London, England, which is envisaged as at once deeply alien and intimately familiar, a kind of foreign body encysted in the US subconscious” (Clute & Nicholls, 1993). Therefore, the locus of interest for a narrative belonging to this sub-genre would not be space and its colonization, but rather a specific period in the history of the United States, England, and the industrial revolution, revisited in an oddly anachronistic *mélange* of advanced artifacts – like computers or planes – powered by steam or coal-driven engines. The Victorian age that never was seen from the point of view of its distant children. Some steampunk stories do feature elements of space-related themes, but these are peripheral to the main point and thus provide no more than a default chance for an astrosociological reading.

Other sub-genres, on the other hand, are far more focused on matters of interest to astrosociology. Planetary romance, for instance, constitutes a subset of science fiction whose focus – planetary environments – is as fundamental to its identity as a 19<sup>th</sup>-century setting is to steampunk's. Planetary romance, which Clute describes as “any sf tale whose primary venue (excluding contemporary or near-future versions of Earth) is a planet, and whose plot turns to a significant degree upon the nature of that venue” (Clute & Nicholls, 1993), encompasses those narratives that feature one or more planetary biospheres as – literally – the main characters (or some of the main characters) of their plot. It is not enough for a science fiction story to take place on a planet, or feature planets within its made-up universe; “In the true planetary romance,” Clute writes, “the world itself encompasses – and generally survives – the tale which fitfully illuminates it.” In this characteristic lies the astrosociological relevance of the tale of planetary romance: narratives belonging to this SF strain typically adopt a global, planet-centric perspective on the human (or other-than-human) aspects of the narrative, placing them within an environment that, transcending as it does the lifespans of the species that are born, live out their existences, and later die inside it, provides readers

with a reflection on the interrelations between living beings, their societies and cultures, and the biosphere that nurtures them.

A relevant exemplar for the tale of planetary romance is Aldiss (1996), set on a planet whose eccentric orbit around its parent star engenders eon-long winters of extreme harshness, followed by equally long springs and summers. The human-equivalent species on Helliconia rises from barbarism at the beginning of the spring, flourishes during the summer, and dies in the winter, to begin the cycle all over again when the planet returns to the vicinity of its sun, eons hence. Entire societies rise and fall during the spring-summer interval, and all are vanquished by the inexorable onset of the winter, against which nothing can stand that is not adapted to its conditions. The quasi-human races of Helliconia die, and leave the planet to other species, which will in turn relinquish their domination over its surface at the end of their winter cycle. The unconquerable nature of the seasonal rhythms on Helliconia, coupled with Aldiss' choice to view the human events in the story from a bird's eye view and with his meticulously researched exobiological setup, creates a narrative in which the only entity whose existence feels longer than that of a butterfly is the planet itself. To underscore the point, Aldiss postulates the existence of a space station in orbit around Helliconia, unknown to the planet's natives and undiscovered throughout the narrative. The space station, called Avernus by its crew, is manned by human beings from a vanished Earth (the planet destroyed itself in a global nuclear war), their mission that of studying Helliconia and its life cycles as a whole network, observing and cataloguing across the generations the ebb and flow of seasonal life on the planet. Toward the end of narrative, the descendants of the station's original crew, after centuries of no contact with a now-dead Earth, have fallen into madness and barbarism, and at the same time as the proto-humans on Helliconia start dying with the arrival of the long winter, so do the humans on Avernus set out on the path to extinction. At the end of the narrative, the station is a lifeless hunk of metal. Human (or quasi-human) life on the planet below will, in time, flourish and thrive once again under a new spring, but for Earth humans, there will be no return.

Is planetary romance susceptible to an active astrosociological interpretation? Or more importantly, can it be identified as an astrosocial phenomenon? What about other sub-genres focusing on the matter of space, like space opera or hard science fiction? At the very least, we can classify the works that conform to planetary romance's thematic concerns as astrosocial triggers, insofar as they treat this part of the matter of astrosociology in such a way that readers and scholars alike would find in them plenty of raw materials for the formation of an astrosociological consciousness on such subjects as planetary colonization, global environmental husbanding, biospheric triggers of biological and social developments, etc. But I think that we can go further than that. Every literary genre dedicates a substantial part of its energies to nurturing and developing its self-awareness, and science fiction is no exception. Writers working within its confines learn from those who came before them, creating works that push the boundaries achieved by their predecessors while at the same time acknowledging their literary influence. Writers and critics develop schools of thought that theorize on the identity, achievements, and future direction of science fiction, and in that they are helped to a substantial degree by the historically numerous, active, and vocal networks of fans who read SF magazines and watch SF movies, write and broadcast their opinions on the status of the field, and attend conventions where they meet their favorite writers, editors, and critics. The net result of this constant process of discussion, assessment, and forecast is not simply the training and education of future generations of science fiction writers, but also the creation of a feedback loop uniting producers and consumers of SF in a community of like-minded individuals whose passion for their favorite literary form will a) connect them to other subsets of society that focus on related subjects (astronomy, physics, sociology, cosmology) and b) engage the remaining social groups in a relationship aimed at securing for their field the consideration and respect they feel it deserves. Sub-genres of SF like planetary romance, space opera, and hard science fiction can therefore be considered astrosocial phenomena, because they are cohesive entities within their parent genre. Each is characterized by a cultural and literary history, identified by a specific body of work, motivated by a school of thought that pushes the writers engaging with it to improve on its past achievements, and followed by a dedicated group of fans who share a particular appreciation for the thematic concerns it expresses. In the case of the three sub-genres mentioned above, these concerns are eminently space-related, focusing as they do on the creation of spacefaring societies, planetary colonization, the development of a galactic consciousness, the study of human societies in environments other than Earth, and more.

## CONCLUSION

In my opinion, Pass' (2007) decision to place science fiction on the non-astrosocial side of his diagram is fully justified. SF does not require astrosociological themes to function as SF (although it certainly uses them very often), and therefore the genre *taken as a whole* should not be included with astrosocial phenomena. However, the various sub-genres within science fiction that treat space-related matters (e.g. planetary romance, space opera, hard SF, and others) most certainly should. Whether we decide to analyze individual works belonging to those sub-genres as astrosocial triggers and/or individual expressions of astrosociological awareness on the part of the author, or whether we study the history and culture of a whole sub-genre to identify astrosocial trends within it, it seems clear that these fields have a lot to teach us. If anything, the key challenge in an astrosociological reading of science fiction narratives does not stem from their status, but rather from their treatment of their subject matter. Astrosociology is a scholarly discipline whose main aim is to inform, teach, and prepare the bulk of the public for the onset of the age of space colonization and space flight; science fiction is a literary genre whose key function is to tell stories. SF's job is to allow writers to use its themes and narrative strategies to invent stories about people and places that never existed, and in doing so to say something about what it means to be human, and what this meaning may become one day. In a certain sense, the objectives of these two disciplines are startlingly similar, but an attempt to read a work of science fiction in the hope of extracting direct, literal lessons from the information contained in the text will, in all likelihood, yield fairly useless results. Stories are advocacies built upon a figment of one's imagination, not scholarly papers built on hard evidence, and even though science fiction is often far more factually savvy than most other fictional genres, it is still a literature. Indeed, from this characteristic come both its appeal for its fans and practitioners and its usefulness for astrosociology: its existence is spent in a state of constant negotiation between the attitudes of the disciplines indicated in the two words making up its name – the sciences (the rational, Apollonian part of human nature) and the arts (the irrational, Dionysian part). It is likely that the human venture into space, for all the research and the experimentation that will go into it, will partake of both sides in equal measure.

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