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# Towards a Definition of Science Fantasy

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> Without faith that nature is subject of law, there can be no science.
> > Norbert Wiener, *The Human Use of Human Beings*
>
> But I was leading up to the subject of 'natural law.' Is not the invariability of natural law an unproved assumption? Even on Earth?
> > Robert Heinlein, *Glory Road*
>
> The poet should prefer probable impossibilities to improbable possibilities.
> > Aristotle, *The Poetics*

To discover a point of intersection between fantasy and SF,[1] we might do well to begin first with fictional worlds in general and then turn to SF in particular, in part because the latter is a narrative genre rather orderly and susceptible of definition. A fictional universe necessarily consists of two major components or systems, roughly equivalent to the lexicon and syntax of a language—a *world* and a *story*. The former includes the total repertoire of possible fictional entities—i.e., the characters, settings and objects (in SF these would include gadgets, inventions, discoveries, and so forth) that occupy the fictional domain. The *story* connects and combines the various entities that make up the world; at an abstract level it consists of a systematic set of rules governing the arrangement and interaction of those entities. Now the generic distinctiveness of SF lies not in its *story* but in its *world*. The various plots of SF, once divested of their alien, otherworldly, or futuristic appurtenances, tend to coincide with the plots of realistic fiction.[2] In order to understand the nature of SF and its cognitive possibilities, we must examine the unique configuration of its *worlds*. When discussing a fictional world, to avoid the implicit assumptions that the characters are human and the settings terran, I shall use the terms *actants* and *topoi*; a world consists of a number of actants who populate, occupy, or exist in certain implicit or expressly particularized topoi.

The next step in our definition involves establishing a standard with which to compare the object of inquiry. In this respect, Lubomir Dolezel offers the following suggestion: "The study of possible narrative worlds will be facilitated, if we can define a *basic* narrative world to which all others will be related as its alternatives. It seems natural to propose for this role the narrative world which corresponds to our actual, empirical world" (pp. 9-10). As regards SF, Darko Suvin specifies that the basic narrative world corresponds to "the 'zero world' of empirically verifiable properties *around the author*" (p. 11; emphasis added). It happens in SF that narrative motifs or entities which, at the time of their inscription, represent a depar-

ture from the author's empirical environment become actualized in a later empirical environment (e.g., submarines, space flight, atomic energy). Returning to our definition, then, we can say that the distinctiveness of SF rests in its generic license to situate itself in worlds *other* than the basic narrative world.[3] This license identifies SF as a narrative subgenre of Romance (recall that Wells referred to his early fictions as "scientific romances"). Any SF world necessarily contains a "representational discontinuity" (Scholes: 62), a factor of disjunction from the basic narrative world created by an actantial or topological transformation. One of the advantages that accrues to this type of narrative ontology has to do with the imaginative latitude granted the author. The author who inscribes an SF world is cut loose from some of the exigencies of mimesis; he or she is free to speculate, to fabulate, to invent. But the conventions of SF do not grant total license to the fictionist. Once the author has posited the representational discontinuity (and there may be more than one such factor), the conventions of the genre dictate that the author thereafter adhere to the laws of nature and the laws inherent in the scientific method; SF does not violate notions of possibility, cause and effect, irreversibility, verifiability, and the continuity of space and time. SF thus embeds its *novum* (Suvin: 3), or factor of discontinuity, within a discourse informed by the assumptions of a scientific epistemology; the actants or topoi may be alien, but the discourse insists that they are subject to scientific explanation. Given these features, SF can indeed be said to possess a "deep structure that unites in some way scientific necessity and imaginative freedom" (Huntington: 161). In fact, this counterpoise between creative latitude and scientific necessity in part distinguishes pure SF from pure fantasy. The *worlds* of the latter are under no obligation to be faithful to a scientific epistemology; in such *worlds*, various forms of magic can govern the relations between human and natural realms, and all sorts of fantastic or impossible actants might flourish, without any scientific motivation or rationale.

If there is a critical consensus about the nature of fantasy, it is that fantasy in some way violates the conventional norms of possibility.[4] As one critic says, fantasy writers "take as *their point of departure* the deliberate violation of norms and facts we regard as essential to our conventional conception of 'reality,' in order to create an imaginary counter-structure or counter-norm" (Fredericks: 37). It should be stressed that this contravention of possibility is deliberate and conscious; fantasy is informed by an attitude that "admits fabulous and supernatural beings (other than God) have no objective existence while at the same time insisting that art has the right to invoke and describe such beings" (Petzold: 16). SF, on the other hand, because it accepts the dictates of scientific necessity, attempts to make its worlds conform to the norms of scientific possibility. As Mark Rose has noted, "by invoking the scientific ethos to assert the possibility of the fictional worlds it describes, science fiction differentiates itself from fantasy" (p. 20).

These two narrative forms, SF and fantasy, do have a locus of intersection, which we will term *science fantasy*, an unstable hybrid form combining features from each subgenre.[5] As argued above, an SF world introduces a

factor (or factors) of discontinuity or estrangement into its system of actants and topoi, but once that factor is posited, the world does not violate natural laws or a scientific epistemology. A fantasy world, on the other hand, is free to contravene both natural laws and the scientific epistemology in creating and concatenating its actants and its topoi. A fantasy world is distinguished by a "full 180-degree reversal of a ground rule" (Rabkin: 91), a contravention of the conventional norms of possibility; the discourse of fantasy never naturalizes its fantasy elements and oftentimes paradoxically affirms both their existence and their impossibility. The introduction of a fantasy actant (like a ghost, witch, demon, sorcerer, ghoul, or dragon) signals the fact that in that world the laws of physical science have been suspended. A science-fantasy world, then, would be one in which the actants or topoi presuppose at least one deliberate and obvious contravention of natural law or empirical fact, but which provides a scientific rationale for the contravention and explicitly grounds its discourse in the scientific method and scientific necessity. Science fantasy, like SF, assumes "an orderly universe with regular and discernible laws" (Allen: 7), but like fantasy, it contains at least one violation of the laws that we derive from the current state of science. A science-fantasy world has all of the predicates that we associate with S-F worlds—logical consistency, predictability, regularity, accountability, comprehensibility. In such a world, an organized or "scientific" explanation can be formulated for whatever happens. The source, validity, cogency, or plausibility of that explanation is not at issue; indeed, frequently the explanation draws on questionable analogies, imaginary science, far-fetched gadgets, or counterfactual postulates. Even so, the science fantasy is rooted in a discourse which takes for granted the validity of the scientific episteme and which therefore provides a quasi-scientific rationale for its reversals of natural law. As a matter of fact, the scientific discourse of science fantasy serves to validate the counterscientific element, convincing us of its plausibility. The "science" in science fantasy represents "an attempt to legitimize situations that depend on fantastic assertions" (Waggoner: 19).

In order to elaborate on the discourse of science fantasy, I would like to look in some detail at two science-fantasy "meta-texts," texts which interrogate the boundaries of the genre; namely, Fritz Leiber's *Conjure Wife* (1953) and Stanislaw Lem's *The Investigation* (1959; English translation, 1974). Leiber's novel is of interest to this essay just because it thematizes the contradiction inherent between science and magic as ways of understanding and dealing with the human condition; that is, it incorporates the tension and conflict between the two into both its story and its discourse. The hero, Norman Sayler, is a sociology professor at a small, exclusive, snobbish New England college. His field of study is ethnology, and he has specialized in feminine psychology in relation to magic and the parallels between primitive superstition and modern neuroses. In other words, his life's work has been to document the extent to which primitive customs and beliefs survive and to put them into an explanatory scientific framework. He firmly believes in "the systematic use of the scientific method" (4:35).

His ordered and orderly universe unravels one day when, snooping through his wife's possessions, he discovers that she (Tansy) has herself

been practicing conjure magic. When confronted, she admits that she has been using spells and charms, but only to protect him and advance his career. In one "session" that lasts an entire evening, Norman convinces his wife that she must repudiate entirely these superstitious beliefs and practices, and together they burn all her charms and totems. Not surprisingly, in the next few days Norman suffers a series of minor and major disasters and reversals. A former student who feels that Norman was responsible for his dismissal from school makes a pathetic attempt on Norman's life; a sexually frustrated coed accuses him of having seduced her; a colleague discovers an obscure manuscript which seems to have anticipated Norman's own scholarship, thus implicating him in an act of plagiarism; the college offers the departmental chair to an inept colleague; even in his private life Norman falls prey to a number of accidents and mishaps. Naturally he is tempted to connect these setbacks with the destruction of his wife's protective charms, but he rejects the possibility out of hand, because that way lies madness: "Thoughts are dangerous, he told himself, and thoughts against all science, all sanity, all civilized intelligence, are the most dangerous of all" (10:96).

His personal and professional fortunes continue to deteriorate, and he begins to entertain the notion that all women are to some degree and with varying aptitudes practicing witches:

> Why not carry it a step further? Maybe all women were the same. Guardians of mankind's ancient customs and traditions, including the practice of witchcraft. Fighting their husbands' battles from behind the scenes, by sorcery. Keeping it a secret; and on those occasions when they were discovered, conveniently explaining it as feminine susceptibility to superstitious fads.
> Half the human race still actively practicing sorcery.
> Why not? (6:66)

He discovers, moreover, that three women in particular, wives of influential colleagues, are conspiring to sabotage his career and destroy him and his wife. But he categorically refuses to admit that he is dealing with *real* witchcraft, instead attributing the aberrant behavior to the neuroses and hysteria of suggestible women.

The conflict between the parties escalates, until Norman is thrown into a situation where he is quite literally battling this diabolical trio for the possession of his wife's soul. His wife leaves him the instructions for a counterspell, but he is reluctant to carry them out—to do so is "to compromise with magic" (12:120). Even at the crucial moments, as the clock moves on towards midnight, he hesitates: "But to tackle it in dead seriousness, to open your mind to superstition—that was to join hands with the forces pushing the world back to the dark ages, to cancel the term 'science' out of the equation" (14:132). At the last moment he goes ahead with the counterspell, arguing to himself that he must do everything to save his wife, in order to keep faith with a loved one. As he struggles to put the spell together, he comes to a startling realization:

> Then, in one instant of diabolic paralyzing insight, he knew that *this* was sorcery. No mere puttering about with ridiculous medieval implements, no effortless sleight of hand, but a straining, back-breaking struggle to keep control of

> *forces summoned*, of which the objects he manipulated were only the symbols....
>     He could not believe it. He did not believe it. Yet somehow he *had* to believe
> it. (14:134)

In the denouement that follows, Norman not only devotes himself to
the  mastery of sorcery (eventually defeating his adversaries with their own
weapons); he even begins to put the discipline on a scientific footing. By
theorizing and rationalizing magic, he turns it into a kind of bastardized sci-
ence, for which "the basic formulas and the master-formulas have never
been discovered" (16:158). Indeed, a mathematical analysis of the symbolic
logic of a number of spells gives him the master formula with which he
defeats his enemies. In other words, the scientific method produces the
equivalent of super-magic. All the while Norman tries to convince himself
that he is acting out an elaborate charade for his wife:

> What strangeness pressing on the heels of strangeness it was, Norman
> thought dreamily, not only to pretend to believe in black magic in order to
> overawe three superstitious, psychotic women who had a hold on his wife's
> mental life, but even to invoke the modern science of symbolic logic in the
> service of that pretended belief. (18:173)

And yet in the next moment he admits to himself that these are "stuffy
rationalizations" (18:174), that his wife's soul has indeed been stolen.
    In terms of our own discussion of science fantasy as a genre, we can
say that *Conjure Wife* plainly draws on actants and forces and motifs that
we associate with traditional fantasy; that, like the protagonist, the reader is
"wrench[ed]...away from rationality" (20:196) in a short period of time.
Leiber does turn the novel in the direction of science fantasy by naturalizing
magic in the final chapters, more specifically by converting it into a "soft"
science (like psychology, according to Tansy).[6] The scientific paradigm is
modified so as to make room for magic. In this way Leiber draws attention
to the compulsive need of the scientific mentality to domesticate or master
the most anomalous phenomena.
    The work thus foregrounds and interrogates the scientific episteme in
general. As will be seen, this kind of interrogation constitutes science fanta-
sy's central theme. The scientific explanation of magic is based on analogy
and is not particularly convincing, but by dramatizing the tension between
magic and science and by inserting magic into a naturalizing discourse,
Leiber has created a science-fantasy novel.
    It is instructive to pair *Conjure Wife* with another novel which explores
the tensions between scientific and unscientific explanations for supernatu-
ral phenomena, but which avoids any reference to occultism or magic:
Lem's *The Investigation*. Like *Conjure Wife*, *The Investigation* interrogates
the very terms of its narrative identity, exploring the limits of the scientific
method in the face of an inexplicable universe; its focal point is "what its
title announces it to be: not...the phenomena being investigated, but the
process of investigation itself" (Philmus: 196). Moreover, as George Guffey
points out, in the novel Lem takes on both 19th- and 20th-century scientific
paradigms, both Newtonian and quantum physics, both inductive/deductive
reasoning and statistical analysis.

When dead bodies begin to disappear from various morgues in England, apparently of their own volition—a series of resurrections, as it were— Scotland Yard, in the person of the untried Lieutenant Gregory, is called in to investigate. He is assisted in the investigation by the brilliant but eccentric statistician Dr Sciss. Although their approaches are radically different, both men share a faith in the inviolability of "facts" and in the ability of reason to explain the apparently inexplicable. Gregory is looking for a human perpetrator of the body-snatchings; Sciss is looking for some mathematical correlation between the disappearances and the circumstances surrounding them, because between any two phenomena "there is always a definite correlation, a valid basis for a discussion of causes and effects" (1:22). Indeed, Sciss discovers a mathematical pattern, a regularity, to the incidents of "resurrection," one involving factors of time, space, and temperature: that is, the product of the distance and the time between consecutive incidents, multiplied by the temperature differential, is a constant. The implications of Sciss's findings are summarized as follows by Gregory's boss, Chief Inspector Sheppard: "[T]he pattern that emerges from our series of incidents is impersonal. Impersonal, like a natural law of some kind....The mathematical perfection of this series suggests that there is no culprit" (2:43). Gregory recoils instinctively from this reasoning, insisting that there must be a human agent behind the episodes.

But Gregory admits that the case is peculiar, paradoxical. At face value the disappearances seem to be the work of a psychopath, a maniac, but this hypothesis is contradicted by the planning and methodicality of the alleged perpetrator. "Nothing very good. Nothing very good at all," he complains. "A series of acts without a single slipup, that's pretty bad....In fact it appalls me, it's absolutely inhuman" (2:39). And the mystery of the case is compounded by the fact that there seems to be absolutely no motive. The criminal has simply gone out of his way "to make it look like the bodies had come back to life" (2:44, 47). In his desperate need to have a human culprit, perhaps a very intelligent one, Gregory absurdly focusses his suspicions first on his boss, the Chief Inspector, and later on Dr Sciss. In fact, he goes so far as to harass the latter, frequently making a fool of himself. Trying to explain his unorthodox methods to his chief, he says, "You're right, sir....I acted like an idiot. And I have no excuse at all, except that I absolutely refuse to believe in miracles, and nothing is going to make me, even if I go crazy" (5:120).

In the course of his investigation, Gregory very nearly does lose his sanity, plunging deeper and deeper into a world which loses definition and clarity, becoming more and more surreal. Everything about his life—his colleagues, his landlords, the random people he encounters—begins to seem mysterious, enigmatic, unfathomable. He inhabits a Kafkaesque world peopled by freaks, dwarves, eccentrics, and the like; at one point he confuses his mirror image with that of a suspicious stranger. He gets a break in the case when a morgue stakeout turns up another "body-snatching," but the constable on patrol is knocked unconscious in a car accident (he was apparently running blindly from the scene of the incident), and all the evidence on the scene seems to point to a "natural" resurrection. As Gregory tells his chief, "The situation is much worse" (4:95).

Dr Sciss meanwhile continues his statistical analysis of the incidents and comes up with a solution of sorts. First he states his scientific credo:

> Science progresses by discovering the connection between one phenomenon and other phenomena, and this is exactly what I succeeded in doing....I was assigned to determine the cause of this seemingly abnormal series of phenomena, and, its uniqueness notwithstanding, to connect it with some other series of phenomena that was already familiar.... (4:108)

For him the "operative causes" are indeed "forces of nature" (4:106). It turns out that the region in which the disappearances have occurred happens also to have the lowest incidence of death from cancer over the last 20 years. The implication, as Gregory explains to his chief, is that a mutated organism of some sort, perhaps a virus, is responsible for the "miracles":

> The reasoning goes this way: cancer manifests itself in an organism as chaos; the organism itself, representing order as it is found in the life processes of a living body, is the antithesis of chaos. Under certain conditions, this chaos factor—that is, cancer, or more accurately, the cancer virus—is mutated, but it remains alive, vegetating in whatever medium is its host....Ultimately it undergoes such a complete transformation that it develops entirely new powers; it changes from a factor that causes chaos to one that tries to create a new kind of order, a...posthumous order. In other words, for a specific period of time it fights against the chaos represented by death and the decomposition of the body that follows death. To do this, the new factor tries to restore the life process in an organism whose body is already dead. (5:122)

Sciss also offers an alternative explanation, as if in passing: that this order-microbe or virus might have been planted by extraterrestrials who are curious about the mechanics of the human organism but wisely do not wish to interfere with living beings. In this account, the cancer correlation is complicated, but has to do with the fact that those who are relatively immune to the cancer organism are proportionately susceptible to the alien organism.[7]

As might be expected, Gregory rejects both solutions out of hand, because to accept them would be to repudiate everything he believes in. For one thing, solution number one would call in question Christianity, and, by extension, Western civilization in general. Suppose, Gregory says, there was a similar drop in cancer mortality in the Near East about 2,000 years ago, that "there was a series of alleged resurrections then also—you know, Lazarus, and...the other one" (5:124). In addition, his profession and his sanity rest ultimately on the firm belief that the world he inhabits, while not always sane, nonetheless is orderly and therefore subject to systematic explanation. As the novelist Black says to Gregory, "It's a matter of faith. You believe in a perpetrator because you have to" (6:143).

When the constable who had witnessed the "resurrection" during the morgue stakeout finally regains consciousness and in his final moments testifies that there was no human culprit, that the corpse got up of its own accord and stumbled drunkenly around, Gregory does approach the limits of his sanity. He begins to suspect that "Chaos is the law of Nature" (to quote Henry Adams), that the world is a kind of "soup with all kinds of things floating around in it, and from time to time some of them get stuck

together by chance to make some kind of whole" (7:179). In such a world absolutely anything is possible, and "blind chance, the eternal arrangement of fortuitous events" (7:180), governs all phenomena.

Chief Sheppard knows that such speculations are dangerous for "investigators," and so he fabricates for Gregory an elaborate and patently improbable "out," involving a demented lorry driver driven to irrational acts, like coffin-robbing, while working night shifts in the pea soup of the English fog. When Gregory asks if that is *really* how it happened, the chief replies in the negative, but adds, "it can become the truth" (7:186). And when Gregory wants to know why Sheppard has concocted such a contrived but plausible explanation, the latter's response is just as significant: "Well, in the final analysis...well, because I work at Scotland Yard, also" (7:187). With a deliberate fiction, he is able to give "a semblance of order to this disorder" and to insure that the two of them are not "left crying in the wilderness" (7:188).

It should be clear from the interpretative summary above that Lem is quite explicitly interrogating the bases upon which scientific explanations of the world rest. He is calling "into question both the mechanistic models that science latterly subscribes to and the teleological ones that man tends to fall back on when confronted with the inadequacy of a purely mechanistic scheme of things" (Philmus: 193; see also Guffey: 175). In so doing, he finally demystifies science itself, exposing it as a kind of enabling fiction, one which makes it possible for us to "do" things with the world while blinding us to the strangeness of the *suppenwelt* we inhabit. But at the same time Lem inscribes this interrogation of science in a text which relies on the conventions and procedures of the scientific method and which incorporates a number of quasi-scientific explanations into its discourse. And because the basic ground-situation—the premise that corpses might resurrect themselves—contravenes some basic natural laws and scientific givens, *The Investigation* can finally be described as a science fantasy.

To return to the task of definition, then, we can say that science fantasy inscribes a *counternatural* world within a naturalizing and scientific discourse. The forms that this counternaturalness can take are several; in fact, we can distinguish a number of science-fantasy types according to the nature of the contravention or violation that the author assumes in the creation of the fictional world.

Let us consider first a most problematic case, that of the time-travel story, since this case unfolds for us the fuzziness of science fantasy's contours. A conservative and conventional estimation of the current state of scientific knowledge rules that it is impossible to travel through time without violating several very basic physical laws. In "The Theory and Practice of Time Travel" (1975), Larry Niven spells out just what laws must be suspended or ignored, including conservation of matter, conservation of energy, and laws of motion in general. Since for him time travel is thus "impossible on any level" ("Afterword" to *The Flight of the Horse*, p. 211), Niven refuses to write SF that employs time travel as an estrangement device. But Niven admits that time travel would be admissible in a fantasy fiction, and he employs and foregrounds it in his collection of stories, *The Flight of the*

*Horse* (1973). In these stories, a time traveller named Svetz from the distant future travels into the past to bring back extinct species for a zoo. When he is told to bring back a horse, he brings back a unicorn; when he tries to capture a wolf, he gets stuck with a werewolf. In other words Svetz travels not into the past, but into the never-was, the land of fantasy. Because time travel "violates too many of the laws of physics and reason" ("Theory and Practice," p. 366), Niven can use it only within a fantasy format, where he says that it serves purposes of wish-fulfillment, enabling him to stage, for example, a fight between a human and a dragon.

Niven's theory and practice suggest that since time travel is impossible, time-travel stories must be fantasy. Indeed, some writers (Le Guin and Aldiss, for example) have conscientiously ruled it out of their serious SF. I would argue, however, that most time-travel stories are *not* science fantasy, and not simply because time travel is "probably impossible but difficult to disprove" (Benford: 83). A key text here is the most famous time-travel story of them all, Wells's *The Time Machine*, a "pure" example of SF. Niven argues that *The Time Machine* is SF because it uses only travel to the far future and thus avoids the paradoxes of time travel ("Theory and Practice," p. 363), but more important are the facts that within the "grapholect" (Rabkin, *Fantastic*, pp. 20-21), or writing practice of Wells's time, such a machine did not so clearly violate contemporary scientific possibility and that Wells provided for his machine a (now unconvincing) scientific rationale.

Once Wells had firmly embedded a time machine within an SF text, that gadget entered into the accumulating conventions of the genre where it could be appropriated and utilized by other SF writers. Any SF *novum* (like a time machine, FTL travel, and ESP) can become part of the repertoire of SF conventions and therefore a device or tool for other authors. It should be noted that conventionalized *novums* are indeed *devices*, that they serve as means to an end—namely, the introduction of the dominant or foregrounded *novum* in the fiction.[8] In other words, the conventionalized *novum* has in fact lost its status as *novum* and now serves as a device subtending the "real" *novum* (as when an FTL drive is used to stage an alien encounter). In addition, as Scortia points out (pp. 138-39), time travel can be engineered in a "pure" SF novel when its scientific rationale accords with the realm of possibility. In *Timescape* (1980), for example, Gregory Benford bases time travel of a sort on the tachyon, a hypothetical faster-than-light particle not excluded by relativity theory. And the protagonists of Paul Anderson's *Tau Zero* (1970) travel in time to the end of the universe and beyond by virtue of the time-dilation effect that occurs at speeds close to the speed of light. In short, despite the fact that time travel would seem to be the kind of impossibility associated with fantasy, it can be a purely SF motif when it is used as an enabling convention or when it is inscribed in a naturalizing and scientific discourse.

A science fantasy, then, must have as its *dominant novum* an entity or motif which explicitly violates standards of scientific possibility or empirical fact. There is a form of time-travel story which intrinsically violates reason, science, and common sense, and which therefore qualifies as science fantasy. I refer here to the "time-loop" story (see Lem's "Time Travel," pp. 75ff.),

in which an actant journeys via a time machine into his own past, meets up with himself at an earlier point in time, and supplies that former self with assistance based on future technologies or future events, thus solving the main conflict of the story. An extreme example is Heinlein's "All You Zombies," in which a traveller in time impregnates himself and gives birth to himself—the same actant is at once father, mother, and child. As Lem points out, time-loop stories frequently involve an act of *creation ex nihilo* and violate basic notions of cause-and-effect and before-and-after; these narrative structures are "internally contradictory in a causal sense" ("Time Travel," p. 76). Now although these stories can be read allegorically (for example, "All You Zombies" can be read as the literalization of philosophical solipsism and thus as a parody of that notion), the time-loop story more frequently devolves into a kind of intellectual game in which the fictionist is free to play with logical contradiction and pseudo-logical hypotheses or to parody the conventions of SF itself. As Niven says ("Theory and Practice," p. 366), this kind of story is a "form of fantasy superbly suited to games of logic." And these "games of logic" serve cognitive ends to the extent to which they call into question epistemological assumptions, empirical givens, or literary conventions.

     Science, in its largest sense, consists not only in a set of natural laws and a set of procedures based on a certain epistemology, but also in a respect for empirical givens, in a faith in the inalterability of accepted fact. It follows that one can create science fantasy by deliberately reversing or denying a given historical fact.[9] This is the case in "alternate history" science fantasies. In *Pavane* (1966) Keith Roberts imagines an alternate time-stream in which the Spanish Armada defeated the English fleet in 1588, resulting in a 1966 world dominated by a monolithic Catholic church. *Tunnel Through the Deeps* by Harry Harrison (1972) is set in an alternate present in which the United States are still colonies of Great Britain because the Americans lost the Revolutionary War. The most celebrated of alternate present fictions is Dick's *The Man in the High Castle* (1962). Dick imagines a 1960s' US which lost World War II to the Axis powers and which has been partitioned (*à la* East and West Germany) into two rival zones, the West Coast under the comparatively benign occupation of the Japanese, the East Coast under the brutal domination of pathological Germans. Alternate present worlds like these necessarily call into question received notions of history and progress and at the same time point out that cultural values are not absolute, that they are very much shaped by historical forces and events. They suggest the degree to which our view of things is a function of factors out of our control. Moreover, readers are encouraged to compare the alternate present with the actual present and see what the two worlds have in common. Dick's novel, for example, suggests that, like the characters in his counterfactual present, we live in a world in which "madmen are in power" (*MHC* 3:37), because those in power see themselves as agents, not victims, of history, because they believe they are godlike. An alternate present world then is science fantasy because it is created by extrapolation from a counterfactual postulate involving the reversal of a given historical fact. The extrapolated present of this "what if" world, though entirely imaginary,

nonetheless may address significant thematic concerns dealing with questions of history, progress, values, and assumptions.

If one way to create a science fantasy is to extrapolate from a reversal of historical fact, then a similar way would be to postulate a deviation from scientific fact and thus to envision a counterscientific world. The fictionist deliberately ignores the current state of scientific knowledge about a phenomenon in order to create a world that serves particular aesthetic ends. Frequently this contravention of scientific fact involves the planets of the Solar System, like Mars and Venus. C.S. Lewis, for example, admits that he put canals on Mars in his "Space Trilogy" despite the knowledge that such canals were an "optical delusion" ("On SF," p. 112). The stories in Bradbury's *The Martian Chronicles* (1950) all take place on a Mars populated by the ghosts and artifacts of a noble race that never was nor ever could be. As Eric Rabkin points out, "by giving Mars a breathable atmosphere..., Ray Bradbury announces that his work is not to be taken entirely as science fiction—and held exclusively to that genre's aesthetic criteria—but rather is to be read at least in part as a kind of fairy tale set in a realm miraculously hospitable to humanity" ("The Rhetoric of Science in Fiction," p. 25). A deliberate contravention of this sort changes the generic identity of the fiction, moves it in the direction of fantasy, and calls forth from its reader slightly different reading protocols.[10] The inscription of counterscientific worlds, these impossibly hospitable planets sometimes serve no apparent cognitive ends; these fabulous worlds are their own justification. As Lewis says, "Nor need the strange worlds, when we get there, be at all strictly tied to scientific probabilities. It is their wonder or beauty or suggestiveness that matter[s]" ("On SF," pp. 111-12).

A final form of science fantasy involves the introduction of a counternatural entity into the system of actants, but, unlike in pure fantasy, in a world grounded in both scientific discourse and scientific necessity. An actant is posited whose morphology, powers, or existence contravenes scientific possibility, but it appears in a world otherwise compatible with scientific necessity and inscribed in a scientific discourse. Robert Silverberg's "Majipoor" trilogy (*Lord Valentine's Castle* [1981]; *Majipoor Chronicles* [1982]; *Valentine Pontifex* [1983]), for example, recounts the epic struggle for global power on a sprawling planet colonized and governed for many centuries by humans sometime in the distant future. Although these humans have forgotten much of the science bequeathed to them by an earlier "golden age," their home planet Majipoor obeys the basic dictates of an extrapolative or speculative SF world. The two native Majipoorian species, however, the protean Metamorphs and the telepathic giant sea dragons, are sets of counterscientific actants who "turn" the fiction toward science fantasy. Similarly, in Anne McCaffery's "Dragonrider" series, the reader encounters a fictional world which conflates SF and fantasy elements. The dragons of Pern have the ability to breathe fire and to fly, but both abilities are given scientific rationales. Even so, the image of fire-breathing dragons in flight certainly recalls traditional fantasy, an impression that is reinforced by the fact that the dragons possess other "magical" powers, like precognition, telepathy, race memory, and time-travel. These fantasy ele-

ments, however, are embedded in a discourse predicated upon the validity of the scientific method and scientific necessity. In hybridized science fantasies like these (and those by Bradley, Moorcock, Antony, and Wolfe), it is the tension between apparently contrastive elements—magic/science, supernatural/natural, mysticism/empiricism—that structures and informs the themes and the plot. These fictions demonstrate that "man is not satisfied...with reason and science. He desires myth and magic, and if they do not exist, he will use science to create them" (Attebery: 241).

We can imagine a spectrum of "hybridized worlds"—worlds whose actants and events combine scientific and fantasy elements—along which we can locate the above examples and other problematic cases. At the SF end, we would find *Dune*, a novel whose fantasy elements are systematically naturalized and accounted for.[11] At the other end, we would find those novels which approach pure fantasy, like Zelazny's "Amber" or Norton's "Witchworld" series. At this end we would also find the fictions of E.R. Burroughs, A. Merritt, and E.E. ("Doc") Smith, borderline science fantasies which rely on "unbridled, swashbuckling fantasy while retaining the terminology of science fiction" (Attebery: 237). Occupying the center of the spectrum would be a novel like Le Guin's *Lathe of Heaven* (1971), in which the protagonist discovers that his dreams have the power to change reality. This kind of power is extremely counterscientific (so much so that it cries out for metaphorical and metaliterary readings), but in the novel the scientist Haber goes to some lengths to account for it in scientific terms (see especially chapter 9).

We can also locate the other forms of science fantasy along such a spectrum. At the SF end would be situated those alternate histories, like *The Man in the High Castle*, which entail the reversal of a single historical fact. Towards the fantasy end we would find the alternate histories like Randall Garrett's Lord Darcy stories of the Anglo-French empire (collected in *Murder and Magic* [1979] and *Lord Darcy Investigates* [1981]), in which the reversal of historical fact brings about an alternate present in which magic is the operative science. Lem's *The Investigation* would be near the center, on the SF side, whereas Lieber's *Conjure Wife* would be more towards the fantasy end. Even with such a spectrum there would be problematic cases. I would argue, however, that the narrative discourse can, in most cases, determine where on the spectrum the work belongs. We must examine the way in which the work presents and accounts for its fantasy elements. If the discourse rigorously and systematically naturalizes those elements, then the work approaches SF; if it does not, then the work approaches fantasy.

The last category—hybridized science fantasy—is certainly the "mainstream" of science fantasy and includes certain novels that have eluded typological definition. Sturgeon's *More Than Human*, for example, won the International Fantasy Award in 1954, but generally is treated as an SF novel of the "Golden Age." But SF "purists" have always been a little bit uncomfortable with the novel because of the way it brings together a group of urchins and strays with extraordinary, and counterscientific, psi-powers. If we recognize, however, that these children are really transformed fantasy

actants inserted into the prosaic and ordinary world of postwar America, then we see that Sturgeon was writing science fantasy, at a time when "hard" SF was generally the rule.

Joanna Russ has said of fantasy that it "very often imitates the structure of the pastoral; one escapes from the familiar into the strange or fantastic only to return to the familiar at the end of the story" (p. 55). Science fantasy frequently appropriates the same structure. A representative of the world of science, of rationality and empiricism, journeys forth to encounter the world of fantasy, mysteries beyond science's purview, the kind of phenomena which A. Merritt prefigures in the opening paragraphs of *The Metal Monster* (1920):

> In this great crucible we call the world—in the vaster one we call the universe—the mysteries lie close packed, unaccountable as the grains of sand on ocean's [*sic*] shores. They thread gigantic, the star-flung spaces; they creep, atomic, beneath the microscope's peering eye. They walk beside us, unseen and unheard, calling out to us, asking why we are deaf to their crying, blind to their wonder.
>
> Sometimes the veils drop from a man's eyes, and he sees—and speaks of his vision. (1:11)

The central action of such novels involves a struggle between the world of science and that of fantasy, sometimes an armed conflict or physical agony but certainly a struggle to comprehend, to explain, to understand, for a belief in the possibility of understanding lies at the heart of the scientific enterprise: "All of [these mysteries] I was certain lay in the domain of the explicable, could be resolved into normality once the basic facts were gained" (Merritt 6:48). The protagonist may indeed be able to put some sort of scientific gloss upon the phenomena he witnesses, but he returns to the normal world chastened, more credulous, wiser:

> But to me—to each of us four who saw those phenomena—their lesson remains, ineradicable; giving new strength and purpose to us, teaching us a new humility.
>
> For in that vast crucible of life of which we are so small a part, what other shapes may even now be rising to submerge us?
>
> In that vast reservoir of force that is the mystery-filled infinite through which we roll, what other shadows may be speeding upon us? Who knows? (Merritt 31:203)[12]

This encounter/return pattern is used in a number of science fantasies. In Merritt's *The Metal Monster*, botanist Walter Goodwin confronts the counternatural metal being and its quasi-human child Norhala in the remote regions of the Himalayas. In Elgin's *Yonder Comes the Other End of Time* (1986), Tri-Galactic Federation agent Coyote Jones, an advocate of "psience," meets and is defeated by the magical world of Ozark. In C.S. Lewis's *Out of the Silent Planet* (1938), Ransom, Devine, and Weston discover that Sol's fourth planet is not Mars, a world to be exploited, but Malacandra, a world presided over by Oyarsa, a powerful spiritual being. In Lindsay's *A Voyage to Arcturus* (1920), the adventurer Maskull is drawn into a journey from drawing-room London to the protean and fabulous

planet of Tormance, a world tied into spiritual and metaphysical realities. In each case the scientific mentality or approach is shown to be limited and is put in its place.

It is also interesting to note that many hybridized science-fantasy novels adhere to the traditional Romance archetype, perhaps because of the natural affinity between their respective worlds. For one thing, the fantasy actants of hybridized science fantasy presuppose a "world elsewhere," a marvelous or exotic topos in which one or more constraints of empirical reality or scientific necessity are suspended. In this world, the protagonist is endowed with certain counternatural powers or attributes, which give his or her adventures a larger-than-life quality. And those adventures frequently involve some sort of quest, either for a clearly defined object of desire or for the restoration of a shattered equilibrium. Most important, the recourse to fantasy allows the fictionist to stage the story in a universe invested with value, as opposed to the value-neutral universe of SF. C.S. Lewis depicts this movement from one universe to another when Ransom, aboard the spaceship, experiences the conversion of "Space" into "the heavens":

> But Ransom, as time wore on, became aware of another and more spiritual cause for his progressive lightening and exultation of heart. A nightmare, long engendered in the modern mind by the mythology that follows in the wake of science, was falling off him. He had read of 'Space': at the back of his thinking for years had lurked the dismal fancy of the black, cold vacuity, the utter deadness, which was supposed to separate the worlds. He had not known how much it affected him till now—now that the very name 'Space' seemed a blasphemous libel for this empyrean ocean of radiance in which they swam. He could not call it 'dead'; he felt life pouring into him from it every moment. How indeed should it be otherwise, since out of this ocean the worlds and all their life had come? He had thought it barren: he saw now that it was the womb of worlds,...No: Space was the wrong name. Older thinkers had been wiser when they named it simply the heavens. (*Silent Planet* 5:32)

It is this conversion of "Space" into "the heavens" which signals the movement from SF to science fantasy, from a phenomenal universe to a noumenal one. Like fantasy, science fantasy is free to invest its actants and motifs with a power or a pattern that is lacking in the purely phenomenal world of the senses and the value-neutral universe of SF. One critic has noted that "at the core of all romance forms appears to be a Manichaean vision of the universe as a struggle between good and bad magic" (Rose: 9).[13] Fantasy, a subset of romance, frequently appropriates both the realm of magic and the Manichaean axis informing that realm. Indeed, Le Guin argues that "most great fantasies contain a very strong, striking moral dialectic, often expressed as a struggle between the Darkness and the Light" (*Language of the Night*, p. 65). One critic, in fact, suggests that this ethical or moral dimension is critical for fantasy, that the genre is based on a faith in some kind of supernatural moral order, an order which "is important not because it offers excitement and fun and escape, but because it provides laws and moral values" (Wagoner: 26). Hybridized science fantasy frequently borrows from fantasy its ethical frameworks, its distinctions between good and bad magic. These distinctions are not always clear (one thinks here of Wolfe's

*The Book of the New Sun* [1982]),[14] but they can be made. In such fictions, the outcome is seldom really in doubt; at the end, the goal is secured, the forces of evil defeated or thwarted, order restored. Because of their formal shapeliness (a function of the Romance archetype), their Manichaean ethical axis, and their adherence to "poetic justice," these fictions satisfy sublimative needs; they speak to our desires and dreams. As Gene Wolfe says, they achieve the "spirit of fantasy," revealing the "mystery of things" (pp. 22, 23).

The problematics of hybridized science-fantasy worlds reveal to some extent what an unstable, dynamic, and polymorphic form science fantasy is. Questions of historical context, the current state of knowledge, discursive strategies, and dominant features must all be taken into account in identifying this elusive (not to say illusive) subgenre.

Why go to all that trouble? One might answer quite simply that it is important to be able to name a distinction which exists, that the possibility of making distinctions lies at the heart of genre theory. Or one might be more pragmatic than dogmatic, pointing out the use-value of such a distinction. In terms of literary history, this distinction enables us to locate certain problematic literary texts, to identify Poe's *The Narrative of Arthur Gordon Pym* (1838) and Verne's *Journey to the Center of the Earth* (1864) as science fantasies within the contexts of their respective cultural grapholects. It also enables us to name certain trends in contemporary fantasy and science fiction—namely, the movement from SF to science fantasy by writers like Silverberg, Moorcock, Anthony, and others. But still the question might be asked, "What's in a name?" Granted that science fantasy is a valid and thriving narrative form, why go to some lengths to define and particularize it? Why? Because distinctions become very important when different narrative genres mobilize different reading protocols; so that to name a type is to know how to read. At least one critic argues that fantasy and SF are "natural enemies" in terms of reading strategies:

> Two kinds of art [fantasy and science fiction] instruct us to respond with two different parts of ourselves, the emotional and the rational, and each kind sees responding to the alien with the other side of the self to be counterproductive. And the status of objects in the two universes is correspondingly different. In 'fantasy,' objects have primarily figurative status, whereas in 'science fiction,' the thing is *a thing*, a literal object. And again, each genre presents the alternative as a fundamental error: in 'fantasy,' people have to be taught that the object is an externalization of their internal reality—it is, in short, a metaphor —whereas, in 'science fiction,' to see the object as a projection of the self is akin to madness. (Rawlins: 165)

Several pages later, the critic summarizes as follows: "In fantasy, reason cuts us off from the instinctive wisdom of the irrational. In science fiction, reason liberates us from the narrowness of our humanity" (Rawlins: 168). The distinctions Rawlins is making between SF and fantasy as regards reason and emotion, internal and external reality, literal and figurative status of objects, are too absolute and simplistic, but the notion that the genres call for different reading strategies is a good one. Fantasy deals with the unreal,[15] SF with the unknown; this basic difference naturally affects the

ways in which these genres are recuperated or naturalized. And science fantasy, located as it is at the intersection of these two genres, is uniquely situated to speak to both our heads and our hearts, to provide both cognitive and sublimative satisfactions. The fact that science fantasy is grounded in the discourse of scientific necessity and adheres to the scientific method guarantees that its worlds will have an internal consistency or logical explicability that is intellectually satisfying. But the contravention of natural law or empirical fact that defines the genre makes possible the introduction of actants, motifs, and topoi which play upon a wide range of human emotional needs while at the same time suspending the mimetic contract and its attendant responsibilities. C.S. Lewis argues that therein lies the fascination of science fantasy:

> The last sub-species of science fiction [by which he intends what we have termed science fantasy] represents simply an imaginative impulse as old as the human race working under the special conditions of our own time. It is not difficult to see why those who wish to visit strange regions in search of such beauty, awe, or terror as the actual world does not supply have increasingly been driven to other planets or other stars. ("On SF," pp. 110-11)

Like "magic realism," another narrative species enjoying a burgeoning interest, science fantasy is an oxymoronic form. In the counternatural worlds of science fantasy, the imaginary and the actual, the magical and the prosaic, the mythical and the scientific, meet and interanimate. In so doing, these worlds inspire us with new sensations and experiences, with "such beauty, awe, or terror as the actual world does not supply," with the stuff of desires, dreams, and dread.

But perhaps the most important reason for identifying science fantasy is that because it mobilizes different reading protocols, it tends to circumscribe an area of thematic concern different from the thematics of either fantasy or SF. The cognitive dimensions of science fantasy are fuzzy and problematic, in part because the genre can take on very different forms and pose a wide variety of questions, in part because it approaches its thematic fields obliquely and in an exploratory way. But let me suggest the following general concerns. By reversing natural law or empirical fact, science fantasy questions their absoluteness and givenness; by asserting the primacy of an invented and counternatural world, it questions the nature of reality; by taking on the principles and conventions and facts which we take for granted, it tends to broach ultimate philosophical questions having to do with metaphysics, theology, cosmology, ontology, meta-theory (both scientific and literary), and mythopoeia. But most of all, because it stands poised between two opposing ways of conceiving the world, it addresses itself to the question of epistemology. As one critic says,

> the intrusion of the fantastic into what appears a science fiction text or a naturalistic text often simply alters the function of the fantastic material. Instead of being encouraged to think about questions of psychology and morality, the reader is being encouraged to consider matters of epistemology: how do we know what we think we know is accurate? It is the function of epistemology to relate any debate about the 'real' and the 'unreal' to the relationship between the known and the unknown. (Ketterer: 133)

In simplistic terms, SF deals with the known and the unknown, fantasy with the real and unreal. Science fantasy then mediates these two philosophical axes and explores their interrelationships. It explores the assumptions of SF by interrogating "science" in its broadest sense—i.e., systematic and methodical ways of apprehending, comprehending, and appropriating the physical world.[16] It explores fantasy by calling into question the impossibility and unreality of the spectral horrors and beautiful desires that haunt the value-laden worlds of our dreams. If "the real crux of the difference between fantasy and science fiction lies in the writer's attempt to present his ideas within the context of new assumptions about the way the world works" (Waggoner: 19), then the mixed genre of science fantasy is perfectly situated to interrogate those very assumptions. And it does.

It may well be that within the scientific community those assumptions are in the midst of a radical change because of recent developments in science itself. Prigogine and Stengers argue, in *Order Out of Chaos: Man's New Dialogue with Nature* (1984), that a post-modern science is in the process of emerging, a science based on a new alliance between humanity and the world. The new alliance links humanity to a natural world reconceived as perpetually changing, incredibly diverse, inexhaustibly inventive, one "in which reversibility and randomness are the rules" (p. 8). The attempt of "modern science" to master the world, a world of fixed and immutable laws, has given way to a post-modern "re-enchantment of the world," in which humanity rediscovers a respect for nature's mystery. Because natural processes involve complex, rapidly evolving systems which are highly sensitive to the minutest fluctuations, the smallest changes can make a difference, and "individual activity is not doomed to insignificance" (p. 313). This leads Prigogine and Stengers to conclude that "we can no longer accept the old *a priori* distinction between scientific and ethical values" (p. 312). If they are right, then it seems probable that this redefinition of nature and our relation to it, this re-enchantment, will produce a cultural climate in which counterscientific forms like science fantasy will flourish. In the long run, of course, it may turn out that these narratives are no longer counterscientific, in which case we will have to resume the process of naming.

## NOTES

1. Attempts to define science fantasy have been relatively few in number. The most substantial of them is Brian Attebery's contribution to the *Dictionary of Literary Biography*. He sees science fantasy as a hybrid category composed of anomalous cases which don't quite fit into the "two well-defined genres, science fiction and fantasy" (p. 236). His definition proceeds by examining those anomalous cases. Gary Wolfe's entry in his SF&F glossary admits that the term is "rather imprecise," but refers to it as a genre "in which devices of fantasy are employed in a 'science fictional' context" (*Critical Terms*, p. 107). The science-fantasy author Gene Wolfe says that "a science fantasy story is one in which the means of science are used to achieve the spirit of fantasy" (p. 22). The definition closest to the one presented in this essay is David Allen's: "Under this heading would go those stories which, assuming an orderly universe with regular and discoverable natural laws, propose that the natural laws are different from those we derive from our current

sciences" (p. 7). I have, in this essay, tried to build on these and other insights in a rigorous, systematic, and comprehensive way.

2. Thomas D. Clareson gives the following example of what can happen when one locates the uniqueness of SF at the level of plot: "The protagonist, an alien creature, invades and struggles to survive amid a hostile society which dominates the planet—as in *The Invisible Man* by Ralph Ellison." As Clareson points out, "the same old story can be told in a number of ways" (pp. 2, 3). Darko Suvin, the foremost theoretician of SF, also locates the uniqueness of the genre in its *world*: SF "should be defined as a fictional tale determined by the hegemonic literary device of a *locus* and/or *dramatis personae* that...are *radically or at least significantly different from the empirical times, places, and characters* of 'mimetic' or 'naturalist' fiction" (p. viii). It is SF's "representational discontinuity" (Scholes: 62) which distinguishes the genre, gives it its generic stamp. This granted, it should be added that the invented *world* of an SF text necessarily interacts with its *story*, generating and channelling its complications, confrontations, and resolutions. The *world* has precedence, primacy, and priority; but once the *world* is postulated, an ongoing dynamic is set up between *world* and *story*.

3. For an extended discussion of SF's *worlds*, see Malmgren, "Worlds Apart: A Theory of Science Fiction."

4. Gary Wolfe argues that the "criterion of the impossible...may indeed be the first principle generally agreed upon for the study of fantasy" ("Encounter," pp. 1-2). Irwin defines fantasy as "a story based on and controlled by an overt violation of what is generally accepted as possibility; it is the narrative result of transforming the condition contrary to fact into 'fact' itself" (p. 4). Delany identifies the level of subjunctivity for fantasy as "*could not have happened*" ("About 5,175 Words," p. 141). Russ elaborates on this notion as follows: "Fantasy...embodies a 'negative subjunctivity'—that is, fantasy is fantasy because it contravenes the real and violates it....In Delany's words, fantasy is what *could not have happened*; i.e., what *cannot* happen, what *cannot* exist....Fantasy violates the real, contravenes it, denies it, and insists on this denial throughout" (p. 52).

5. The analysis which follows perhaps suggests a diachronic process; i.e., that first fantasy and SF existed as recognizable and distinct genres, and then someone came along and (deliberately?) combined features from each genre, creating a hybrid form. This is the way that Gene Wolfe defines the genre. I must emphasize that I am describing a *synchronic system* in which at a moment in time, science fantasy can be situated at a point of intersection between the two genres. The fact that fictions by Poe, Verne, E.R. Burroughs, and A. Merritt can best be identified as science fantasies attests to the genre's historical pedigree.

6. Heinlein similarly tries to rationalize magic in two novellas of his, "Waldo" (1940) and "Magic, Inc." (1942). In "Waldo," see especially pp. 76ff. and 86ff. for Heinlein's attempt to "scientize" magic.

7. Philmus points out that Sciss's statistical and "probabilistic approach" is, like Gregory's Holmesian approach, also presented as problematic in the novel, in part because "any number of variables might yield the sort of correlation he posits between the disappearances in Norfolk and the (low) incidence of cancer in that region" (p. 195).

8. Cf. Attebery: "Such seemingly magical concepts as time-travel, telepathy, teleportation, precognition, and immortality are allowable [in SF] because they can be made to sound scientific. So many authors have proposed scientific rationales for such phenomena—warps in the space-time fabric, thought-wave amplifiers, anti-agathic drugs—that we now tend to accept them without second thought as a

valid part of scientific extrapolation. They are conventions, which like faster-than-light travel, open up the possibilities of the genre without seriously violating its rational basis" (p. 236).

9. Cf. Amis: "science fiction...maintains a respect for fact or presumptive fact, fantasy makes a point of flouting these" (p. 22).

10. Delany elaborates on the notion of reading protocols in "Generic Protocols: Science Fiction and Mundane."

11. *Dune* is an interesting case in point. I would argue that it is situated on the border between SF and science fantasy. I would use as evidence here the training of the protagonist Paul Atreides, which combines the magical witchcraft of the Bene Gesserit with the mathematical wizardry of the Mentats; the nature, size, and powers of the sand worms; and the parapsychological powers attributed to the main actants (Paul, his sister, his mother, the Bene Gesserit, and the Space Guild). Although these powers are scientifically grounded, they are invested in the novel with a mystical or supernatural dimension that nudges the novel in the direction of science fantasy. In fact, the novel itself is built around sets of oppositions (science vs. religion, ecological science vs. mysticism) which may be loosely gathered within the science/fantasy polarity. It might be argued that *Dune*'s popularity, which foreshadows that which science fantasy enjoys today, was a function of the way in which it balanced science and magic within an SF format.

12. It is this anti-cognitive aspect of some science fantasy which is responsible for Suvin's attack upon it. Suvin calls it a "misshapen genre," which dispenses with plausibility capriciously and "rejects cognitive logic" (p. 68). Although Suvin's objections do obtain for some science fantasy (especially space opera), I hope to show that he underestimates or passes over the cognitive possibilities of science fantasy in general.

13. SF, however, would be a Romance form rejecting such an ethical/noumenal framework. Suvin distinguishes between two value-oriented "estranged literary genres," namely "fantasy and folktale," both "anti-cognitive" forms: "their world is actively oriented toward the hero. The folktale...world is oriented positively toward its protagonist; a folktale is defined by the hero's triumph: magic weapons and helpers are, with the necessary narrative retardations, at his beck and call. Inversely, the fantasy world is oriented negatively toward its protagonist; a fantasy is defined by the hero's horrible helplessness....Thus in the folktale and the fantasy, ethics coincides with physics—positive (hero-furthering) in the first case, and [negative] (hero-denying) in the second" (p. 19). Most critics consider Suvin's "folktale" (the positively oriented world; cf. Tolkein's Færie) a subset of fantasy. Like Suvin, Rosemary Jackson tends to belittle positively-oriented fantasies; she considers them conservative, reactionary, and regressive because "they go along with a desire to cease 'to be,' a longing to transcend the human" (p. 156). Unlike Suvin, however, she sees real value in negatively oriented fantasy, "post-Romantic fantasy (as opposed to færy)" (p. 81), a subversive literature of the 19th and 20th centuries, in which supernatural or demonic motifs have been internalized and partially naturalized. This "secular" fantasy interrogates the category of the "real" and blurs the boundaries between good and evil, "the easy polarization of good and evil which had operated in tales of supernaturalism and magic" (p. 56). Though modern fantasy may problematize the moral dialect, the categories of good and evil to some extent inhere in fantasy, defined as it is by the notions of unreality, supernature, and Otherness. Cf. Jameson: "Yet surely, in the shrinking world of the present day,...it ought to be less difficult to understand to what degree the concept of good and evil is a positional one that coincides with categories of Otherness" (pp. 114-15).

14. *The Book of the New Sun* is, in many ways, an exemplary and all-inclusive science fantasy. For one thing, it incorporates an exhaustive array of fantasy actants and motifs—a feudal, "sword and sorcery" setting upon a fallen "Urth" of the far-distant future, witches and sorcerers, ape-men, vampire bats, supernatural water behemoths, fire creatures, mysterious "cacogens," the resurrection of corpses, mirrors that teleport creatures, and a magical jewel that heals and protects. But these phenomena are all, sooner or later, given a scientific gloss or an S-F explanation (the "cacogens," for example, turn out to be beneficent, but misunderstood, extraterrestrials). And yet, despite the interpolated glosses and the scientific terminology, there remains a fantasy/supernatural increment that is unaccounted for, an aura of mystery, an element of the "uncanny" (the protagonist's word). The tetralogy parades the basic themes of science fantasy—religion vs. science and their common basis in faith; the natural and the supernatural; the mystery beneath the commonplace; the danger of two-value systems; the relation of imagination and reality; the problematic grounds of knowledge—but it mediates its many polarities without resolving them, leaving certain mysteries intact and enigmas unsolved. *The Book of the New Sun* merits close and rigorous study, which I will undertake elsewhere.

15. Cf. Jackson: "[Fantasy's] introduction of the 'unreal' is set against the category of the 'real'—a category which the fantastic interrogates by its difference" (p. 4); and "[fantasy] *enters a dialogue with the 'real' and incorporates that dialogue as part of its essential structure*" (p. 36; itals. in original).

16. For a playful examination of the scientific method, see Stanley Schmidt's science fantasy, *Newton and the Quasi-Apple* (1975).

## WORKS CITED

Allen, L. David. *Science Fiction: A Reader's Guide*. Lincoln, NE: Centennial, 1973.

Amis, Kingsley. *New Maps of Hell: A Survey of Science Fiction*. NY: Harcourt Brace, 1960.

Attebery, Brian. "Science Fantasy," in *Twentieth Century American Science Fiction Writers*. Part 2: M-Z, ed. David Cowart & Thomas L. Wymer (Detroit: Gale Research Co., 1981), pp. 236-42.

Benford, Gregory. "Is There a Technological Fix for the Human Condition?" in Slusser & Rabkin's *Hard SF*, pp. 82-98.

Clareson, Thomas D. "The Other Side of Realism," in *SF: The Other Side of Realism*, ed. Clareson (Bowling Green, OH: Bowling Green UP, 1971), pp. 1-28.

Delany, Samuel R. "About Five Thousand One Hundred and Seventy Five Words," in Clareson, pp. 130-46.

————. "Generic Protocols: Science Fiction and Mundane," in *The Technological Imagination: Theories and Fictions*, ed. Teresa de Lauretis *et al.* (Madison, WI: Coda, 1980), pp. 175-93.

Dick, Philip K. *The Man in the High Castle*. 1962; rpt. NY: Berkley, 1982.

Dolezel, Lubomir. "Narrative Modalities," *Journal of Literary Semantics*, 5 (1976): 5-14.

Fredericks, S.C. "Problems of Fantasy," SFS, 5 (1978):33-44.

Guffey, George R. "Noise, Information, and Statistics in Stanislaw Lem's *The Investigation*," in Slusser & Rabkin's *Hard SF*, pp. 164-76.

Heinlein, Robert. *Waldo and Magic Inc.* 1940, 1942, 1950; rpt. NY: NAL, 1970.

Huntington, John. "Science Fiction and the Future," in Rose (ed.), pp. 156-66.

Irwin, W.R. *The Game of the Impossible: A Rhetoric of Fantasy*. Urbana: Illinois UP, 1976.

Jackson, Rosemary. *Fantasy: The Literature of Subversion*. London: Methuen, 1981.

Jameson, Fredric. *The Political Unconscious: Narrative as a Socially Symbolic Act*. Ithaca, NY: Cornell UP, 1981.

Ketterer, David. "Power Fantasy in the 'Science Fiction' of Mark Twain," in Slusser & Rabkin's *Bridges*, pp. 130-41.

Le Guin, Ursula K. *The Language of the Night: Essays on Fantasy and Science Fiction*, ed. Susan Wood. NY: G.P. Putnam's Sons, 1979.

Leiber, Fritz. *Conjure Wife*. 1953; rpt. NY: Ace, 1984.

Lem, Stanislaw. *The Investigation*, trans. Adele Milch. 1974; rpt. NY: Avon, 1976.

_____. "The Time-Travel Story and Related Matters of SF Structuring," trans. Thomas H. Hoisington & Darko Suvin, in Rose (ed.), pp. 72-88.

Lewis, C.S. "On Science Fiction," in Rose (ed.), pp. 103-15.

_____. *Out of the Silent Planet*. 1938; rpt. NY: Collier, 1965.

Malmgren, Carl D. "Worlds Apart: A Theory of Science Fiction," forthcoming in *Utopian Thought in America*, ed. Arno Heller & Walter Hölbling (Tubingen, West Germany: Gunter-Narr-Verlag, 1988).

Merritt, A. *The Metal Monster*. 1920; rpt. Westport, CT: Hyperion, 1974.

Niven, Larry. *The Flight of the Horse*. NY: Ballantine, 1973.

_____. "The Theory and Practice of Time Travel," in *Looking Ahead: The Vision of Science Fiction*, ed. Dick & Lori Allen (NY: Harcourt Brace Jovanovich, 1975), pp. 363-72.

Petzold Dietmar. "Fantasy Fiction and Related Genres," *Modern Fiction Studies*, 32:1 (Spring 1986):11-20.

Philmus, Robert M. "The Cybernetic Paradigms of Stanislaw Lem," in Slusser & Rabkin's *Hard SF*, pp. 177-213.

Prigogine, Ilya & Isabelle Stengers. *Order out of Chaos: Man's New Dialogue with Nature*. NY: Bantam, 1984.

Rabkin, Eric S. *The Fantastic in Literature*. Princeton, NJ: Princeton UP, 1977.

_____. "The Rhetoric of Science in Fiction," in *Critical Encounters II: Writers and Themes in Science Fiction*, ed. Thomas Staicar (NY: Ungar, 1982), pp. 23-43.

Rawlins, Jack P. "Contemplating the Alien: Fantasy and Anti-Fantasy in Science Fiction Film and Literature," in Slusser & Rabkin's *Bridges*, pp. 160-74.

Rose, Mark. *Alien Encounters: Anatomy of Science Fiction*. Cambridge, MA: Harvard UP, 1981.

_____, ed. *SF: A Collection of Critical Essays*. Englewood Cliffs, NJ: Prentice-Hall, 1976.

Russ, Joanna. "The Subjunctivity of Science Fiction," *Extrapolation*, 15 (1973): 51-59.

Scholes, Robert. *Structural Fabulation: An Essay on the Fiction of the Future*. Notre Dame, IN: Notre Dame UP, 1975.

Scortia, Thomas N. "Science Fiction as the Imaginary Experiment," in *Science Fiction, Today & Tomorrow*, ed. Reginald Bretnor (NY: Harper & Row, 1974), pp. 135-47.

Slusser, George E. & Eric S. Rabkin, eds. *Bridges to Fantasy*. Carbondale: Southern Illinois UP, 1982.

_____. *Hard Science Fiction*. Carbondale: Southern Illinois UP, 1986.

Suvin, Darko. *Metamorphoses of Science Fiction*. New Haven: Yale UP, 1979.

Tolkien, J.R.R. "On Fairy Stories," in *Essays Presented to Charles Williams* (London: Oxford UP, 1947), pp. 38-89.
Waggoner, Diane. *The Hills of Faraway: A Guide to Fantasy*. NY: Atheneum, 1978.
Wolfe, Gary K. *Critical Terms for Science Fiction and Fantasy: A Glossary and Guide to Scholarship*. NY: Greenwood, 1986.
_____. "The Encounter with Fantasy," in *The Aesthetics of Fantasy Literature and Art*, ed. Roger C. Schlobin (Notre Dame, IN: Notre Dame UP, 1982), pp. 1-15.
Wolfe, Gene. "What Do They Mean, SF?" *SFWA Bulletin*, 75 (1981):20-25.

# RÉSUMÉ

*Carl Malmgren.* **Vers une définition de la fantaisie scientifique.**—*La science-fiction et la fantaisie ont un lieu de rencontre, la fantaisie scientifique. Il s'agit d'une forme narrative instable qui combine des caractéristiques des deux genres. Les personnages, ou les décors ou les événements du monde de la fantaisie scientifique comportent au moins une violation évidente d'une loi de la nature ou d'une contrainte scientifique tout en fournissant clairement une explicaiton structurée ou scientifique de cette même violation et en basant son discours sur une épistémé scientifique. La fantaisie scientifique, comme la science-fiction, présente un univers ordonné doté de lois communes, mais tout comme la fantaisie, elle contient au moins une inversion explicite d'une loi naturelle admise. Nous pouvons établir les frontières et les préoccupations thématiques de cette forme narrative en examinant deux récits de science fantaisie: l'écrit de Fritz Leiber,* Conjure Wife *(1953) et celui de Stanislaw Lem,* The Investigation. *C'est à partir de l'essence de la violation de la loi naturelle que nous pouvons distinguer différents types de science fantaisie. Les quatres types impliquent: la boucle du temps; les mondes successifs au présent; le monde anti-scientifique et le monde hybridé. En tant que sous-genre, la fantaisie scientifique interroge la science en doutant des connaissances scientifiques de base concernant le monde réel. Par la même occasion, elle scrute la fantaisie en interrogeant l'illusion des terreurs et des désirs qui hantent le monde onirique si riche en valeurs. La fantaisie scientifique est de plus en plus populaire, tout comme le «réalisme magique» auquel elle s'apparente par certains côtés. Cette popularité s'explique car, d'une certaine façon, dans ces mondes contre nature, le réel et l'imaginaire, le prosaïque et le magique, le scientifique et le mythique peuvent se rencontrer et s'influencer et également parce que ces mondes nous procurent «une telle beauté, une telle surprise ou une telle terreur absentes du monde réel» (C.S. Lewis). (CM)*

**Abstract.**—*SF and fantasy have a locus of intersection, science fantasy, an unstable narrative form which combines features from each genre. A science-fantasy world is one in which the characters or settings or events presuppose at least one clear violation of natural law or scientific necessity, but which explicitly provides an organized or scientific explanation for that violation and which grounds its discourse in a scientific episteme. Science fantasy, like SF, assumes an orderly universe with regular laws, but, like fantasy, contains at least one explicit reversal of current natural law. An examination of two science-fantasy texts, Fritz Leiber's* Conjure Wife *(1953) and Stanislaw Lem's* The Investigation *(1959), enables us to establish the boundaries and thematic concerns of this narrative form. The types of*

*science fantasy can be identified by the nature of the violation of natural law. Four main types involve the time-loop motif, the alternate-present world, the counterscientific world, and the hybridized world. As a subgenre, science fantasy tends to interrogate science by calling into question basic scientific assumptions about the physical world. At the same time it explores fantasy by questioning the unreality of the terrors and desires that haunt the value-laden world of dreams. Like "magic realism," with which it shares some features, science fantasy is experiencing a growing popularity, in part because in its counternatural worlds, the actual and the imaginary, the prosaic and the magical, the scientific and the mythical, can meet and interanimate, in part because these worlds provide us with "such beauty, awe, or terror as the actual world does not supply" (C.S. Lewis). (CM)*