

“Hard” Science Fiction: Criticism and Speculations

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Abstract

The article aims to speculate on one of the most controversial terms in the sphere of fantastic literature – “hard” science fiction, providing these speculations with condensed and relevant excerpts from the works of specialists in the field. Nevertheless, the major part of the paper is an attempt to justify the high position of “hard” sci-fi among the other modes of science fiction, to test the strength of the proposed statements and draw conclusions on the basis of the discussion in absentia.

Keywords: science fiction; “hard” science fiction; genre; mode; literature; speculations; theme; problem; idea; characterization; technology; specific narration style; scientific exposition.

The air of the Nebula was, as always, stained blood-red. A corner of his mind tried to measure the redness — was it deeper than last shift? — while his eyes flicked around the objects scattered through the Nebula above and below him. The clouds were like handfuls of grayish cloth sprinkled through miles of air. Stars fell among and through the clouds in a slow, endless rain that tumbled down to the Core. The light of the mile-wide spheres cast shifting shadows over the clouds, the scattered trees, the huge blurs that might be whales. Here and there he saw a tiny flash that marked the end of a star's brief existence.

(Baxter §1:10)

Rees lives in a universe where the gravitational constant is a billion times that of the universe we know. Only, he doesn't know that, any more than he knows why time is measured in shifts — one legacy of a starship that came to grief in this strange cosmos, leaving the crew and the passengers and their descendants to eke out an existence in what is, by Earthly standards, a living hell. We ourselves would never want to live there, but we are fascinated by what it would be like to live there. Rees' universe doesn't exist, but Stephen Baxter convinces us, in *Raft* (1992), that it could.

Is this hard science fiction? Absolutely!

Is it literature? Well, that opens a whole can of worms!

Hard SF isn't the prevailing literary fashion, even within “genre SF” — that body of fiction published as “science fiction” in magazines and specialty book lines. On the one hand, *Star Trek* spin-offs, *Dragonrider* novels, and the like head the best-seller lists. On the other, the most critically-admired works are from the “metaphorical” school of Stanislaw Lem, Philip K. Dick, and, perhaps, even Ursula K. Le Guin. Whatever else can be said of a work like *Raft*, it is safe to predict that it will never show up in any literary canon — “conservative” or “radical” — any more than it will be a runaway commercial success.

Hard SF will always be a minority taste. When Robert A. Heinlein started writing SF for the “slick” magazines after World War II, he realized from the outset that he would have to minimize the science to reach a wider audience (10). When he finally did reach a mass book-reading audience, it was with *Stranger in a Strange Land* (1961), which stressed social and religious satire — Heinlein himself denied that it was SF at all (260). Frank Herbert's *Dune* (1965) doubtless caught up non-SF readers more for its Great Thoughts than for its ecology — as demonstrated by the sequels it spawned. Even Isaac Asimov, when he hit the best-seller lists with a series of belated Foundation/Robot novels, stressed social issues rather than hard science. Hard SF may become the stepchild of its own genre: it simply isn't the best way to make a living. Ask Stephen Baxter — or even Hal Clement.

Hard SF also seems to remain a stepchild of SF scholarship. Some critics, it seems, not only don't want to read hard SF, but don't want to read about it. Robert A. Collins, for example, faulted James Gunn's *The New Encyclopedia of Science Fiction*, for, among other things, a bias toward hard SF: in particular, he was irritated by Poul Anderson's "Alien Worlds" entry because it failed to discuss the "metaphorical uses" [of created worlds], which interest me more than the so-called 'scientific' ones." Collins cites Michael Bishop's "Rogue Tomato" as the kind of SF that should have been covered under "Alien Worlds" (12).

Although Collins may rightly believe that metaphorical SF was slighted in the Gunn encyclopedia, it is hard SF that is slighted elsewhere. David G. Hartwell, in his introduction to *The World Treasury of Science Fiction*, felt it necessary to defend an esthetic that once was taken for granted by genre- SF writers and fans:

I do not, of course, deny the metaphorical level of SF texts. I simply state the obvious, which somehow seems to have been lost in several decades of critical discussion: in a work of science fiction, the reader must grant the premise that whatever is stated as the case is literal and true. For instance, in Gerard Klein's "Valley of Echoes," the reader must believe that we are two hundred years in the future, exploring the planet Mars, not merely in some surreal landscape that embodies a metaphor for the human condition.

(xvii-xviii)

As Hartwell granted, this esthetic is limited almost entirely to American SF; elsewhere in the world, the kind of fiction exemplified by the Golden Age at John W. Campbell's *Astounding* seems to have been taken "as some kind of joke or as a repository of imagery to be used for purposes other than SF" (xvii). Of course, Hartwell's memory may be selective. Was there ever really any hard science in the work of A.E. van Vogt, a major contributor to *Astounding*? We have all heard or read anecdotes about what passed for science in much of the earlier genre SF at Hugo Gernsback's *Amazing Stories*. Perhaps there has always been hard SF and soft SF, and the debate between them goes back at least as far as the differences between H.G. Wells and Jules Verne.

Still, we all know what kind of genre SF Hartwell is talking about, and we also know that it hasn't travelled well abroad. Yet attitudes may be changing. Lem's most recent SF novel, *Fiasco*, is certainly closer to hard SF than any of his previous work (perhaps something was lost in their translation, but are we really to believe in the mimoids composed of neutrinos in *Solaris*, or the mix of oxygen and methane in the atmosphere of the world his astronauts visit in *The Invincible*?), even as it also retains the satirical edge of Lem's previous work. In its cosmic vision and its speculation on the evolution of advanced civilizations past our understanding, *Fiasco* has much the same feel as such contemporary American hard SF as Gregory Benford's *Across the Sea of Suns* and *Great Sky River*.

Benford, indeed, has raised the literary status of hard SF. But, paradoxically, he has not necessarily led us to appreciate the esthetic of hard SF as such. We could argue that in *Timescape*, for example, the appeal is not so much the scientific invention—a means of sending messages into the past in order to alter history and thus prevent a disaster in the present — as the characterization of scientists and the politics of science. *Against Infinity* involves the transforming of Ganymede, but the center of the novel is a retelling of William Faulkner's "The Bear," in which the alien called Aleph serves a metaphorical function. In *The Artifact*, the mini black hole is the maguffin for an international suspense thriller. Do we admire *Great Sky River* more as hard SF or as a heroic saga writ large?

Benford's novels are all hard SF, of course, but they are other things as well. Can hard SF be literature if it is not also these other things? Is there a literary experience characteristic of hard SF in and of itself?

We are all familiar with arguments to the contrary. We have even come to cringe at the mention of Hugo Gernsback, who, as Brian W. Aldiss once put it, reduced SF to "stories built like diagrams, and made clear like diagrams, and stripped of atmosphere and sensibility" (211). We can only chuckle at much of the hard SF of the Golden Age: for example, George O. Smith's *Venus Equilateral* stories, with their outdated technology (gigantic vacuum tubes and the like) inspiring rapture in cardboard characters. Nor do we have to look to the past for the embarrassments of hard SF: Robert L. Forward's *Martian Rainbow* is a recent case in point. We don't expect *War and Peace* from Forward, surely, but here he proves he can't even write a good techno-thriller. The politics of the novel (a general setting himself up as religious overlord of Earth) are so crude that we are reminded of Ray Cummings' *Tarrano the Conqueror* (1930) — those of us who can remember back that far! Forward fills his narrative with chunks of scientific exposition, until it resembles a lumpy porridge. And because he can't make his story work with the actual possibilities of terraforming Mars, he brings in a *deus ex machina* (literally: magical robots left by aliens of Christmas past). On the evidence of *Martian Rainbow*, we might well conclude that Forward should have stuck to writing technical articles, and that there is no point to discussing the art of hard SF because there simply isn't any.

Why discuss Forward at all, if he is such a poor writer? We have all seen much better hard-SF novels about Mars, such as Allen Steele's *The Labyrinth of Night* (which is also a much better political thriller, and even a far better tale of magical aliens). Because Forward is also the author of *Dragon's Egg*, a novel that won the praise of, among others, Frank Herbert, Hal Clement, and Isaac Asimov as an example of hard SF at its best, he is thus a test case. If *Dragon's Egg* is

really hard SF at its best, and *Martian Rainbow* is hard SF at its worst, what's the difference? It's no use pretending that the human side *Dragon's Egg* is any better. It isn't: Forward's astronauts therein are cut from the same cardboard as those generals, scientists, and technicians in *Martian Rainbow*. We simply don't notice them, because they aren't the story; the story is the *cheela*, the creatures Forward makes us believe could actually live on the surface of a neutron star.

Like any number of hard-SF novels, *Dragon's Egg* includes an appendix in which the author explains the scientific basis for his literary invention. It is all very speculative science, of course, but science itself is based on speculation: theories are advanced and then tested against reality. We have no way of testing Forward's theory against reality, but we trust him as both scientist and hard-SF writer not to knowingly contradict the known possibilities of the universe we inhabit. If *Dragon's Egg* were a fictionalized essay like its appendix, however, would we read it in the same way we actually read it as a novel? Make no mistake about it: if we appreciate *Dragon's Egg* at all, we appreciate it as a *literary* exercise — and this in spite of its obvious literary faults. (Forward is said by Lester del Rey to have needed considerable editorial help in order to produce an acceptable manuscript.)

When we read scientific articles or textbooks, we are like Sergeant Friday on *Dragnet*: we want "Just the facts, ma'am." We get more than just facts, to be sure, from the more imaginative writers of science like Stephen Hawking or Stephen Jay Gould (Forward isn't in their league, either). When we read SF, however, we are still reading fiction, and expect the imaginative experience of reading fiction. C.S. Lewis, in *An Experiment in Criticism* (1961), even suggested that literature should be judged by how it is read, and though his judgments are no more infallible than those of any other critic, he is (to my mind, at least) right on the mark as to how we experience literature.

In science fiction we experience the creative imagination of the author — a particular kind of imagination. It is not necessarily, certainly not entirely, the metaphorical imagination of Jorge Luis Borges or Italo Calvino. Neither is it necessarily, and certainly not entirely, that of the "cognitive estrangement" that has figured in so much critical discussion of SF since Darko Suvin advanced the theory some twenty years ago. There is nothing wrong with either kind of imagination, or the kinds of works that express it, or the kinds of criticism that interpret them. It is plain to see that Philip K.'s transformation into a giant tomato, in Bishop's "Rogue Tomato," is a metaphorical device. We don't need to be told that both the Bureaucracy and the Forest it seeks to exploit, in Arkady and Boris Strugatsky's *The Snail on the Slope* (1980), are estranging devices, intended to make us see our own world in a new light. But what are the *cheela* supposed to represent? According to the theory that metaphors are the essence of literature, they must represent something, or what good are they?

No doubt we could find something if we tried hard enough. In *The New York Review of Science Fiction*, Damien Broderick argues that the seemingly incomprehensible aliens of Philip Mann's *The Eye of the Queen* "resemble a child's idea of human adults," while the more comprehensible alien invaders of Larry Niven and Jerry Pournelle's *Footfall* are metaphors for the Russian, no doubt (1). But for true aficionados of hard SF, such explanations diminish their reading experience rather than enhancing it. If those aliens in *Footfall* exist only for the sake of a tired allegory about the Cold War, they hardly seem worth the trouble Niven and Pournelle have taken in creating them. SF critics certainly mean well in advancing such interpretations; they are, in fact, often praising SF in the only way they know how. One recalls the legal arguments about the redeeming social values of sexually explicit works: *Fanny Hill* is thus given a Significance that would baffle John Cleland.

The literal reading of SF seems to have few defenders, but one of them is no less than Samuel R. Delany, whose argument, though surely familiar to all of us, bears repeating here:

Such sentences as "His world exploded," or "She turned on her left side," as they subsume the proper technological discourse (of economics and cosmology in one; of switching circuitry and prosthetic surgery in the other), leave the banality of the emotionally muzzy metaphor, abandon the triviality of insomniac tossings, and, through the labyrinth of technical possibility, become possible images of the impossible.

(Triton 337)

Delany denies that SF is true literature: "Literature's philosophical arguments tend to be about the subject, the human consciousness, rather than about the way the real world functions. Science fiction is a critique of the object rather than a critique of the subject — or of the subject in terms of the object" ("Teaching to Learn" 74). Yet he also argues that "the science-fictional enterprise is richer than the enterprise of mundane fiction" (Triton 340), and he clearly means richer in a literary sense.

Delany may not have read *Dragon's Egg*, and he might not care for it any more than other critics sensitive to literary style, which he regards as inseparable from content (*The Jewel-Hinged Jaw* 35ff).⁶ Nevertheless, Forward's novel conforms to his theory that the essence of SF is the "technological discourse" that enables the SF writer to create "possible images of the impossible." By outlining the entire evolution of life on his neutron star (the *Cheela* begin as plants, using crystal-supported canopies extending above the hot crust as the basis of heat engines to supply their food/energy needs), Forward sets up a memorable scene later in the novel. It develops that the *cheela*, in extreme circumstances, can revert to

the plant stage — and that this even has a rejuvenating effect. Swift-Killer, a warrior explorer, discovers this by accident; and planetary dictator Soother-of-All-Clans later seeks to extend her life— and power — by going through such a metamorphosis deliberately. But she is too old and too sedentary; she has too little muscle tissue to draw on to build a crystalline structure for her canopy. Nevertheless, things seem to be going well — at first.

Then it happened. The tip of one of the weakened spikes broke as it attempted to tighten the skin. Soother's-First was horrified to see a jagged point of dragon crystal sticking up out of the torn fold of skin. The skin held for a while, and the scientists attempted to build a mound up against the side of the body to support the damaged section, but before the support could be arranged, an adjoining spike gave way under the unequal tension, and in a rapid series of sharp cracks and loud crashes, the remainder of the twelve-pointed skeleton broke and fell to the crust. (381)

We do not particularly like Soother, yet Forward has done his work so well that she seems real to us, and we feel a genuine terror at her fate. This is in spite of the fact that Forward's prose, here and elsewhere in *Dragon's Egg*, is not distinguished: nobody can mistake it for that of a Delany or a Zelazny, or even that of better hard-SF writers like Benford.

What is going on here? We are participating in a literary experience, but it isn't the kind of literary experience we have been taught to appreciate. What befalls Soother is a terrifying *event*, rather than a metaphor, and the feelings it evokes are those of a literal event. Cognition, as Suvin calls it, is certainly involved: it is the *novum* (again as Suvin calls it) that allows us to accept the reality of the scene. Yet we do not feel estranged from that reality; instead, we feel caught up and even entranced by it. That is what always happens in the best hard science fiction, and a better term for the esthetic effect of hard SF may be *cognitive engagement*. Forward uses the *novum* to engage us in a fascinating new reality, rather than to estrange us from a familiar one, and it is a distinctly *literary* reality that he creates. We do not read *Dragon's Egg* as we would a technical paper: whatever faults we may find with his clumsy style and characterization; we can still admire Forward as the creator of a unique *fiction*. It is precisely because *Martian Rainbow* offers nothing so unique (anyone writing hard SF about Mars must, of necessity, cover much the same scientific ground), and because Forward makes the error of trying to write the kind of human and political drama for which his limited talents in no way suit him, that we cannot forgive the same faults in that novel.

We find the same esthetic in other examples of hard SF that do not aspire to be literary in the prevailing sense. In John E. Stith's *Redshift Rendezvous* (1990), the human side of the plot is pure cornball, and Stith's characters as such are nothing to write home about. Yet we are caught up in a story that could take place only in the fascinating reality of a subspace where the speed of light is so low we can actually see the illumination spread to the far corners of the starship cargo hold when the lights are switched on. We trust Stith to have worked out all the logical consequences of his invented reality, but when we read his novel it is the literary experience of that reality we are looking for. The same principle applies to Baxter's *Raft*, in which we share the experiences of a hero who is at one point exiled to a labor camp on the hulk of a dead star: in Baxter's invented universe it is possible to live and work — albeit not very comfortably — on such a world. Neither *Redshift Rendezvous* nor *Raft* offers any significant psychological insight, political message, or metaphor about the human condition. Neither is "literature" as usually recognized. Yet each of these is a highly literary work in its own way.

Clement's *Mission of Gravity* is rightly recognized as one of the classics of hard SF. Yet Clement wrote a sequel, *Star Light*, which was quickly forgotten. The science was just as good in the second novel, but Clement was unable to recreate the literary excitement of the first. The reason is pretty obvious: the world Clement offers in *Star Light* is simply a dull world — and a dull world makes for a dull story. All sorts of amazing things happen on Mesklin, but practically nothing could happen of Dhrawn. The difference between the two worlds, and the stories they inspire, is the result of a *literary* rather than a scientific failure. Yet even a fairly conventional world can be redeemed by the literary excitement of hard SF. Rosemary Kirstein's *The Steerswoman* (1989), for example, is set on what seems at first a generic fantasy world of wizards and dragons. In the course of the story, however, we realize that the "wizards" are really just ordinary men using the secrets of science, as in Fritz Leiber's classic *Gather, Darkness* (1950), to awe the masses and that the "dragons" are only natural creatures. In the sequel, *The Outskirter's Secret* (1992), we learn that this world is threatened with disaster: something has gone wrong with what we can understand is a long-range terraforming project. But the protagonists in the story can't read the clues as we do, because they don't know the science we do: can they and will they discover the truth in time, and will they be able to do anything about it? We experience suspense, an element as old as fiction — but it is a suspense that derives entirely from our knowledge of science.

Hard science fiction may be a quite limited literary form, but the fact that it can create its own kind of literary experience — even when it has no other claim to literary value — shows that it is a *valid* literary form, and worthy of respect in its own right. Were it given this respect, we might have the experience of more works that, like *Dragon's Egg*, succeed as hard SF, however much they may be lacking in other virtues. We would still have Benford, in any case, but we might not be frustrated by lesser talents overreaching themselves: for example, John Cramer in *Twistor* (1990). This is simply an old-fashioned adventure story that takes too long to get going, seemingly because Cramer (doubtless having read Benford) thinks he has to devote the first half of the novel to academic politics and the like — which he just can't do

as well as Benford — to be taken seriously. We should try to remember that art, like gold, is where we find it — not necessarily where we look for it.

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