Space Opera: A term borrowed from Fandom, where it was coined by Wilson Tucker in 1941 to refer to the "outworn spaceship yarn" of the sort that had been prevalent in the pulps during much of the 1930s. Sometimes called adventure science fiction or science adventure, space operas are generally fast-paced intergalactic adventures on a grand scale, most closely associated with E. E. Smith, Edmond Hamilton, and the early Jack Williamson. Often characterized as westerns in space or "straight fantasy in science fiction drag" (Norman Spinrad), space opera may be either an historical or a generic term; contemporary films such as *Star Wars* have been labeled space operas, as have more complex works such as Cecilia Holland's 1976 novel *Floating Worlds*.

Wonder: Frequently invoked in definitions of fantasy but seldom defined, as in C. N. Manlove's phrase "a fiction evoking wonder." The term is equally common in discussions of science fiction with its "sense of wonder," but it is quite possible the meaning there is somewhat different, relating to philosophical notions of the undiscovered universe and romantic notions of the sublime in the face of vastness. In fantasy, the term need not imply awe and terror in the face of the natural world, but rather suggests the desire and longing arising out of the promise of other worlds or states of being. In this sense, the term is perhaps related to *Sehnsucht*. Casey Fredericks has characterized the "wonder effect" as "presenting both a radical and a recognizable change on the known world." As for the science fictional "sense of wonder," Samuel R. Delany has suggested that the phrase gained currency through the criticism of Damon Knight, and may have been borrowed from W. H. Auden's 1939 poem "In Memory of Sigmund Freud" (which spoke of the "sense of wonder" offered by the night). It is equally possible, however, that the phrase had gained some currency before the Auden poem, perhaps through the use of "wonder" in the titles of pulp magazines as early as 1929.

CHAPTER THREE

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Estrangement and Cognition[1]

Darko Suvin

1. Science Fiction as Fiction (Estrangement)

1.1. The importance of science fiction (SF) in our time is on the increase. First, there are strong indications that its popularity in the leading industrial nations (United States, USSR, United Kingdom, Japan) has risen sharply over the last 100 years, despite all the local and short-range fluctuations. SF has particularly affected such key strata or groups of modern society as college graduates, young writers, and the avant-garde of general readers appreciative of new sets of values. This is a significant cultural effect that goes beyond any merely quantitative census. Second, if one takes the minimal generic difference of the presence of a narrative novum (the dramatic personae and/or their context) significantly different from what is the norm in "naturalistic" or empiricist fiction, it will be found that SF has an interesting and close kinship with other literary subgenres that flourished at different times and places of literary history: the classical and medieval "fortunate island" story, the "fabulous voyage" story from antiquity on, the renaissance and baroque "utopia" and "planetary novel," the Enlightenment "state [political] novel," the modern "anticipation" and "anti-utopia." Moreover, although SF shares with myth, fantasy, fairytale, and pastoral an opposition to naturalistic or empiricist literary genres, it differs very significantly in

approach and social function from such adjoining non-naturalistic or meta-empirical genres. Both these complementary aspects, the sociological and the methodological, are being vigorously debated by writers and critics in several countries, evidence of a lively interest in a genre that should undergo scholarly discussion, too.

In this chapter, I will argue for an understanding of SF as the *literature of cognitive estrangement*. This definition seems to possess the unique advantage of rendering justice to a literary tradition that is coherent through the ages and within itself, yet distinct from nonfictional utopianism, from naturalistic literature, and from other non-naturalistic fiction. It thus makes it possible to lay the basis for a coherent poetics of SF.

1.2. I want to begin by postulating a spectrum or spread of literary subject matter that extends from the ideal extreme of exact recreation of the author's empirical environment[2] to exclusive interest in a strange newness, a *novum*. From the eighteenth to the twentieth centuries, the literary mainstream of our civilization has been nearer to the first of these two extremes. However, at the beginnings of a literature, the concern with a domestication of the amazing is very strong. Early tale-tellers relate amazing voyages into the next valley, where they found dog-headed people and good rock salt that could be stolen or at the worst bartered for. Their stories are a syncretic travelogue and *voyage imaginaire*, a daydream and intelligence report. This implies a curiosity about the unknown beyond the next mountain range (sea, ocean, solar system), where the thrill of knowledge joined the thrill of adventure.

From Iambulus and Euhemerus through the classical utopia to Verne's island of Captain Nemo and Wells's island of Dr. Moreau, an island in the far-off ocean is the paradigm of the aesthetically most satisfying goal of the SF voyage. This is particularly true if we subsume under this the planetary island in the aether ocean—usually the moon—that we encounter from Lucian through Cyran to Swift's mini-Moon of Laputa, and on into the nineteenth century. Yet the parallel paradigm of the valley, "over the range" (the subtitle of Butler's SF novel *Erewhon*), which shuts it in as a wall, is perhaps as revealing. It recurs almost as frequently, from the earliest folktales about the sparkling valley of Terrestrial Paradise and the dark valley of the Dead, both already in *Gilgamesh*. Eden is the mythological localization of utopian longing, just as Wells's valley in "The Country of the

Blind" is still within the liberating tradition that contends that the world is not necessarily the way our present empirical valley happens to be, and whoever thinks his valley is the world is blind. Whether island or valley, whether in space or (from the industrial and bourgeois revolutions on) in time, the new framework is correlative to the new inhabitants. The aliens—utopians, monsters, or simply differing strangers—are a mirror to man just as the differing country is a mirror for his world. But the mirror is not only a reflecting one, it is also a transforming one—virgin womb and alchemical dynamo: the mirror is a crucible.

Thus it is not only the basic human and humanizing curiosity that gives birth to SF. Beyond an undirected inquisitiveness, which makes for a semantic game without clear referent, this genre has always been wedded to a hope of finding in the unknown the ideal environment, tribe, state, intelligence, or other aspect of the supreme good (or to a fear of and revulsion from its contrary). At all events, the *possibility* of other strange, covariant coordinate systems and semantic fields is assumed.

1.3. The approach to the imaginary locality, or localized daydream, practiced by the genre of SF is a supposedly factual one. Columbus's (technically or genologically nonfictional) letter on the Eden he glimpsed beyond the Orinoco mouth, and Swift's (technically nonfactual) voyage to Laputa, Balnibarbi, Glubbdubbdrib, Luggnagg, "and Japan" represent two extremes in the constant intermingling of imaginary and empirical possibilities. Thus SF takes off from a fictional ("literary") hypothesis and develops it with totalizing ("scientific") rigor—the specific difference between Columbus and Swift is smaller than their generic proximity. The effect of such factual reporting of fictions is one of confronting a set normative system—a Ptolemaic-type closed-world picture—with a point of view or look implying a new set of norms; in literary theory this is known as the attitude of *estrangement*. This concept was first developed on non-naturalistic texts by the Russian formalists ("ostranenie," Viktor Shklovsky) and most successfully underpinned by an anthropological and historical approach in the work of Bertolt Brecht, who wanted to write "plays for a scientific age." While working on a play about the prototypical scientist Galileo, he defined this attitude ("Verfremdungseffekt") in his *Short Organon for the Theatre:* "A representation which estranges is one which allows us to recognize its subject, but at the same time makes it seem unfamiliar."

And further: for somebody to see all normal happenings in a dubious light, "he would need to develop that detached eye with which the great Galileo observed a swinging chandelier. He was amazed by that pendulum motion as if he had not expected it and could not understand its occurring, and this enabled him to come at the rules by which it was governed." Thus, the look of estrangement is both cognitive and creative; and, as Brecht goes on to say, "One cannot simply exclaim that such an attitude pertains to science, but not to art. Why should not art, in its own way, try to serve the great social task of mastering Life?"[3] (Later, Brecht would note that it might be time to stop speaking in terms of masters and servants altogether.)

In SF the attitude of estrangement—used by Brecht in a different way, within a still predominantly "realistic" context—has grown into the *formal framework* of the genre.

2. Science Fiction as Cognition (Critique and Science)

2.1. The use of estrangement both as underlying attitude and dominant formal device is found also in the *myth*, a "timeless" and religious approach looking in its own way beneath (or above) the empiric surface. However, SF sees the norms of any age, including emphatically its own, as unique, changeable, and therefore subject to a *cognitive* view. The myth is diametrically opposed to the cognitive approach since it conceives human relations as fixed and supernaturally determined, emphatically denying Montaigne's "*la constance même n'est qu'un branle plus languissant.*" The myth absolutizes and even personifies apparently constant motifs from sluggish societies. Conversely, SF, which focuses on the variable and future-bearing elements from the empirical environment, is found predominantly in the great whirlpool periods of history, such as the sixteenth through seventeenth and nineteenth through twentieth centuries. Where the myth claims to explain once and for all the essence of phenomena, SF first posits them as problems and then explores where they lead; it sees the mythical static identity as an illusion, usually as fraud, at best only as a temporary realization of potentially limitless contingencies. It does not ask about "The Man" or "The World," but which man? In which kind of world? And why such a man in such a kind of world? As a literary genre, SF is fully as opposed

to supernatural or metaphysical estrangement as it is to naturalism or empiricism.

2.2. SF is, then, a literary genre whose necessary and sufficient conditions are the presence and interaction of estrangement and cognition, and whose main formal device is an imaginative framework alternative to the author's empirical environment.

Estrangement differentiates SF from the "realistic" literary mainstream extending from the eighteenth century into the twentieth. Cognition differentiates it not only from myth, but also from the folk (fairy) tale and the fantasy. The *folktale* also doubts the laws of the author's empirical world, but it escapes out of its horizons and into a closed collateral world indifferent to cognitive possibilities. It does not use imagination as a means of understanding the tendencies latent in reality but as an end sufficient unto itself and cut off from the real contingencies. The stock folktale accessory, such as the flying carpet, evades the empirical law of physical gravity—as the hero evades social gravity—by imagining its opposite. This wish-fulfilling element is its strength and its weakness, for it never pretends that a carpet could be expected to fly—that a humble third son could be expected to become king—while there is gravity. It simply posits another world beside yours where some carpets do, magically, fly, and some paupers do, magically, become princes, and into which you cross purely by an act of faith and fancy. Anything is possible in a folktale, because a folktale is manifestly impossible. Furthermore, the lower-class genre of folktale was from the seventeenth to eighteenth century on transformed into the more compensatory, and often simplistic, *individualist fairytale*. Therefore, SF retrogressing into *fairytale* (for example, "space opera" with a hero-princess-monster triangle in astronautic costume) is committing creative suicide.

Even less congenial to SF is the *fantasy* (ghost, horror, gothic, weird) tale, a genre committed to the interposition of anti-cognitive laws into the empirical environment. Where the folktale is indifferent, the fantasy is inimical to the empirical world and its laws. The thesis could be defended that the fantasy is significant insofar as it is impure and fails to establish a superordinated maleficent world of its own, causing a grotesque tension between arbitrary supernatural phenomena and the empirical norms they infiltrate. Gogol's Nose is significant because it is

walking down the Nevski Prospect, with a certain rank in the civil service, and so on; if the Nose were in a completely fantastic world—say H. P. Lovecraft's—it would be just another ghoulish thrill. When fantasy does not make for such a tension between the supernatural and the author's empirical environment, its monotonous reduction of all possible horizons to Death makes of it just a subliterature of mystification. Commercial lumping of it into the same category as SF is thus a grave disservice and rampantly sociopathological phenomenon.

2.3. The *pastoral*, on the other hand, is essentially closer to SF. Its imaginary framework of a world without money-economy, state apparatus, and depersonalizing urbanization allows it to isolate, as in a laboratory, two human motivations: erotics and power-hunger. This approach relates to SF as alchemy does to chemistry and nuclear physics: an early try in the right direction with insufficient foundations. SF has much to learn from the pastoral tradition, primarily from its directly sensual relationships that do not manifest class alienation. This lesson has in fact often been absorbed, whenever SF has sounded the theme of the triumph of the humble (Restif, Morris, and others, up to Simak, Christopher, Yefremov, etc.). Unfortunately, the baroque pastoral abandoned this theme and jelled into a conventional sentimentality, discrediting the genre; but when pastoral escapes preciosity, its hope can fertilize the SF field as an antidote to pragmatism, commercialism, other-directedness, and technocracy.

2.4. Claiming a Galilean estrangement for SF does not at all mean committing it to scientific vulgarization or even technological prognostication, which it was engaged in at various times (Verne, the United States in the 1920s and 1930s, USSR under Stalinism). The needful and meritorious task of popularization can be a useful element of SF works at a juvenile level. But even the *roman scientfique*, such as Verne's *From the Earth to the Moon*—or the surface level of Wells's *Invisible Man*—though a legitimate SF form, is a lower stage in its development. It is very popular with audiences just approaching SF, such as the juvenile, because it introduces into the old empirical context only *one* easily digestible new technological variable (moon missile or rays that lower the refractive index of organic matter).[4] The euphoria provoked by this approach is real but limited, better suited to the short story and a new audience. It evaporates much quicker as positivistic

natural science loses prestige in the humanistic sphere after the world wars (compare Nemo's *Nautilus* as against the U.S. Navy's atomic submarine of the same name), and surges back with prestigious peacetime applications in new methodologies (astronautics, cybernetics). Even in Verne the "science novel" has a structure of transient estrangement, which is specific to murder mysteries, not to a mature SF.

2.5. After such delimitations, it is perhaps possible at least to indicate some differentiations within the concept of "cognitiveness" or "cognition." As used here, this term implies not only a reflecting *of* but also *on* reality. It implies a creative approach tending toward a dynamic transformation rather than toward a static mirroring of the author's environment. Such typical SF methodology—from Lucian, More, Rabelais, Cyrano, and Swift to Wells, London, Zamyatin, and writers of the last decades—is a *critical* one, often satirical, combining a belief in the potentialities of reason with methodical doubt in the most significant cases. The kinship of this cognitive critique with the philosophical fundaments of modern science is evident.

3. The World of the Science Fiction Genre (Concept and Some Functions)

3.0. As a full-fledged literary genre, SF has its own repertory of functions, conventions, and devices. Many of them are highly interesting and might prove very revealing for literary history and theory in general. I shall discuss some of these—such as the historically crucial shift of the locus of estrangement from space to time—in the chapters that follow. I shall not, however, attempt a systematic survey of such functions and devices, which would properly be the subject of another book, one that encompassed modern SF as well. I should only like to mention that all the estranging devices in SF are related to the cognition espoused, and that, together with the historical venerability of the genre's tradition, this seems to me a second, methodological reason for according SF much more importance than is usual in academe. However, it might here be possible to sketch some determining parameters of the genre.

3.1. In a typology of literary genres for our cognitive age, one basic parameter would take into account the relationship of the world(s)

each genre presents and the "zero world" of empirically verifiable properties around the author (this being "zero" in the sense of a central reference point in a coordinate system, or of the control group in an experiment). Let us call this empirical world *naturalistic*. In it, and in the corresponding "naturalistic" or "realistic" literature, ethics is in no significant relation to physics. Modern mainstream fiction is forbidden the pathetic fallacy of earthquakes announcing the assassination of rulers or drizzles accompanying the sadness of the heroine. It is the activity of the protagonists, interacting with other, physically equally unprivileged figures, that determines the outcome. However superior technologically or sociologically one side in the conflict may be, any predetermination as to its outcome is felt as an ideological imposition and genological impurity: the basic rule of naturalistic literature is that man's destiny is man.[5] On the contrary, in the non-naturalistic, *metaphysical* literary genres discussed in 2.1 and 2.2, circumstances around the hero are neither passive nor neutral. In the folktale and the fantasy, ethics coincides with (positive or negative) physics, in the tragic myth it compensates the physics, in the "optimistic" myth it supplies the coincidence with a systematic framework.

The world of a work of SF is not a priori intentionally oriented toward its protagonists, either positively or negatively; the protagonists may succeed or fail in their objectives, but nothing in the basic contract with the reader, in the physical laws of their worlds, guarantees either. SF thus shares with the dominant literature of our civilization a mature approach analogous to that of modern science and philosophy, as well as the omnitemporal horizons of such an approach—aspects that will be discussed in the following chapters.

3.2. As a matter of historical record, SF has started from a prescientific or protoscientific approach of debunking satire and naive social critique and moved closer to the increasingly sophisticated natural and human sciences. The natural sciences caught up and surpassed the literary imagination in the nineteenth century; the sciences dealing with human relationships might be argued to have caught up with it in their highest theoretical achievements but have certainly not done so in their alienated social practice. In the twentieth century SF has moved into the sphere of anthropological and cosmological thought, becoming a diagnosis, a warning, a call to understanding and action, and—most important—a mapping of possible alternatives. This historical movement of SF can be envisaged as an enrichment of and shift from a basic direct model to an indirect model. What matters here is that the concept of a science fiction tradition or genre is a logical corollary of the recognition of SF as the literature of cognitive estrangement. It can be gleaned from my approach and examples that I think the literary genre that I am trying to define embraces the subgenres mentioned in 1.1, from Greek and earlier times until today (the Islands of the Blessed, utopias, fabulous voyages, planetary novels, *Staatsromane*, anticipations, and dystopias—as well as the Verne-type *romans scientifiques*, the Wellsian scientific romance variant, and the twentieth-century magazine- and anthology-based SF *sensu stricto*). If the argument of this chapter holds, the inner kinship of these subgenres is stronger than their obvious autonomous, differentiating features. Some historical discussion of these kinships and differences will be attempted later on in this book; here I want only to observe that the significant writers in this line were quite aware of their coherent tradition and explicitly testified to it (the axis Lucian-More-Fabelais–Cyrano-Swift–M. Shelley–Verne–Wells is a main example). Also, certain among the most perspicacious surveyors of aspects of the field, like Ernst Bloch, Lewis Mumford, or Northrop Frye, can be construed as assuming this unity.

3.3. The novelty of such a concept shows most distinctly when one attempts to find a name for the genre as it is here conceived. Ideally this name should clearly set it apart from (1) nonliterature; (2) the empiricist literary mainstream; (3) noncognitive estrangings such as fantasy; and furthermore (4) it should try to add as little as possible to the already prevailing confusion of tongues in this region. The academically most acceptable designation has been that of a literature of *utopian thought*. The concept is no doubt partly relevant but fails to meet the first criterion above; logically, such an approach was usually taught and considered within the scope of either the history of ideas or political and sociological theory. Although I would agree that literature (and especially this genre) is most intimately involved with life—indeed, that the destiny of humanity is its *telos*—I think one should quickly add that literature is also more than an ideational or

sociological document. Since this is the rationale for any systematic literary study and scholarship, I may not need to belabor the point.

The only proper way of searching for a solution seems to require starting from the qualities defining the genre, since this would take care of the criteria 1 to 3 at least. Taking the kindred thesaurus concepts of *science* for cognition, and *fiction* for estrangement, I believe there is a sound reason for calling this whole new genre science fiction *(sensu lato)*.

There are two main objections to such a solution. First, cognition is wider than science; I argued as much myself in 2.5. It is much less weighty, however, if one takes "science" in a sense closer to the German *Wissenschaft*, French *science*, or Russian *nauka*, which include not only natural but also all the cultural or historical sciences and even scholarship (cf. *Literaturwissenscaft, sciences humaines)*. As a matter of fact, that is what science has been taken to stand for in the practice of SF: not only More or Zamyatin, but the writings of Americans such as Asimov, Heinein, Pohl, Dick, etc., would be completely impossible without sociological, psychological, historical, anthropological, and other parallels. Further, an element of convention enters into all names (compare "comparative literature"), but it has proved harmless as long as the name is handy, approximate enough, and above all applied to a clearly defined body of works. The second objection is that the use of "science fiction" confuses the whole genre with the twentieth-century SF from which the name was taken. Given the advantages of the only term at hand fulfilling the above criteria, I would argue that this is at worst a minor drawback; nobody has serious trouble in distinguishing between More's book, the country described in it, and the subgenre of utopia. The trouble begins with the variety of unrelated interdisciplinary and ideological interpretations foisted upon such a term; "science fiction" might perhaps escape the interdisciplinary part of that obstacle race. Furthermore, there are always advantages to acknowledging clearly one's methodological premises. As both Lukacs and Eliot would agree, any tradition is modified and reestablished by a sufficiently significant new development, from whose vantage point it can be reinterpreted. This is, I would maintain, the case with the mentioned *ci-devant* traditions, for example, of "utopian literature," in the age of science fiction. If that is accepted, the new name is no drawback at all, but simply an onomastic consummation.

4. For a Poetics of Science Fiction (Anticipation)

4.1. The above sketch should, no doubt, be supplemented by a sociological analysis of the "inner environment" of SF, exiled since the beginning of the twentieth century into a reservation or ghetto that was protective and is now constrictive, cutting off new developments from healthy competition and the highest critical standards. Such a sociological discussion would enable us to point out the important differences between the highest reaches of the genre, glanced at here in order to define functions and standards of SF, and its debilitating average.[6]

4.2. If the whole above argument is found acceptable, it will be possible to supplement it also by a survey of forms and subgenres. Along with some that recur in an updated form—such as the utopia and fabulous voyage—the anticipation, the superman story, the artificial intelligence story (robots, androids, and so on), time-travel, catastrophe, the meeting with aliens, and others, would have to be analyzed. The various forms and subgenres of SF could then be checked for their relationships to other literary genres, to each other, and to various sciences. For example, the utopias are—whatever else they may be—clearly sociological fictions or social-science fiction, whereas modern SF is analogous to modern polycentric cosmology, uniting time and space in Einsteinian worlds with different but covariant dimensions and time scales. Significant modern SF, with deeper and more lasting sources of enjoyment, also presupposes more complex and wider cognitions: it discusses primarily the political, psychological, and anthropological *use and effect of knowledge, of philosophy of science*, and the becoming of failure of new realities as a result of it. The consistency of extrapolation, precision of analogy, and width of reference in such a cognitive discussion turn into aesthetic factors. (That is why the "scientific novel" discussed in 2.3 is not deemed completely satisfactory—it is aesthetically poor because it is scientifically meager.) Once the elastic criteria of literary structuring have been met, *a cognitive—in most cases strictly scientific—element becomes a measure of aesthetic quality, of the specific pleasure to be sought in SF*. In other words, the cognitive nucleus of the plot codetermines the fictional estrangement itself.

Notes

1. The first version of this essay emerged from a lecture given in spring 1968 in J. M. Holquist's seminar on fantastic literature in the Yale University Department of Slavic Languages and Literatures. I have derived much profit from discussions with him, with Jacques Ehrmann, my UMass colleague David Porter, and my McGill colleagues Irwin and Myrna Gopnik. The final version owes much to Stanislaw Lem's *Fantastyka i futurologia*, which considerably emboldened me in further pursuits within this protean field, even where I differed from some of Lem's emphases and conclusions.

2. A benefit of discussing the seemingly peripheral subject of "science fiction" is that one has to go back to first principles; one cannot really assume them as given. One must ask, for example, what is literature? Usually, when discussing literature one determines what it says (its subject matter) and how it says what it says (the approach to its themes). If we are talking about literature in the sense of significant works possessing certain minimal aesthetic qualities rather than in the sociological sense of everything that gets published at a certain time or in the ideological sense of all the writings on certain themes, this principle can more precisely be formulated as a double question. First epistemologically, what possibility for aesthetic qualities is offered by different thematic fields ("subjects")? The answer given by the aesthetics prevalent at the moment is: an absolutely equal possibility. With this answer is booted out of the field of aesthetics and into the lap of ideologists, who pick it up by our default and proceed to bungle it. Second, historically, how has such a possibility in fact been used? Once one begins with such considerations, one comes quickly up against the rather unclear concept of *realism* (not the prose literary movement in the nineteenth century but a metahistorical stylistic principle), since this genre is often pigeonholed as nonrealistic. I would not object but would heartily welcome such labels if one had first persuasively defined what is "real" and what is "reality." True, this genre raises basic philosophical issues, but it is perhaps not necessary to face them in an initial approach. Therefore, I shall here substitute for "reality" (whose existence independent of any observer or group of observers I do not at all doubt, in fact) the concept of "the author's empirical environment," which seems as immediately clear as any.

3. Viktor Shklovsky, "Iskusstvo kak priem," in *Sborniki po teorii poètich-eskogo iazyka*, 2 (Petrograd, 1917). In the translation "Art as Technique," in Lee T. Lemon and Marion J. Reis, eds. *Russian Formalist Criticism* (Lincoln, Neb., 1965), *ostranenie* is rendered somewhat clumsily as "defamiliarization." See also Victor Erlich's classical survey, *Russian Formalism* (The Hague, 1955).

Bertolt Brecht, "Kleines Organon für das Theater," in his *Gesammelte Werke*, 16 (Frankfurt, 1973), translated in John Willett, ed., *Brecht on Theatre* (New York, 1964). My quotations are from pp. 192 and 196 of this translation, but I have changed Mr. Willet's translation of *Verfremdung* as "alienation" into my "estrangement," since "alienation" evokes incorrect, indeed opposite connotations: estrangement was for Brecht an approach militating directly against social and cognitive alienation. See Ernst Bloch, "*Entgremdung, Verfremdung*: Alienation, Estrangement," in Erika Munk, ed., *Brecht* (New York, 1972).

4. Note the functional difference from the anti-gravity metal in Wells's *First Men in the Moon*, which is an introductory or "plausibility-validating" device and not the be-all of a much richer novel.

5. In such cases as certain novels by Hardy and plays by Ibsen, or some of the more doctrinaire works of the historical school of naturalism, where determinisms strongly stress circumstance at the expense of the main figures' activity, we have, underneath a surface appearance of "naturalism," an approach to tragic myth using a shamefaced validation for an unbelieving age. As contrary to Shakespeare or the romantics, in this case ethics follows physics in a supposedly causal chain (most often through biology). An analogous approach to fairytale is to be found in, say, the mimicry of "naturalism" in which Hollywood happy-end movies engage.

6. A first approach to the sociology of SF may be found in the special issue of Science-Fiction Studies, November 1977, edited and with an introduction by me.