Postmodernism

Stefan Herbrechter

Postmodern-ism, Postmodern-ity, and Postmodern-ization

Like any other "ism," postmodernism is first of all a social discourse that manifests itself in "texts," i.e. all practices and statements that are related to the "postmodern," the "postmodernist," "postmodernism," "postmodernity," and "postmodernization." It is therefore important to distinguish between, on the one hand, what these individual terms refer to, and, on the other, between the different pragmatic attitudes towards them, even though secondary literature might not always be consistent in keeping these apart. This is mainly because postmodernism also functions as the generic term for everything related to the postmodern. But the confusion or ambivalence that reigns within the discussion about postmodernism is also the result of the combination of the linguistic components of the term - "post" + "modernism" itself. One of the characteristics of the prefix "post" is that it renders ambiguous the normal idea of temporal succession and thus the standard notion of history. Post- means of course "after" - postmodernism in this sense is the period or historically locatable style after modernism and is formally distinguishable from the latter. But post- can also be understood as a qualifier of a category, in this case: "modernism" - in this sense, postmodernism would still belong to modernism, or at least to its related terms "modern," or "modernity." In the end the meaning of post- is a question of emphasis: post-modern stresses the temporal idea of something after the modern, whereas *post*-modern stresses the notion that something has happened to the modern so that it is no longer self-evidently "modern." In short, it is a problematization of the modern from "within" its own definitional boundaries, or, in other words, a "deconstruction" of the naturalized meanings of modern, modernity, modernism, and modernization. This, in fact, applies to any "post-ism," which means that every usage of postrequires clarification as to what might be the relationship between the prefix and that which is prefixed. The pragmatic value of post- might be, for example, that of a critique, a repetition, a pluralisation, even an intensification of that which is "posted."

In speaking about the "postmodern" in this way, this essay is already part of "postmodernism" as a theoretical (or "philosophical") and social discourse, as outlined above. It is an example of the kind of "postmodern(ist) theory" that analyzes and submits what is perceived, but also what is often strategically constructed (or "represented"), as a previous philosophical system of thought - grouped under another generic term, namely "modern" or "modernity," which it allegedly and eventually supersedes - to some form of critique. Since there is no agreement about what modernity is or was, neither as a historical period, nor as a social formation, nor as a philosophical system of knowledge, there cannot be just one meaning of the postmodern, postmodernity or postmodernism - there are only postmodernisms.

The relationship between postmodernism and postmodernity is also not clear. If there is synchronicity between the two, then postmodernism is simply the legitimating discourse that either produces or merely reflects (or both) the underlying social, economic, political or indeed scientific and technological changes which constitute the "end of modernity" and the transition to "postmodernity" (i.e. something "other" than modernity, or at least no longer quite recognizable under the name "modernity"). In sociological circles, however, there is absolutely no agreement about whether to refer to the social transformations occurring in the late twentieth or early twenty-first century as "postmodern," "late modern," or "hypermodern," etc. Marxist critics like Fredric Jameson prefer the term "late modern capitalism"; others who, in the Marxist tradition, see changes to the economic base as the main indicator for historical development (economism), even speak of "hypercapitalism," or "the age of global capital." Others, who see technological development as the driving force

behind historical change (technological determinism) speak of the advent of the "(digital) knowledge society," "information society," "network society," or "global media society." Here, as with the emphasis of the post- in general, the question is one of perspective, or, in other words, on stressing continuity or discontinuity between modernity and postmodernity.

The adjective or adjectival noun "postmodern" is also used in a number of ways. Jean-François Lyotard, whose work The Postmodern Condition (1992) arguably is responsible for giving the term postmodern and postmodernism widespread currency in the English-speaking world, uses "postmodern" in a sociological sense as a transition towards a "knowledge society," with knowledge becoming the most precious resource and commodity, which results in what he calls a "legitimation crisis" for traditional "metanarratives" (narrativizations of the kind of belief system that underpins a modern worldview based on the philosophy of the Enlightenment - i.e. liberalism, empiricism, universalism, etc.). On the other hand, in his more philosophical writings and his art criticism, Lyotard also uses the postmodern in opposition to "classic," which means that it might be understood stylistically as a reaction against, for example, the modern canon, academicism, or the institutionalization and commodification of the aesthetic. Finally, in analogy to Kant's, Baudelaire's, and Foucault's understanding of the modern as a "mode," the postmodern could equally be seen, in a transhistorical and transcultural way, as a kind of "attitude" or worldview, seeking an escape from the modern dialectic of progress and nostalgia, and instead opening up the possibility of an entirely "other (than) time" which would not fall into any modern distinction of "new" versus "old."

The most promising reaction towards this irreducible and messy ambivalence is probably not to exclude any of these possible meanings but simply to understand the plurality and uncertainty as the inevitable fall-out of an ongoing process and struggle over the historicization of the present. The most neutral term is therefore "postmodernization," as the

ongoing transformation of modernity into its yet unknown "other," with all the epistemological and ontological shifts, erosions but also confirmations, redrawings and substitutions of boundaries this involves. However, what may best characterize postmodernism as a discourse is that it is somehow focused on the idea of otherness. This derives mainly from its historically problematic relation to modernism, modernity, and the modern as explained above. Due to a certain hermetic structural circularity inscribed into their progressivist and determinist ideology, the modern (and modernity) cannot be "overcome." The modern understands itself as the "latest" development and it therefore always (already) identifies and appropriates the "new" as the latest transformation of modernity. It is governed by an anticipatory and dialectical hermeneutics.

In psychoanalytic terms, the potentially perverse or psychotic effect of this is that modernity on the one hand craves nothing more than the new, but can deal with newness only as that which can be appropriated and integrated as already recognizable. In fact, modernity at once desires *and* fears radical newness. Radical newness is strictly speaking unforeseeable, "risky" in an incalculable sense, or as Derrida would put it, remains "to-come" (*à-venir* understood as radical futurity). If postmodernism is at once the reflection of the contemporary phase of "late modernity" and the announcement of (the coming of a radically other) "postmodernity," it often comes across as the exasperated expression of the interminability of the (eternally) modern. It therefore performs an ongoing critique and a "rewriting" of modernity with an underlying desire for an other (than-the-modern).

In this, the postmodernist critique of modernity coincides with Heidegger's destruction and Derrida's deconstruction of "Western metaphysics" (understood as the tradition of philosophical thinking that privileges an ontology of presence). Since the modern and the metaphysical both include the very principles of their own "overcoming," a simple break or transcendence would be insufficient because any "over-reaching" gesture of this sort would inevitably be re-appropriated as a continuation of modernity and Western metaphysics themselves. Postmodernist theory therefore attempts to erode Western metaphysics from "within," while inscribing itself in marginalized counter-traditions and heterology. It is the trust in the other, or the radically heterological - which must remain ineffable in order to escape its appropriation by Western metaphysical thinking - which might eventually lead to a destabilization of Western cultural imperialism and political universalism.

Otherness or "alterity," according to the *Oxford English Dictionary* (OED), is "the state of being other or different; diversity, 'otherness." In a postmodernist context, alterity contains the ethical imperative of respecting this otherness *as* radical difference. This attitude is what underpins the postmodernist "ethics of alterity" - informed by the work of both Levinas and Derrida - which aims "to locate an otherness within philosophical or logocentric conceptuality and then to deconstruct this conceptuality from that position of alterity" (Critchley 1989: 94-5, and 1992). The other, thus understood in its radically heterological sense, is neither an essence nor a phenomenon; it is "irretrievably plural and cannot be assimilated, digested, represented, or thought as such, and hence put to work by the system of metaphysics" (Gasché 1986: 103). The ethical demand this philosophy of radical heterology presupposes is the inevitable necessity *and* impossibility of doing justice to the (pre-ontological) other as other.

Despite this logical impossibility, because it questions the "discreteness" of the ego, the (pre-) existence of the modern (Cartesian and Enlightenment) subject and the autonomous (liberal, humanist) individual, all of which rely on identification through the reduction of otherness to a paradigm of difference and sameness, an "ethics of alterity" is the only form of ethical thinking available to postmodernism. To experience the exteriority and heterology of the Other can only be achieved through the idea of the infinite which breaks through the

totalitarian aspect of Western metaphysics by questioning the fundamental primacy of the subject, ego or self. The idea of the infinite gives access to the other as a primordial responsibility.

Postmodernism and Literature

Literary postmodernism is first of all a reaction against classical modernism and against its principle of canonization. The modern idea of the canon and its constant revaluation is based on the assumption that a continual renewal and extension of literary experience occurs through a process of canonical "sedimentation." Reception aesthetics, for example, explains the process of canonization according to a dialectic of expectation and appropriation. It is the "aesthetic distance" in relation to the receiver's "horizon of expectation" which, in turn, leads to a negation of and a break with the existing (canonized) literary experience (cf. Jauss 1973: 177 ff). This "change of horizon" is due to a belated understanding of the new which is gradually appropriated and transferred into the classical or canonized literary experience. The historical dimension of a literary work and thus the task for the literary historian lies in the constant process of measuring the horizon of expectation against the change of expectation in time. The diachronic development within the horizon of expectation leads to a synchronic situating of a work in relation to the canon.

The problem with reception aesthetics, one could say, is that it logically denies the possibility of any true reception taking place. It is impossible to determine a horizon of expectation that a "new" literary work could encounter or change, since this horizon is by definition always receding. How a break with an existing horizon can actually occur must therefore remain inexplicable, because it can only be observed *après coup*, after the fact. The canon thus can never be questioned in its organic continuity. The difference or distance the "new" literary

work promises serves only in so far as it affirms a tradition. Its difference is there to be reduced, and its otherness to be appropriated. A text resisting this idea of horizon, or a completely "unexpected" text, would have to remain unreadable and unreceivable. But it is precisely this unreadable text which represents the hope of bringing about a change of horizon. It is the resistance to an aesthetics of reception which makes an unreadable text the most urgent text to be "received." But it can be received only outside the (horizon of the) canon and thus according to an ethics of alterity, which would be an ethics based on a radical idea of the reception of the unclassifiable. It is in following this form of logic that Roland Barthes (1977) called the unclassifiable text (as opposed to the "readerly" or "writerly" text) "receivable."

Strictly speaking, one never really *receives* a text, because one always only *re*-ceives it, one "captures it back/again" (Latin *re-capere*), thus presupposing an object (text), a subject (reader) and a first "capture." To receive the (un)receivable text (in any text) is to receive it as an impossible gift. This is valid for any kind of reading or process of receiving, but in particular it is true for a context that desires itself to be "postmodern(ist)," that is, a discourse that questions the very newness of the new and thus modern. One might argue therefore that to be able to receive postmodernist literature (which is far from being new) and to realize what might be radically other in it *- post*-modern (as belonging to a "postmodernity" to come, in the strict sense) - a different form of reading is needed, namely a reading that is conscious of its belatedness and bypasses the question of originality and the modernist logic of the avant-garde. This means of course reading "outside" of any canon, and ideally even before any canonization sets in - which explains the two main formal characteristics of postmodernist literature and art in general: the frequent use of "pastiche" and the mixing of modern "high" and "low" cultural forms.

Postmodernist literature thus often gives the impression that it is a kind of waiting for an impossible event (the "new" or unexpected other), while writing goes on and endlessly produces fiction, which writes about the (im)possibility of writing the event. There is a kind of performativity and circularity, sometimes even an apocalypticism, which seeks to invoke, conjure up, and express the ineffable. This is also the reason that intertextuality, or the notion of the "intertext," can be seen as one of the central presuppositions of many postmodernist theories. Every text is not only an open system but is also never identical to itself. It is part of a system of textual relations, a form of generalized textuality which alone guarantees the "readability" of our cultural universe. Thus intertextuality is the very condition of perceiving social reality and has thus quasi-ontological status, which explains the proliferation and mise*en-abyme* or potentially infinite self-embedding of narratives about narratives and the fragmentation and loss, the dissemination of identities and texts or fictions in postmodernist writing. In a textual world, intertextuality is the only form of social relation with either the present or the past (history as layers of textuality). In a textual world where every fiction is only another text, metafictionality - fiction that narrates its own fictionality - becomes virtually interchangeable with intertextuality.

In postmodernist fiction, both metafictionality and intertextuality are employed to demonstrate the constructed (fictional) nature of human reality. In so doing, postmodernist metafiction serves an important heuristic purpose in helping to understand contemporary ideas about reality - from the idea of general textuality as a "prisonhouse of language" to "new forms of the fantastic, fabulatory extravaganzas, magic realism (Salman Rushdie, Gabriel García Márquez, Clive Sinclair, Graham Swift, D. M. Thomas, John Irving)" (Waugh 1984: 9). The generalized notion of textuality thus often leads to a celebration of the power of fiction and fictionalization seen as equivalent to a reality- and world-building process. Some of the most frequent framing devices to be found in postmodernist metafiction thus include

stories within stories, characters reading about their own fictional lives, selfconsuming worlds or mutually contradictory situations, Chinese-box structures, which contest the reality of each individual "box" through a nesting of narrators, "fictions of infinity," confusion of ontological levels, through the incorporation of visions, dreams, hallucinatory states and pictorial representations which are finally indistinct from the apparently "real" [thus reaching the conclusion that there] is ultimately no distinction between "framed" and "unframed." There are only levels of form. There is ultimately only content perhaps, but it will never be discovered in a "natural" unframed state.

(Waugh 1984: 31)

Postmodernist metafictional novels usually display a (meta)linguistic awareness and linguistic playfulness. Metafiction draws attention to the process of "recontextualization" that occurs when language is used aesthetically, so that their embraced conception of reality tends towards one of what Waugh calls the two "poles of metafiction" (1984: 53). Either they constitute a "parody" (or rather, the whole world is a parody), or they are predominantly "metafictional at the level of the signifier." One could say that it is the importance attributed to language as the only access to reality which assumes a crucial role in the reception of both postmodernist fiction and theory. In the context of a postmodernist ethics of alterity, it is of course important that this alterity must be articulated in language. The prospective articulation of otherness, and the fundamental possibility for a dialogue with the other, is vital to prevent the foreclosure of otherness and difference. Therefore the underlying assumption is that there must be "something" outside (inter)textuality. Only a problematized notion of referentiality allows at once for the respect of difference, the existence of alterity, and a possibility for an experience of otherness.

Postmodernism and Science

The relationship between postmodernism, science, and technology is highly problematic. Modern science as the product of Enlightenment epistemology is founded on and inextricably bound up with "Western metaphysics" (realism, empiricism). On the other hand, modern science also contains a critique of some fundamental metaphysical principles, such as "God," and a rejection of all forms of "mysticism" (rationalism). It is therefore no surprise that there are both technophile and technophobic aspects in postmodern thought. Historically, the postmodern period coincides with the rise of a new and intensified scientific and technological age, roughly beginning after World War II, with the rise of nuclear technology, the proliferation of the mass media, new forms of telecommunication and, eventually, digitalization. Ideologically, postmodernism as a style and mode of thought often expresses scepticism and even resistance to these technological changes, from the beginnings of environmentalism, the Green and anti-nuclear movements, to digital neo-Luddism.

Nevertheless, as already mentioned, Lyotard's *The Postmodern Condition*, the main philosophical manifesto of postmodernism, is a report on the cultural and political changes within the coming "knowledge (or information) society" and its democratizing potential as far as the redistribution of wealth through the accessibility and circulation of knowledge is concerned. In general, where technological change is connected to communication and its extension to virtually all material and cultural aspects, postmodernism tends to be enthusiastic about its pluralising and networking potential. Wherever technological change means technocracy or the rule of an anonymous techno-scientific capitalist apparatus combined with an ideology of technological determinism, postmodernism tends to foreground its scepticism. This is mainly connected to postmodernism's attitude towards plurality and heterology as explained above.

Postmodern techno-scepticism is mainly concerned with the homogenizing power of technoscientific capitalism and bureaucracy, on the one hand, and, on the other, with their connected "derealizing tendencies" - a stance mainly following the writings of Jean Baudrillard. As opposed to the uniformizing potential of new (communicational) technologies and global technoscientific capitalism, postmodernism generally advocates alternative and subjugated forms of knowledge in line with its fundamental value-pluralism, its privileging of difference over sameness and its openness toward forms of otherness. It opposes the exclusivity of modern, rationalist, instrumental and empiricist criteria for scientificity and seeks allies in what could be labelled "postmodernizing" tendencies within scientific discourse itself.

Underpinning postmodernism is the critique of the modern Enlightenment tradition, with its underlying rationalism, universalism, and liberalism, a critique to a certain extent also taken up within the philosophy of science itself. Works like Kuhn's *The Structure of Scientific Revolutions* (1962), or Paul Feyerabend's *Against Method* (1979) contributed to an opening up of science towards questions usually asked by the social sciences and the humanities, where science is treated as a historically and culturally specific "practice," and the relationship between science, politics, and economics and their influence on the "production" of knowledge is investigated, and the role of cultural prejudice in scientific institutions is criticized. Other aspects include the representation of science, scientists, and scientific institutions in society, and, generally, the social or cultural "constructedness" of scientific knowledge.

These questions became the starting point for the institutionalization of the so-called (postmodern or critical) science studies, or cultural studies of science, which ultimately

provoked the infamous "science wars" and the related "Sokal affair." Alan Sokal placed in *Social Text* an apparently self-evidently "nonsensical" parody article on the alleged postmodern exposure by quantum physics of the constructedness of "gravity," and this can certainly be seen as proof of the fashionable and unreflected character of some postmodernist jargon. On the other hand, however, it can also serve to indicate that a new dialogue between certain quarters of the sciences and especially the "new" and digital sciences (bio-, info-, cogno- and nanoscience for example) and the "new" (digital theoretical and cultural) humanities is all the more desirable.

In general, what might best characterize the coincidence of socio-cultural postmodernization and scientific-technological change in the late twentieth and early twenty-first century, is the effect of a new permeability between science and culture - a certain "culturalization" of science as a practice combined with an increased "presence" of science within culture - which can also be seen in the rise of a genre like "science fiction." It is indeed the blurring of the boundary between fact and fiction that erodes modern rationalist scientificity and at the same time allows science to become arguably the most important source of cultural change (as in the notion of "technoculture"). Usually, certain shifts within the sciences, namely towards emphasizing notions like entropy, relativity, complexity and chaos, are seen as signs of science's own postmoderization. Chaos theory, quantum mechanics, artificial intelligence or self-organization (emergence) and systems theory have thus become areas in which analogies between the sciences and the humanities have been strongest.

Postmodern - Science - Fiction

Given the mentioned blurring of the boundaries between culture, science and technology which is very much a logical consequence of the blurring of "high" and "low," elite and mass culture in postmodernism - it is in many ways science fiction which can act as a "symptom" of technocultural postmodernization. As the editor of *Liquid Metal* explains, "contemporary science fiction is immersed in the symbols, signs and polymorphous impressions of postmodernity and postmodernism. . . . The sense of a postmodern world in a state of flux is replayed again and again in contemporary science fiction" (Redmond 2004: 218). In addition, the blurring of any clear boundaries between science, fiction, and postmodernism cuts both ways, so that, as Andrew Butler explains, "much postmodernism reads like sf" (Redmond 2004: 137).

As in postmodernist writing in general, so also in science fiction in particular, metafictionality, or the awareness of a text's own fictionality or the impossibility of a clearcut distinction between fact and fiction ("faction") becomes a main aspect of contemporary science fiction. In terms of science fiction, Lyotard's postmodern "incredulity towards metanarratives" involves an ambivalent playfulness towards science and technology. In addition, "if postmodernism [following Fredric Jameson] functions according to or even is the logic of late capitalism, then this places cyberpunk as central to the understanding of the period" (Butler 2004: 141). The underlying technoscepticism of cyberpunk exposes scientific reality as a simulacrum or a special kind of fiction, which nevertheless has "real" (social, economic, political) effects. This explains the prevalence of "schizophrenic" denegation, cynicism, and pastiche, for example, in novels like William Gibson's Neuromancer (1984), films like Ridley Scott's Blade Runner (1982), and the writings of Philip K. Dick and J. G.Ballard. Science fiction in fact runs parallel to and in some instances even anticipates postmodern theory (cf. Baudrillard's use of science fiction and theory), mainly because literary science fiction itself can be understood as a reaction against "high modernism." Brian McHale even uses science fiction as the paradigmatic postmodern literary genre which is

"openly and avowedly ontological . . . 'world-building' fiction, laying bare the process of fictional world-making itself" (McHale 1992: 12).

Science fiction has turned "ontological" not just in aesthetic literary terms. In reaching a wide audience thanks to film, science fiction has entered postmodern every-day life experience with its ubiquitous references to aliens, space, teleportation, cyborgization, simulation and virtualisation, which has created a kind of sci-fi cultural imaginary, also fuelled by the invasion and ubiquity of high-tech appliances in everyday cultural practice. It is, according to Jonathan Benison, precisely as a "mode rather than as a genre that SF speaks to postmodernity," whereby science fiction "emerges through social theory as one way of talking about certain recent developments in advanced industrial society" (1992: 139). In this sense, SF is a cultural "symptom" of late capitalism, an oblique representation of Jameson's understanding of postmodernism as "logic of late capitalism." It is thus possible to analyze science fiction in the light of postmodernist style and technique (metafictionality, selfreferentiality, pastiche etc.), but at the same time it is also a reflection of "social postmodernization" (Benison 1992: 141).

SF as the fictional construction of a simulated world loses its formerly didactic utopian/dystopian intention and instead is accepted as a kind of new (hyper)realism connected with the role of science and technology and as a way of working-through the unconscious desires and anxieties of late capitalist technoscientific society. The main coincidence between postmodernist theory and science fiction lies in a common interest or "specialization" in encountering the other, with all its intended or unintended psychotic-paranoid, ambivalent, derealizing and reversing side-effects. Undermining the ontological foundations of the "real" world as only one of many "possible" worlds leads to a general fictionalization that can be experienced as both liberating and terrifying. Postmodernism and science fiction play with both freedom and terror: the impression of, on the one hand, increasing control over the world, and, on the other, the world's utter unknowability, a sense of absolute loss of control over both self and world. Through its generalization within the contemporary Western imaginary, science fiction as a separate identifiable literary or filmic genre has ceased to exist as such, but "survives" as arguably the central driving force in contemporary fantasy, fictionality and simulation in cultural practice.

In conclusion, it may be said that postmodernism as a discourse concerned with the social transformation taking place in the second half of the twentieth and the beginning of the twenty-first century is unthinkable without taking into consideration the fundamental transition from an industrial to a post-industrial society, and from a nuclear-energy to a digital-information technology base. On the other hand, postmodernism as formal style and mode of thinking may very well have some lasting effect on the way in which science is perceived and the way it perceives itself, even if this is not (yet) always admitted or admissible in "serious" scientific circles.

References

- Barth, J. (1982) *The Literature of Exhaustion and the Literature of Replenishment*, Northridge, Ca.: Lord John Press.
- Barthes, R. (1977) Roland Barthes, trans. R. Howard, London: Macmillan.
- Baudrillard, J. (1994) Simulacra and Simulation, trans. S. F. Glaser, Ann Arbor: University of Michigan Press.
- Benison, J. (1992) "Science fiction and postmodernity," in F. Barker, P. Hulme, and M.
 Iversen (eds) *Postmodernism and the Re-Reading of Modernity*, Manchester:
 Manchester University Press, pp.138-58.

Bertens, H. (1995) The Idea of the Postmodern: a history, London: Routledge.

- Best, S., and D. Kellner (2001) *The Postmodern Adventure: science, technology, and cultural studies at the third millennium*, London: Routledge.
- Butler, A. M. (2004) "Postmodernism and science fiction," in E. James and F. Mendesohn (eds) *The Cambridge Companion to Science Fiction*, Cambridge: Cambridge University Press, pp. 137-48.
- Critchley, S. (1989) "The chiasmus: Levinas, Derrida and the ethical demand for deconstruction," *Textual Practice* 3(1): 91-106.

-- (1992) The Ethics of Deconstruction: Derrida and Levinas. Oxford: Blackwell.

- Deleuze, G., and Guattari, F. (1987) *A Thousand Plateaus: capitalism and schizophrenia* 2, trans. B. Massumi, Minneapolis: University of Minnesota Press.
- Derrida, J. (1987) *The Post Card: from Socrates to Freud and beyond*, trans. A. Bass, Chicago: University of Chicago Press.
- -- (1994) Specters of Marx: the state of the debt, the work of mourning, and the new *international*, trans. P. Kamuf, intro. B. Magnus and S. Cullenberg, New York and London: Routledge.
- Ermarth, E. D. (1992) Sequel to History: postmodernism and the crisis of representational time, Princeton: Princeton University Press.
- Feyerabend, P. (1979) *Against Method: outline of an anarchistic theory of knowledge*, London: Verso.
- Gasché, R. (1986) *The Tain of the Mirror: Derrida and the philosophy of reflection*, Cambridge: Harvard University Press.
- Hayles, N. K. (ed.) (1991) Chaos and Order: complex dynamics in literature and science, Chicago: University of Chicago Press.
- Heise, U. K. (2004) "Science, technology, and postmodernism," in S. Connor (ed.) The Cambridge Companion to Postmodernism, Cambridge: Cambridge University Press,

pp. 136-67.

- Hutcheon, L. (1988) A Poetics of Postmodernism: history, theory, fiction, London: Routledge.
- Jameson, F. (1991) Postmodernism, or, the cultural logic of late capitalism, London: Verso.

Jauss, H. R. (1973) Literaturgeschichte als Provokation, Frankfurt am Main: Suhrkamp.

- Kuberski, P. (1994) *Chaosmos: literature, science, and theory*, Albany: State University of New York Press.
- Kuhn, T. S. (1962) *The Structure of Scientific Revolutions*, Chicago: University of Chicago Press.
- Levinas, E. (1982) En Découvrant l'existence avec Husserl et Heidegger, Paris: Vrin.
- Lyotard, J.-F. (1991) *The Inhuman: reflections on time*, trans. G. Bennington and R. Bowlby, Cambridge: Polity Press.
- -- (1992) The Postmodern Explained to Children: correspondence 1982-1985, trans. and ed.J. Pefanis and M. Thomas, London: Turnaround.
- -- (1994) *The Postmodern Condition: a report on knowledge*, trans. G. Bennington and B. Massumi, Manchester: Manchester University Press.
- McHale, B. (1992) Constructing Postmodernism, New York and London: Routledge.
- -- (1987) Postmodernist Fiction, New York and London: Methuen.
- Redmond, S. (ed.) (2004) *Liquid Metal: the science fiction film reader*, London: Wallflower Press.
- Rose, M. A. (1991) *The Post-Modern and the Post-Industrial: a critical analysis*, Cambridge: Cambridge University Press.
- Waugh, P. (1984) *Metafiction: the theory and practice of self-conscious fiction*, London: Methuen.