

## SF Parables of Mutation and Cloning as/and Cognition (2002)

### o. Introduction

#### *o.I. Thesis*

It has been rightly observed that biological notions function in SF literature centrally as “metaphors applicable to social relationships ...” (Stableford 124). If so, then their development into an SF narrative constitutes in most significant cases a *parable* (of a classical or a new type, to be determined inductively). In other words, the use of themes based on evolution and biotechnology – including genetic manipulation, cloning, and other biological or medical innovations – does not function in SF as any straightforward extrapolation seriously developing scientific horizons. I have argued at length elsewhere that scientific extrapolation is not and cannot be the function of SF as fiction. Rather, in all significant cases these themes centrally function as vehicles for a sociopolitical tenor, for developing analogies to possibilities of relationships between people in the author’s present. In this context, no doubt, what happens to the uses of (say) mutation or cloning in a rich web of life-world relationships may well supply precious insights about the pros and cons of a given societal experiment, so that SF can alert the public sphere to possibilities latent in technoscience under capitalism.

I shall use an introductory framework to sketch in briefly the chronology of biological themes in SF, continue by induction from “exhibits” of selected examples, and conclude with some pointers to the function and forms of cognition and experimental method in SF and on how that compares to scientific discourse and to parable.

0.2. *Survey of Biological Themes*

If biology = life sciences (based on the cell), then we might call “biological SF” all SF centrally dealing with radical change in the protein or analogous frameworks for living beings. It logically focused first on both ends of life – different creation of living being and immortality – but later on the implications of the whole. This extends to showing non-human life, which is, if not a gratuitous but mindless thrill (plot gimmick), used either as awful warning to us humans (Mary Shelley) or as intriguing, perhaps positive, possibilities (Weinbaum), often as both (Lem). Also, I shall be arguing that the actual scientific theme used – mutation, cloning, gene manipulation or similar – is subordinated to its analogical function in the narration.

Early thematic nuclei are:

- *Exotic living (beings)*:
  - (a) Beings and modes of living found on, later arriving from, other planets beginning with the Moon stories of Kepler and Cyrano, satirized already in Swift’s horrible immortals that refunction a classical myth (Tithonus). This possibly culminates in Camille Flammarion and Rosny Aîné (nineteenth-century France), and then in Stanley Weinbaum’s “A Martian Odyssey,” “The Valley of Dreams,” “The Mad Moon,” “Parasite Planet,” “The Lotus Eaters” (written ca. 1933–35).
  - (b) Fabricated by early science, rather than magic à la the Golem, culminates in Shelley’s *Frankenstein*.
- *Evolution*, following upon Darwin and T.H. Huxley. Of first importance, it can be argued it gave birth to modern SF thru Wells. It is overt in *The Island of Dr. Moreau*, but his whole early great cycle of dystopian SF from *The Time Machine* to *First Men in the Moon* is properly sociobiological, and interesting in proportion to his strange melding of Social Darwinism with Fabian socialism in the guise of “black” evolutionary biology. When the meld begins to fly apart, as already in *The Invisible Man* and *Food of the Gods*, his significance falters. A popular if misguided offshoot of Darwinism was eugenics, which was always, down to John Brunner’s critique in *Stand on*

*Zanzibar*, deeply enmeshed with bourgeois racism, the fear of losing the ruling-class living standard to the pressure of the poor.

- *Mutation and somatic manipulation*: Mutation was at first, following upon the Mendelians in early C20 (de Vries), taken as spontaneous; then as manipulation, that is, conscious human intervention into heredity – which later begins to be metaphorized as engineering – present already in Dr. Moreau and Stapledon's *Last and First Men* but in an early, "either crude or very vague" (Stableford 123), form. Especially after H.J. Muller's 1927 induction of mutations in fruit flies by irradiation, this grew very popular in early SF; however, it was as a rule used as metaphor and as a magical but pseudo-scientific justification either for superman (Stapledon, *Odd John*; G.B. Shaw's late plays) or for action thrillers in the often racist "mutagenic romances" of Taine and others. A much better use is to be found in Stapledon's *Sirius* (1944) where the mutated superdog serves as a parable of the lonely intellectual, an angelic answer to Wells's *The Invisible Man*; an awful warning bordering on horror is Julian Huxley's "The Tissue-Culture King."

There is a thin dividing line between controlled mutation and somatic manipulation (radical manipulation of embryo cells), following upon experiments in artificial fertilization and steering of cell-division; yet the distinction is important, not least because the affects accompanying intervention into a single cell as opposed to a fetus or incubated infant are different, as can be seen in present-day debates. Somatic manipulation could be considered as a both scientific and imaginative prelude to present-day gene manipulation. Its public impact culminates in Aldous Huxley's *Brave New World* (1932, forty-two years before the first announcement of real-life "test-tube babies," but eight years after Haldane's *Daedalus* that announced them). While the sterile opposition between a scientific dictatorship and a romantic individual vitiates Huxley's horizons, his novel's startling insights remain the foil to much later SF down to Mitchison and to Cherryh's *Cyteen* Trilogy. A more thorough and serious use of germ-cell manipulation culminates in James Blish's "adapted men" or Pantropy cycle in *The Seedling Stars* (1952–56), whose splendid anti-racist sting in the tail is very important in a tradition that has since Wells's *War of the Worlds* had its plentiful share of alien-bashing (BEM) racism – for example, in the shameful novel and movie *Starship Troopers*.

Today all these thematic stages and forms are important for the present discussion as the tradition behind, and bases of investigation into, what is certainly the most important development in biology since Darwin:

- *Technoscientific gene manipulation*, following upon the 1953 Crick-Watson identification of the structure of the DNA molecule and on the experiments in cloning from the early 1960s on, which was to lead to other developments in manipulation of heredity under the aegis of a ruthless pursuit of power and profit. Beginning with some uses of mutation, I shall go on with cloning as my focus, while at times drawing parallels to similar biological themes. My discussion will therefore slight the instances technically considered as a clone – group of individuals asexually replicated from the same individual – but not produced by aimed technoscientific manipulation (e.g., in spontaneous parthenogenesis as in many feminist works, or as result of time-travel or matter duplication in action thrillers à la van Vogt).

### Exhibit 1. Utopian Communism and Humanist Mentalism: Mutations of Last and First Men (1930)

I shall use what one could, in Stapledon's running metaphor from music, call the "biological movement" sandwiched between the sociopolitical and the cosmic movements of *Last and First Men* (further LFM), and consisting of chapters VII to XII/2, (pp. 132–243 in the Penguin 1963 ed.; citations will be to subchapter rather than page). It begins with the Second Men who appear as result of "an epidemic of biological variations," which brings a much improved physiological organization and maturity at age 50, but most importantly a transformed mind. This centrally meant an extension of delight from erotics to an "appreciation of the unique physical and mental forms of all kinds of live things," or "altruism as a passion," tempering the "competitive self-assertion" of the First Men which "cursed the earlier species [that is, *Homo Sapiens*] with industrialism and militarism." Passion and energy are invested only in a "vision of a worldwide community of persons" and one's function in it, and concomitantly

in “the higher kinds of mental activity” and their subtle objects – philosophy, mathematics, and above all music (VII/1).

This is confirmed in the crisis befalling the Second Men due to their brain outgrowing their cranium and circulatory system. It is again resolved by a *deus ex machina* appearance (presumably through mutation) of a new, “more stable variety,” a “roomier-skulled and stronger-hearted type,” which fortunately “proved to be a dominant Mendelian character” (VII/2). In an almost embarrassingly blatant way, this is a parable for the need of head and heart to be redone if the new type of human relationships is to flourish. After an interlude of Dark Times due to the virus of a mysterious fatigue, the third civilization of the Second Men (this time not due to mutation) rose to a culmination enabled by scientific advances that secured more energy from the environment for the species, by the gift of mutual sympathy, and by their combination of a practical commonsense that was more than British, with a more than Russian immunity from the glamour of wealth, and a passion for the life of the mind that even Greece had never known.

My hypothesis is that at least the Second Men, and in all probability the whole central “biological” movement of the LFM symphony, is based on Stapledon’s revulsion against the bourgeois civilization that culminated in World War I and a debate with what seemed evident successes of the original Soviet experiment in the 1920s. The “Russian” in the above passage applies in my judgment to a Stapledonian interpretation of Leninism as a populism of the Tolstoy and Dostoevsky kind, where it is obvious its high-flown demands need corrections from the “British commonsense” as well as a final yoking to the Hellenic “life of the mind,” again a curiously pre-Nietzschean picture of Greeks as Apollonian philosophers. Still, I propose that the Second Men clearly figure forth a kind of *utopian communism* based on a combination of idealist (rather than materialist) philosophy with what one may call a “physiological materialism,” the belief that human nature has – literally – to be radically changed in order to achieve such a life. All these ideologemes were, of course, current on the British Left in the first post-war period. And the two prongs of mentalism and materialism could be combined in a Lamarckian rather than Darwinian way, by having, for example, “spiritual disaster ... take effect upon germ-plasm” (IX/3).

The theme of the individual's function within community recurs in the conflict between the Martian group-mind cloudlets and the Second Men. The Martian vibratory droplets, probably (together with Rosny) the first real Aliens of SF – they have “prejudices very unlike those of man” – are a cross “between an extremely well-disciplined army of specialized units, and a body possessed of one mind” (VIII/2). Their “sameness to one another” entails the lack of love and spiritual knowledge, and centrally of the knowledge “what should constitute individuality, and its advancement” (VIII/3). Being fluid, they worship rigidity: the attack on Earth is a crusade to liberate diamonds as well as to capture water for their arid planet! However, during the protracted war a conflict develops between the more realistic “colonial” cloudlets on Earth and the centralized militaristic “Leviathan” back on Mars which must repeatedly wipe them out. Finally the Martians are all destroyed by bacteriological warfare, even though this also wipes out the civilization of the Second Men (IX). I shall forego the obvious parallels from medieval history, Wells, and World War I, and remark only that the anti-State stance is here very similar to Zamyatin's melding the bourgeois state of World War I, capitalist industrial armies, and Soviet “War Communism” as the target of his dystopia *We* at the same period. This stance can serve to measure the distance between Stapledon's utopian and Lenin's militant communism. A good part of that distance is constituted by the wholly atheistic but very strongly religious streak of LFM, evident also in the fact that the inter-Martian conflict is conducted in terms of the “colonial” heresy favoring more life of the mind as against the home-planet orthodoxy of radiation. Having won the war, the Third Men, themselves reborn through a series of mutations, learn to manipulate the fetus and, later, hereditary germ-plasm. After a series of breakdowns, and with help of a Fourth Men species of Great Brains, the Fifth Men are totally redesigned, including “the incorporation of Martian units in the new model of germ cell.” Only then can passions be affirmed while socially controlled, the self be regarded “chiefly as a social and intellectual being,” and a balance struck between “the organized community of all minds” and “love of individual spirits of every kind” (XI/3) under the aegis of art and religion.

My conclusion is: first, Stapledon is writing a co-ordinated series of parables. They differ from the usual ones, that need a dogma to lean on

and work for, by his improvising a creed of his own, which for the “biological movement” of LFM I called utopian communism but for the horizons of the book as a whole could be called a kind of *humanist and cosmic mentalism*. Second, for this tenor the vehicle of mutation is convenient but not decisive, so that it can be dispensed with at will. This is the case, for example, of the third civilization of Second Men and of the intelligent monkeys (apparently evolved without mutation) that for a time endanger the first variety of the Second Men (VII/2). The signifier or vehicle of mutation is wholly subordinate to the signified, the author’s wished-for tenor: utopian communism without wars or industrialism. Just as in the Parables of the Kingdom (Matthew 13) it is secondary whether the vehicle is a mustard seed, good earth furthering the seed, or eradicating an enemy’s tares in one’s field, so here it could be a mutation, a slow biological evolution without mutation, or simply social changes and/or a change of heart within given conditions. However, in LFM some biological mechanism is necessary to validate the physiological change that is consubstantial to the new mentality. This work could have been written without Mendel, but it could not have been written before Darwin and Wells.

## Exhibit 2. Clones as Metaphors for Identity: “Nine Lives” and “The Fifth Head of Cerberus” (1969, 1972)

At the end of Stapledon’s Fifth Men they accede to telepathic communication, which enriches diversity rather than suppressing it in favor of one group mind. I must confess that if we are to take telepathy as a serious blueprint, accession to it after four more species and untold civilizations through millions of years seems to me more realistic. But in our straits, much more dire than the 1920s, we cannot be so patient and the theme of telepathy – or intuitive sympathy, technically without telepathy – is activated as a parable for being fully and continuously members of one another, for good or ill a unanimous collective.

An early classic, Le Guin’s story “Nine Lives,” manages to suggest in a small compass an equally cosmic metaphor, which however has lost

Stapledon's endangered yet still vibrant utopian optimism. As usual in Le Guin, the landscape both determines and explains the foregrounded human relationships that focus on a "ten-clone," which is up to a fatal accident "sufficient to itself physically, sexually, emotionally, intellectually" (140). But nine of the clone's members are killed by quakes when mining on the planet Libra, which is not only seismically "librating," unsettled and unsettling, but also insistently evoked as a diseased and rotten Beast, indeed a Hell into which the mine is a deadly entrance. The destruction of the clone entity is overtly interpreted as an exemplum that a biologically based (but possibly any) community cannot provide escape from the loneliness of people, for only stars can be "a clone of splendors" (132). It is merely possible to hold out an all-important hand of personal helpfulness across this dark gulf of mutual strangers, overcoming fear. In this furthest reach of individualist humanism, any attempt at a Stapledonian fertile balance between personality and overriding community turns out to be cosmically doomed, and furthermore ethically suspect. For Le Guin, it is OK to have a cloned lung because that can be absorbed into an individual, but identity with others equals death. The nine lives of the title are thus those who went the barren and deadly way; the survivor can be redeemed by learning that togetherness may embrace otherness.

I have doubts about the somewhat forced cosmic analogizing at work here, but none about the indispensable socialist theme of solidarity that emerges, albeit tortuously, as its upshot. This will be spelled out in the immediately following, splendid *Left Hand of Darkness*, which I suppose centrally reposes on a thermodynamic metaphor of slowing down, analogized from the climate of the planet Winter to slower societal dynamics (a semi-feudal state) and a limit to sexual tension (androgyny). I'm sorry that androgyny – another biological theme – was soon afterwards ideologically banned by feminism, so that it vanished from sight before its notional and narrative articulation had been sufficiently unfolded to judge what insights lay in it. To judge from this novel, quite a few.

Cloning was also used as a metaphor for personal identity in Wolfe's "The Fifth Head of Cerberus." This equally excellent and oddly affecting story is not only fatalistic but also deeply conservative, for the upshot of our narrator's killing his "clone-father" is that he fills his place: there is no

real possibility of father-killing in the sense of radical break with a hated life-style. This is of a piece with the curious society, a comfortable mix of feudalism, slavery, and capitalism (such as reality had seen without any comfort in Nazism), in which identity – even species identity – may be dubious but the social roles are clear and immutable. In grotesquely inflated and precious ways, both aspects will recur in Wolfe’s later long series of science-fantasy novels.

These two stories may clarify the important distinction touched upon in Section 1: is the biological vehicle for the parabolic tenor indispensable or not? Here: does cloning contribute to discussing individualist identity in ways not possible without it? To my mind Wolfe’s story, where the clone is paradoxically always already a lone individual, could without much problem be situated in a Gothic version of the Old South (even the presumed planetary aborigines come out of Faulkner’s speculation about the Blacks’ effect on White psyches). To the contrary, I don’t see how a mine accident in a Zolaesque or even Faulknerian story could carry the sense of cosmic doom and personal earthquake as in Le Guin. If this is correct, important consequences follow. Where an SF story is a simple transposition, however well written, of a “mainstream” thriller, a Western, a Gothic story or similar, its use of a supposedly SF – here biological – theme is not compelling. While the non-compelling parables such as Wolfe’s may or may not have other virtues as Science Fantasy (or perhaps simply as Post-Modern narration), I cannot see that much cognitive gain ensues from their jury-rigged estrangement.

### Exhibit 3: Cloning – Three Stances Toward Cognition (1975–1976)

I shall try to expand my Exhibit 2 into a more encompassing consideration of what seems a central parameter: *how does an SF narrative treat its thematic nucleus*. The question is not whether the narrative avoids presuppositions or ideological positions toward the theme at hand and

underlying metaphor, for such avoidance is humanly impossible – it would mean forgetting the whole culture in which the author and ideal reader are steeped. Rather, the polar possibilities are whether the narrative sticks to a single possibility or a single dilemma not modified by the narrative feedback (which constitutes the properly cognitive element of storytelling), or whether it opens its theme up for narrative discussion, loyally following where its interaction with our life-world may logically lead even if the results were not foreseen at the story's outset.

A case in point is measuring the distance to dogmatic individualism in three almost exactly contemporary novels about clones by Kate Wilhelm, Pamela Sargent, and Naomi Mitchison. I find in them, and other similar ones, three possible stances. First, the Frankenstein Monster stance, here focusing on the loss of individuality, which is crypto-religious and conservative. Second, the cognitive exploration of possible outcomes, including the pros and cons of the parabolic tenor aimed at. If the outcome is negative, this last, mature stance may result in an awful warning but that doesn't come about because of an *a priori* lack of confidence in humanity but because of a concrete historical analysis. It should be noted that the positive outcome is by now (as different from the technocratic days of Asimov and Co.) not caused by factors inherent to natural science but to sociopolitical understanding. Third and finally, one should note the gimmicky stance, which uses cloning as a peg on which to hang thrilling space-opera plots but has little or no metaphoric or analogical significance. It may be of much ideological and sociological relevance – there were, for example, at least two SF novels about the cloning of J.F. Kennedy after his assassination – but is of no interest here.

In Wilhelm's *Where Late the Sweet Birds Sang* (1976) the clones develop in a post-holocaust situation where the loss of imaginative powers that flows out of their sameness leads to destruction of their community. Only a very few individualist misfits with imagination, who leave the community, survive. Subtending and determining the whole narration is a dubious equation between genetic plus photographic similarity and mental monolithism, or between genetic and imaginative sterility. If one rightly doubts this ideologeme, there remains a story of rugged backwoods individualism succeeding where the mass fails, for which one didn't have

to bother with SF; and the awful warning against massification and uniformity. On the other pole is the proceeding of Sargent's *Cloned Lives* (also 1976) which has a good grasp of the central fact that clones are determined both by nature and nurture and that biological research is potentially a threat "far greater than that of atomic weapons" (17). However, while this novel is clearly superior to clichetized SF, it today reads as shaped by a naive post-60s optimism about politics, both in the USA and in science as an institution. What remains are inquiries into the psychological state of the donor and his five clones against a philistine background and in a tone of everyday realism, largely as a campus novel.

A much fuller development of the central dilemma how to live in a radically new way is Mitchison's *Solution Three* (1975). Mitchison's time scheme is about 120 years in the future, a quarter century after stabilizing a recovery from "the terrible crisis of Aggression" (7), a series of race and national wars that had destroyed large parts of Earth's surface and endangered food production. Due to the examples of two culture heroes called reverentially Her and Him – a White female and a Black male – a strict population limit and living-space allocation in the new mega-cities, plant breeding, and educational policies limiting aggression were enforced by a world Council founded by Her. It is a measure of Mitchison's maturity that this is neither a black nor a rosy future, but a "critical utopia" influenced by feminism (almost all the principal characters in the richly polyphonic narration are female) but poles apart from sectarian separatism. The Council has a Code – epistemological and ethical methodology – that spurns all forms of aggression, though it is able to use limited violence for dire necessities such as local throwbacks to murderous tyranny and exploitation. But the actual policies are flexible, having gone since the holocaust through three "solutions," of which the present Solution Three is a deep-going norm of homosexuality, gay and lesbian, as the only way of keeping population down and – supposedly – fostering non-aggressive love. Heterosexual deviants from the necessary Professorial class (intellectuals) are permitted but socially spurned. Population control includes prominently three generations of clones from the heroic Him and Her (gestated by surrogate mothers, Clone Mums) who are now coming of age and beginning to influence society.

The civilized, indeed sweet-tempered tone of Mitchison's novel, which recognizes and honors genuine attraction and genuine pain on both sides of the sexuality and maternity dilemmas working themselves out in the lives of the protagonists, is carried by a scientific analogy and metaphoric system. A central axis of the novel is the parallel between plant and human genes, which Mitchison rightly understands as being in constant temporal interaction with their ecological system (rather than going for the fashionable – and patentable – atomistic determinism of “molecular genetics”). The dominant grain, fruit, and flower hybrids are threatening to degenerate and must be reinvigorated by wild strains, while some human clones too experience loneliness and begin having “deviant” heterosexual feelings, probably under the influence of maternal cell-materials. This leads the Council to recognize, at the happy ending, that all diversity of life should be fostered: “There are so many kinds of happiness. According to the genes.” (142) The novel ends with a prospect on introducing a Solution Four, rendered possible by the easing of emergency: a coexistence of homo- and heterosexuality, clones and fertile people, stability and deviance, Darwinism and Lamarckism. Life needs Clones and Mums, grain and roses, children and fruit.

All three of these novels arise out of the peace and countercultural movement 1961–73 in the world. Wilhelm's narration may be considered as a conservative reaction to its mass forms, overdetermined by distaste against US mass conformity, and Sargent's as an application to youth psychology. The position of Solution Three may be suggested by the fact that, while focused on a central “mega-city,” it deals also with backlashes on the political and botanical periphery of the world (Mongolia and Latin America), while in Wilhelm the world outside the USA does not exist and in Sargent it is dimly mentioned on the margins (India). This is not simply a matter of geographic parochialism, as adumbrated above in the discussion of Wolfe's vs. Le Guin's landscapes, or of Mitchison's being a Scottish socialist (and at some point, counsellor of a Namibian tribe). It is a matter of imperial navel-gazing, well represented by Heinlein's assumption that the 1776 bourgeois war of settler separation must be the pattern for all future revolutions, even if George Washington is going to be a computer (in his *The Moon ...*), as opposed to a less arrogant stance that takes into account the

real economic and cultural differences and needs of various global areas. The relevance to the present-day wrong globalization, enforced through the hunger-breeding terror of the International Monetary Fund and the killings of US/NATO armed forces and their proxies, and now breeding equally wrong counter-terror, should be clear.

The utopian impulse, and optimism, and clear-eyed mastery of Mitchison's novel results in an impressive masterpiece of modern SF as a critical utopia, worthy of comparison with Le Guin's *The Dispossessed* as mature summations of the 1945–73 Welfare State and anti-fascist epoch. It is in some key notions a not uncritical follow-up to her brother J.B.S. Haldane's *Daedalus* and a counter-project to the blackly sardonic appropriation of his notions in Huxley's *Brave New World* (probably including a use of Huxley's self-critical second thoughts in *Brave New World Revisited* [1958]). Haldane's uneasy flirtation with elite eugenics had already concluded that a society of supposedly perfect people would fail, for the most perfect trait "among plants, animals, and most certainly man was variety" (Kevles 147), though he remained committed to its central tenet of selecting privileged ancestors for the future (cf. *ibid.* 123ff. and *passim*, Ferreira 3–5 and 9). Huxley's positions are ingeniously everted, for example, in the flexible Black woman head of the Council or in the privileged clone nurseries (cf. Ferreira 19–20). *Solution Three* shares the radiance and wealth of ideas of Mitchison's earlier *Memoirs of a Spacewoman*, also informed by biological speculations, and has to my mind been unjustly downgraded in comparison to it. Significantly, one matter totally banned in *Solution Three* is so-called genetic engineering; the multi-talented Mitchison was among other things a cattle-breeder ...<sup>1</sup>

1 "So-called" genetic engineering, since this is a PR label created by billions of dollars, and we better call it gene manipulation or indeed gene bricolage. The failure rate in implanting animal embryos is 98% (cf. Burley ed. 14–18 and Pastourmatzi 169 and 182). Its greatest success so far, the arthritic sheep Dolly, was "successful" at the 278th attempt. What kind of engineering would it be which managed to build a railway bridge at its 278th attempt? My thanks for stimulating this chapter by an invitation to be guest scholar at the Thessaloniki October 2001 conference on Biotechnology and SF go to Domna Pastourmatzi, for great help with materials to John Clute, David Langford, and Susan Squier, and for sending me her then unpublished paper to Maria Aline Ferreira.

In terms of my Section 2, cloning is not cognitively indispensable in Wilhelm but used for Frankensteinian warning; it is of interest but limited necessity in Sargent's delicate naturalism; anchored to the additional plant-breeding analogy, it is indispensable and fully cognitive in Mitchison. Wilhelm presupposes individualism as the only, undebatable value; this is not an experimental or cognitive stance. Sargent's clones are explored as individuals. In Mitchison cloning is a way of saving humanity, with its pros and cons, regardless of the shibboleths of individualism: that is, figuring in the price and limits of the experiment, as befits a cognitive endeavor.

#### 4. On Cognition in Technoscience and SF

My final section shall suggest some conclusions about how SF may deal with scientific themes. However, having been often challenged and/or misunderstood as to my insistence on cognition, I wish first to continue the above discussions on cognition in (techno)science and SF.

To approach this, my argument so far confirms that SF uses of scientific themes may go one of two ways. The three stances discussed earlier – *gimmickry* (pegs to hang an unrelated plot on), *fear of science*, and sharing the illusions of *technocracy and magical power* – have not led to satisfactory narrations, never mind other social usefulness. What seems to me may be usefully taken over is the experimental method. This stance and manner of proceeding can make a narrative too observe a cognitive logic, drawing salient conclusions about the pros and cons of the hypothesis chosen – as Le Guin and Mitchison do – by immersing it into the life-world of human relationships as we know them: for all relationships that we can even imagine will be analogies to those we know. Fiction cannot decide about the scientific feasibility of the hypothesis, it can only assume it (e.g., cloning) as given and investigate its collective and distributive consequences. Therefore, these relationships always speak of the author's present, whatever the ostensible spacetime chosen for the narrative and its pleasing or misshapen anamorphic distortions. Directly, the SF relationships speak, more or less coherently, about the agents and spacetimes of the narration; but deep

down they speak about us, or the possible choices facing us: that is, they speak in roundabout, parabolic ways. The ideal verbal mode of such fiction is, paradoxically, a hypothetical imperative: if A and B, then necessarily C.

This is quite enough, however, to arrive at some conclusions: to begin with, as Mitchison shows, that humanity is within the present power and economic relationships totally immature for the development of genetic manipulation. It is true that a majority of scientists, paid by private corporations or the State, sing its praises. But it is equally true that probably the majority of independent scientists have produced copious and well-documented evidence that the insertion of genetic material into cell structures is happening in conditions of huge gaps in knowledge and may easily cause instabilities in those structures. In fact, for scientific rather than profit purposes, the “molecular” concept itself of an all-determining gene is being questioned (cf. Fox Keller-Winship). It is simply untrue that there are, or there can be, genes “for” obesity, homosexuality or cancer. This is the latest, and most powerful, of attempts to deny the social responsibility of people which have characterized reactionary views of biology since phrenology, eugenics, the “crime chromosome,” “sociobiology,” and so on.

Now today perhaps half of all US scientists and engineers work for military priorities (cf. C.H. Gray and Tirman ed.), and a major part of the other scientists work for private corporations. Thus, this supposedly “value-free” technoscience is the central means for – and intimately shaped by use for – shooting war or the equally ruthless war for profit. A major part of “[t]echnoscience is a military affair,” or, more clearly, “by and large, technoscience is part of a war machine and should be studied as such” concluded Latour, who is by no means Left-wing; his data show that ca. 80 percent of US federal obligations for research and development were in 1986 devoted to “defense” (*Science* 171 and 172). This underwent a small dip after the collapse of the USSR but progress has been saved (the profits have been saved) by the Gulf Oil war and subsequent US wars. What is left from military pursuits is in the biotechnological field mostly pharmaceutical companies and agribusiness, currently being relocated to the global South, where cheap labor and absence of environmental regulations prevails.

Since all work in military biotechnological labs, and much work from corporate labs, is concealed from the public eye, we don’t know whether

it's courtesy one of the former that we have been brought AIDS, but they are almost certainly bringing us new weapons and new ways to impoverish the mass of the people. Mitchison's novel is an excellent argument against the biotechnology applied by agribusiness today that destroys the ecology of food and biodiversity to achieve hugely profitable patenting of genetically modified seeds (see Dawkins, Magdoff ed., Shiva, and half a dozen more titles by the latter). For instance, something like 140,000 types of rice have been evolved in Asia over the centuries, fitting all local needs; the huge transnational food corporations – the identical ones that have for decades engaged in the culture of death producing pesticides, fungicides, bactericides, and herbicides, “cide” meaning “kill” – are working on five or six genetically modified strains, chosen in view of profit, and successfully attempting to destroy all the others. The financial, political, and scientific elites are in many such ways creating new huge sources of profit at the possibly irreversible expense of our collective life-world. This is internationally enforced by the IMF, WTO, powerful Northern States, and US military. Biology, the science of life, is thus being technologized into the science of death. Genome sequencing becomes an operation of prospecting analogous to maps for carpet-bombing.

In view of this overwhelming context, I would sorrowfully have to agree with the overall assessment, clearest in some radical feminists, that “the epistemologies, metaphysics, ethics, and politics of the dominant forms of science ... many of its applications and technologies, its modes of defining research problems and designing experiments, its ways of constructing and conferring meanings” lead to “the science we have [being] highly incorporated into the projects of a bourgeois, racist, and masculine-dominant state, military, and industrial complex” (Harding 9 and 138; her book is full of closely argued reasons for this judgment). Two briefest examples may further her argument. The first is that proof and disproof is in technoscience today so expensive that only a few “nations, institutions or professions are able to sustain it,” which means that “the production of facts and artefacts” will practically occur only in the rich and dominant countries of the North (Latour, *Science* 179) and within a scientific establishment dominated by bourgeois values, masculine gender, and mainly “White” people. Second are, not coincidentally, the stultifying bourgeois

oppositions at the fundamentals of modern science of “[m]ind vs. nature and the body, reason vs. emotion and social commitment, subject vs. object and objectivity vs. subjectivity,” where the first term is masculine and allowed and the second feminine and disallowed (Harding 125, and cf. Suvin “Cognitive”). If “the control over technics is the enabling practice for class, gender, and race supremacy” (Haraway 357), then it follows that this control must be changed. The ready subservience of science to capitalist destruction of life – theoretically speaking, the crude but still very powerful scientific positivism or empiricism and philosophical objectivism – must be decisively abandoned if we are to preserve the human species and most organic life as we know it. I have argued at length elsewhere (Suvin *Lack*) that we need a salvational science, refashioned to cope with qualities (first and foremost, the quality of people’s lives) and not only quantities.

Obversely, once we abandon positivism and objectivism, some striking parallels and analogies begin to obtain between the experimental cum hypothesis-building scientific method and narratives such as the best SF. Though my situating is indebted also to Foucault and Haraway, I shall begin by drawing some consequences from Bruno Latour’s splendid discussion in *Pandora’s Hope* of Pasteur’s proof of lactic fermentation, “Mémoire sur la fermentation appelée lactique” (1856). Latour wittily notes that “An experiment is a text about a nontextual situation, later tested by others to decide whether or not it is simply a text” (124). If the testing is institutionally accepted – by existing institutions or those created so as to verify it in practice, as is the case with all radical breaks or revolutions – then the experiment was not only a text but also the indication of possibilities inherent in a real life-world situation.

No cognitively successful experiment is a zero-sum game, for its output will be something new, not previously known from the elements or stock of resources used: “No matter how artificial the setting of an experiment, something new, independent of the setting, has to emerge, or else the whole enterprise is wasted” (*Pandora’s* 124–25). To my mind some of the elements in the artificial or laboratory setting also may be new, for example, the spacetime or some agents of the SF story. But not all the events and/or existents (narrative agents and objects) can be new, and most important: the relationships established must be translatable back

into the reader's life-world relationships. Like a lab experiment, a piece of fiction is an event resulting in new insights, or better a new transmissible and public competence of those reprocessing and if need be reapplying the experiment or the story. "Pasteur authorizes the yeast to authorise him to speak in its name," the personal and the impersonal exchange credibilities. If the whole setup withstands later scrutiny, then the text itself will in the end gain authority through the behavior of the newly grasped lactic fermentation, which then becomes a recognized fact and, in Latour's term, "underwrite[s] the entire text" (132). It is striking how similar this is to a piece of cognitive fiction, SF or otherwise: Mitchison authorizes *Solution Three* to authorize her to speak in its name – in this case to allot it a real but dialectically limited historical significance and use.

Social needs, interests, and values deeply influence scientific inquiry, by causing "the adoption of frameworklike assumptions that determine the character of research in an entire field" (Longino 98), by categorizing possible ways of viewing as appropriate or inappropriate, in fact by constituting the object of inquiry. But then, this holds equally true for Romantic poetry, the Realistic novel – or SF. All cognition or knowledge, scientific or narrative, is shaped by the biases and restrictions, the positive and negative assumptions of a culture. Situations in which these assumptions nonetheless allow for significant choices within the production and consumption of scientific and/or fictional narrative testify to the existence of competing values and interests corresponding to competing social classes within or across nations. In such more or less open situations we can choose to which values and allegiances we are accountable. This cannot be reduced simply to the polarity or even the spectrum between cognitive and non-cognitive: in the complex societies of, say, the last 100 years, cognitive perspectives themselves may be different, competing or complementary, rather than exclusive.

Of course, there are also important differences between the texts and practices of modern science and modern fiction; I shall just mention two: narrative strategies and collective validation. They seem to me to flow out of the overriding ends of such texts. The ideal scientific text will become "tacit knowledge" in the fundamentals of a discipline and not be consulted any more: "Who refers to Lavoisier's paper when writing the formula H<sub>2</sub>O for water?" (Latour, *Science* 43). To the contrary, the ideal fictional

or esthetic text will be consulted again and again: the Sun of Homer still shines on us (or this is the illusion the text powerfully stirs up in the readers). To that end, the central strategy of narrative fiction is action by anthropomorphic agents – SF critics sometimes call them psychozoas – in a very specific spacetime (chronotope); the discourse of science eschews both. In its place, the stories of science have allegorical agents – Latour wittily compares a discovery to a medieval hero triumphing against all adversities and adversaries (ibidem 52–54) – and a neutral, supposedly eternal and ubiquitously valid, spacetime (clearly borrowed from Christian theology). These agents are first superpersonal and finally anonymous, a part of scientific furniture or accepted “tacit knowledge.” But then the technoscientific text is part of a different practice, in which it must include inbuilt mediators toward validation: the system of referring to previous works in the field, enlisted as allies or downgraded as aberrant antagonists (cf. ibidem ch. 1B), and the mathematical parts (usually organized into graphs). As to validation, Pasteur had an undoubted adjudicator of competence, the Academy of Science in Paris, with what Foucault has called a fixed set of formal criteria; we have instead the marketplace influenced by formal and informal criticism with competing ideological agendas.

Yet finally in both science and SF a take on the situation is required which defines what are its facts. Not only does the shape and quality of a fact follow a collective construction (cf. Latour, *Science* ch. 1A), largely through the confirmation of being subsequently referred to, but no fact exists outside of an (implicit or explicit) theoretical framework: observation and meaning is in both science and SF always “theory-laden.” The Positivist belief in “facts out there” waiting only to be properly “dis-covered” made sense when it was guaranteed by God; today it is only hidden quasi-theology. The only useful discussion is one about the degree and character of theory-ladenness: that is, how come that some hypotheses work better, have a broader scope, enable us to intervene more successfully into the extra-textual life-world. For, in both scientific and narrative models, any resulting macro-fact, which is as a rule not atomic but a relationship (lactic fermentation, or the feasibility of a benevolent emergency dictatorship), may be judged outside the setting which brought the initial competence about. This is necessarily implicit in the model character as well as in the

mode of hypothetical imperative that I argued earlier. Such facts then cease to be an individual's idiosyncrasy and possession, they are collective – in fact, allegorical – agents travelling through human brains, institutions, and activities and making for new articulations of human experience. These agents are superpersonal, part and parcel of an accepted tacit knowledge.

In that sense, in the sense of “a community's practice of science rather than of an individual's [practice]” (Longino 74), science is “objective” – that is, not simply a matter of an arbitrary personal horizon; and we can legitimately discuss “the distinction between objectivity-increasing and objectivity-decreasing social values” inside science itself (Harding 23). But then I'd immediately claim the same status for at least a number of major bodies of narrative and metaphorical texts, such as some clusters of SF. They too set up hypotheses that can be tested both “by comparison with experiential data” and by “conceptual criticism” (*ibidem*), they too have tacit knowledges (genre conventions). A real strength of SF lies in its cumulative nature, reposing on the frequent readers' “genre memory,” which up to a point mimics the experimental method and thus stabilizes the genre athwart the competing agendas. Drawing on Helen Longino, “knowledge” or “cognition” have to be thought of less rigidly than official scientism would have us believe since Newton. It is a shifting ensemble of “more or less coherent sets of hypotheses, theories, and experimental-observational data accepted by a culture at a given time because this body of ideas functions as a public fund of justification and legitimation for new hypotheses as well as for action and policy” (185). I'd modify this definition somewhat, for example, adding images to ideas. But from its horizon it follows that both science and SF are “social knowledge” which can become a “public resource ... and ... a basis for action” (75–76).

## 5. Other Suggestions Toward a Conclusion on SF with Themes from Science

I think all of this leads to some provisional final observations. First, the signifier (say, cloning) has no transhistorical connection to a fixed

signified. As in any parable, the “vehicle” is not all-determining: as mentioned in the conclusions about Stapledon, different signifiers or vehicles may be used to converge on the same signified or “tenor”; this too points to the crucial role of the parable form. More startlingly, the same signifier may be used for different tenors. As Saussure said for other types of linguistic signifiers, this relationship is arbitrary, or better, not eternal or “natural” but ideologically and formally determined within a precise historical society and for a precise readership. It would thus be possible to enlarge this little investigation with many other texts.

One example would be genetic modification to prevent destructive technoscientific warfare. This very meritorious if scarcely realistic impulse is used by Michael Bishop’s *Beneath the Shattered Moons* (1976, original and better title *And Strange at Ecbatan the Trees*) to foreground the role of the artist as mediator between the ruling class and the plebeians. As usual in SF even before *The Time Machine* (say in Restif, Mary Shelley, Bulwer-Lytton or Hudson), the discourse about classes circumvents the reader’s psychic censorship against this taboo matter by turning them into different races. But in the case of irreversible genetic changes, one would have to ask: who would control the controllers or modify the modifiers to make them fit for such interventions?

Another example would be Cordwainer Smith’s interesting “Underpeople” stories using, in a grotesque and violently hyperbolic key, animals humanized by somatic manipulation. They obviously figure forth – in narratives such as the one of D’Joan, the Joan of Arc of the Underpeople – a rare thoughtful instance of the US ruling class’s guilty conscience at the treatment of Blacks, colonials, and underclasses in general, as I tried to demonstrate by considering one story of his at some length (Suvin “SF as Parable”). Or, for a further example, telepathy is in SF either a wet dream of power triumphing over persecution (van Vogt) or a desire for fusion with others to escape loneliness and form a collective (from Sturgeon’s *More Than Human* on); this latter type may include sympathetic mutant races as obvious metaphor for persecuted minorities (“Lewis Padgett”) or have for its downside the same fear as in Wilhelm of monolithic unification and total conformity (Wyndham).

Outside factors of current fashion and sociolect determine whether a superman or super-race must also be mutants, telepaths or simply from another planet. Biology is not strictly necessary as a pseudo-scientific justification of such parables.

I chose mutation and cloning because it seems that anything dealing with the intimate constitution of a human organism, such as heredity, is more overtly metaphorical and revelatory than other themes (such is also the case, e.g., of strange exobiological sex in Farmer, Sturgeon or Tiptree). Thus, while it would also be possible to deal with other biological themes, the cognitive yield would in my opinion not change too much.

Finally, this whole investigation suggests that we are here dealing with a new, modern (NOT Post-Modern) form of parable, about which I've also written at length in the mentioned essay on C. Smith. To repeat, the parable has perennially been the privileged genre – and even more: the privileged method, which can therefore extend to stories of any length – of fruitfully marrying textual seduction (in the vehicle) and cognitive consummation (in the tenor). It has traditionally been a way of intimately relating doctrine to fiction – and vice versa. The traditional politico-religious point of the parable is to open the listener's ears to the irruption of (often new) understanding, Ernst Bloch's "aha-effect": "O now I see that the tiny grain of mustard seed growing into the biggest bush of them all is Christ's Word about the Kingdom of Heavens growing into my heaven-reaching faith in it!" However, after Marx and Nietzsche it's no go for parables which trust in the Transcendental Signifier, the doctrinal tenor as soul or static essence, to which is then adjusted the imaged story, the vehicle as sensual body: this cannot satisfy. The loose modern parable is not dependent, as the classical (say, Synoptic Bible) parable was, on a firm doctrine within which a given vehicle can have only one tenor or conclusion. Rather, it tests new and fragmentary cognitions and doctrines, in feedback between the horizon aimed for and the narrative itself. Post-industrial cognition can only proceed by experimental construction out of "nature's" (the production mode's) constriction, the main constrictive source of strength and of resistance in capitalism being the money economy and the profit motive.

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