Richard Dawkins' *The Selfish Gene* – en litterær lesning, av Helene Nilsen

Denne masteroppgaven tar sikte på å lese den populærvitenskapelige klassikeren *The Selfish Gene*[1] på dens egne premisser, med fokus på representasjon og tekstlige strategier. *The Selfish Gene* kan klassifiseres som 'public science' fordi den både populariserer vitenskapelige konsepter for et bredt publikum, og samtidig henvender seg til kollegaer innen naturvitenskapene med det Dawkins beskriver som et nytt perspektiv på evolusjonsteori.

Innen enkelte biologiske forskningsmiljøer blir *The Selfish Gene* regnet som en milepæl i evolusjonsteori idet den markerer skiftet fra "gruppeseleksjon" tanken om at naturlig seleksjon fungerer på gruppenivå, til "genseleksjon".

Denne analysen vurderer ikke den sannhetsgehalten i det vitenskapelige fundamentet som *The Selfish Gene* bygger på. Ei heller kan lesningen klassifiseres som "moralsk" eller "politisk" – idet den ikke i videre grad tar stilling til hvorvidt begrepet "egoisme" bærer med seg moralske implikasjoner, og heller ikke argumenterer for at Dawkins gjennom boken promoterer sitt personlige politiske syn. Disse aspektene har blitt, og blir stadig, utførlig diskutert. Videre dreier lesningen ikke rundt spørsmål som "Finnes det objektiv sannhet?"

Denne analysen kan snarere leses som et forsøk på å innta et perspektiv løsrevet fra den polemiske motsetningen mellom C. P. Snows "to kulturer" med spørsmålet: Hvordan kan litterære leseteknikker applikeres konstruktivt på popularisert vitenskap? Oppgavens første kapittel tar utgangspunkt i Foucaults begrep "forfatterfunksjonen" og diskuterer et utvalg forskjellige, og til dels motstridende lesninger av *The Selfish Gene*. De to følgende kapitlene utgjør nærlesningen av boken.

Kapittel 2 fokuserer på bokens fundamentale strukturelle strategier som personifisering/besjeling av gener og organismer (så vel som disses "avsjeling"). I dette kapittelet blir også konseptualiseringen av genet, eller replikatoren, i *The Selfish Gene* undersøkt, sammen med den narrative fremstillingen av genetisk seleksjon.

Kapitel 3 tar for seg de forskjellige stemmene som kommer til uttrykk i Dawkins' argumentasjon, både i teksten og i fotnoter/forord, og diskuterer hvordan disse, sammen med forfatterfunksjonen, bidrar til instruere lesning og kan sies å konstruere en ideell leser i teksten. Videre belyses bruken av analogi i fremstillingen av det genetiske rasjonale som teksten etablerer.

Til slutt legges analysen til grunn for en diskusjon av hvilket normativt vitenskapssyn *The Selfish Gene* kan sies å formidle, og av hvordan teksten kan forstås som en lesning av naturlige fenomener.

[1] Først utgitt i 1976, til norsk i 2002 ved Arne Hem: Det egoistiske genet

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Popular Science – Common Ground

A Literary Critique of Richard Dawkins's *The Selfish Gene*

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Introduction:

I. Public Science: A Contextual Framework

The purpose of this thesis is to employ reading techniques from literary criticism in a reading of Richard Dawkins's work of popular science *The Selfish Gene*, first published in 1976, and generally considered the breakthrough of his authorship. Richard Dawkins, currently professor Emeritus teaching Evolutionary Biology and Science Literacy at the New College of Humanities in London, has an impressive track-record and a virtually unparalleled reputation as a mediator of science. He has made and participated in numerous TV-series promoting science as well as giving lectures and participating in the public debate. From 1995 until 2008, Dawkins held the professorship of Public Understanding of Science at Oxford UniversityHis long list of publications includes *The Extended Phenotype* (1982), *The Blind Watchmaker*, (1986), *Unweaving the Rainbow* (1998), the collection of essays, *A Devil's Chaplain* (2003) and *The God Delusion* (2006).

Although *The Selfish Gene* was published in the 1970s, and thus not as a part of Dawkins's position as promoter of science, it can be situated within the genre of 'public science'.[2] Elizabeth Leane, in her book *Reading Popular Physics, Disciplinary Skirmishes and Textual Strategies*, observes a distinction between 'pop science' referring to any representation of science in the popular culture, such as science fiction series and so forth, and

[2] Leane, Elizabeth: *Reading Popular Physics, Disciplinary Skirmishes and Textual Strategies,* Ashgate Publishing Limited, Hampshire and Burlington 2007, 8

'popular science,' which may refer to 'public science' or 'public understanding of science'[3]. Leane cites Frank Turner[4] and his definition of public science as "the body of rhetoric, argument and polemic" produced by 'public scientists' in the process of "'justifying their activities to the political powers and other institutions,'."[5]

The genre of 'public science' and the notion of 'public scientists' are connected to what Leane refers to as the "popularization boom of the 1990s."[6] In 1995, two books were published which addressed the same phenomenon. In the UK, John Carey edited the anthology *The Faber Book of Science*.[7] In the introduction, he writes:

> Fortunately for this anthology … popular science has improved immensely in the later twentieth century. Writers like … Stephen Jay Gould, Peter Medawar, Stephen Hawking ... and Richard Dawkins have transformed the genre, combining expert knowledge with an urge to be understood, and bridging intelligibility gap to delight and instruct huge readerships. In the process, they have created a new kind of late twentieth century literature, which demands to be recognized as a separate genre, distinct from the old literary forms, and conveying pleasures and triumphs quite distinct from theirs.[8]

This separate genre may be productively categorized as 'public science'; professional science written in an accessible language aimed at a general readership, thus both entertaining and informing the public. In the USA, John Brockman edited a collection of interviews with 'public scientists,' including Richard Dawkins, under the title *The Third Culture*.[9] The title explicitly refers to C. P. Snow and his Rede lecture, "The Two Cultures" from 1959[10] where he polemically depicted a state of mutual ignorance between the "two polar groups" – 'physical scientists' and 'literary intellectuals' the latter of which "incidentally while no one

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[3] Ibid

[4] Frank Turner was John Hay Whitney Professor of History at Yale University

[5] Leane, *Reading Popular Physics* 8

[6] Ibid

[7] Carey, John (ed) *The Faber Book of Science,* Faber and Faber, Ltd, London, 1995

[8] Ibid xiii

[9] Brockman, John: *The Third Culture*, Touchstone, New York, 1995, 27

[10] Snow, C. P. "The Two Cultures" Published by Cambridge University Press, 1959, http://s-f-walker.org.uk/pubsebooks/2cultures/Rede-lecture-2-cultures.pdf

was looking [had taken to] referring to themselves as 'intellectuals' as though there were no others."[11] While Snow proposed a potential third culture, Brockman's Third Culture does not correspond to this suggestion:

> In Snow's third culture, the literary intellectuals would be on speaking terms with the scientists. Although I borrow Snow's phrase, it does not describe the third culture he predicted. Literary intellectuals are not communicating with scientists. Scientists are communicating directly with the general public ... what traditionally has been called "science" has today become "public culture."[12]

In Brockman's Third Culture, then, the contributors are seen as redefining the conception of culture altogether, inscribing 'public scientists' as the new intellectuals in what appears to be a cultural revolution, a democratization-process of knowledge distribution:

> Throughout history, intellectual life has been marked by the fact that only a small number of people have done the serious thinking for everybody else. What we are witnessing is a passing of the torch from one group of thinkers, the traditionally literary intellectuals, to a new group, the intellectuals of the emerging third culture.[13]

The Third Culture 'manifesto' furthermore represents a literal understanding of the battle of 'two cultures' presumably resulting in victory and defeat on the part of the combatants: "The Third Culture consists of those scientists and other thinkers in the empirical world who, through their work and expository writing, are taking the place of the traditional intellectual in rendering visible the deeper meanings of our lives, redefining who and what we are."[14] The 'passing of the torch,' and the notion that Third Culture thinkers are 'taking the place of literary intellectuals' suggest that there is room for only one point of view from which the questions of 'who and what we are' may be defined and answered; it is Snow's polemical device of a battle of 'two cultures' taken to its literal extreme.

[11] Ibid 2
[12] Brockman, *The Third Culture* 18
[13] Ibid 19
[14] Ibid 17

This somewhat aggressive attitude should be seen in the context of the so-called Science Wars which was largely played out in USA during the 1990s, culminating in the famous Sokal-hoax in 1996, where Alan Sokal, Professor of Physics at New York University, succeeded in publishing a gibberish article in the academic journal *Social Text*, thus allegedly 'disrobed' postmodern theorists as 'intellectual imposters'.[15] The debate between representatives of the 'soft' and the 'hard sciences' was, as the term suggests, heated and rather counterproductive in that it mainly served to confirm and deepen the gap between these two generalizations of academic traditions. In the process, representatives of the 'soft sciences' were to some extent made synonymous with 'constructivists'. As Leane comments, "it appears that both constructivist critics and those who defend science against constructivism often resort to building their arguments around a caricature of their opponent's view".[16]

Richard Dawkins arguably advocates the Third Culture 'manifesto' in his essay "Postmodernism Disrobed" which was first published in *Nature* Magazine in 1998,[17] and reprinted in Dawkins's essay-collection *A Devil's Chaplain* in 2003:

> Suppose you are an intellectual impostor with nothing to say, but with strong ambitions to succeed in academic life, collect a coterie of reverent disciples and have students around the world anoint your pages with respectful yellow highlighter. What kind of literary style would you cultivate? Not a lucid one, surely, for clarity would expose your lack of content.[18]

Dawkins's criticism is seemingly directed towards American postmodern theorists: "how shall we know whether modish French 'philosophy', whose disciples and exponents have all but taken over large sections of American academic life, is genuinely profound or the vacuous

[15] Dawkins, Richard "Postmodernism Disrobed" from *A Devil's Chaplain* 2004 (2003) 48-53
[16] Leane 2007, 77
[17] *Nature*, No 394, 9th of July 1998, 141-143
[18] Dawkins, "Postmodernism Disrobed" 48

rhetoric of mountebanks and charlatans?"[19] Leaving 'philosophy' in quotation suggests that the criticism is not only directed towards the 'disciples and exponents' of French philosophy, but aims to devaluate French philosophy represented by Michel Foucault and Jacques Derrida as sham intellectualism. Similarly, Cambridge University is placed in a ridiculous light because it "saw fit to give Jacques Derrida an honorary degree."[20] The prominent position of this 'modish philosophy' seemingly justifies the annihilation of a school of thought, in the place of an approach criticising specifically defined problems of a mode of discourse. In this generalization, the postmodern philosophic jargon becomes the counterpoint to an ideal clear-thinking scientific discourse. Within this paradigm, the notion of 'public science' and of 'public scientists' communicating scientific ideas in a clear and accessible language can be seen as a deliberate effort to counteract excessive use of academic jargon.

II. Science and Literature: The Selfish Gene as Public Science

Although *The Selfish Gene*, as mentioned, was written in 1976 and thus cannot be said to promote Brockman's Third Culture as such, the genre features of a type of public science are evident in the preface to the first edition, where Dawkins reflexively dedicates the book to "three imaginary readers" [21]:

> First, the general reader, the layman. ... I have worked hard to try and popularize some subtle and complicated ideas in non-mathematical language, without losing their essence. I do not know how far I have succeeded in this, nor how far I have succeeded in another of my ambitions: to try and make the book as entertaining and gripping as its subject matter deserves ...

[19] Ibid 53
[20] Ibid
[21] *The Selfish Gene* xxi

> My second imaginary reader was the expert. He has been a harsh critic, sharply drawing in his breath at some of my analogies and figures of speech. His favourite phrases are 'with the exception of'; 'but on the other hand'; and 'ugh'. I listened to him attentively, and even completely rewrote one chapter entirely for his benefit, but in the end I have had to tell the story my way ... Yet my greatest hope is that even he will find something new here; a new way of looking at familiar ideas perhaps; even stimulation of new ideas of his own ...
>
> The third reader I had in mind was the student, making the transition from layman to expert ... For the student who has already committed himself to zoology, I hope that my book may have some educational value ... [22]

The lay-reader, of course, represents the popular appeal of the book. The act of popularization, according to Leane, mediates between different communities in diverse ways: In a basic sense, it translates scientific ideas so that they become accessible to lay-readers; "it is a communication from an expert to a reader outside of his/her specialist field."[23] In this process, "scientists come into immediate contact with the tools of the literary trade."[24] Popularization as translation of established scientific concepts becomes a creative process opening for a range of literary devices. In this sense it may be seen as a liberation from the somewhat rigid conventions of professional scientific papers, such as the use of the passive voice and the so-called IMRAD-model consisting of Introduction, Methods, Results and Discussion.[25] The translation of science into an accessible language opens for a mediation between science and literature.

Dr. Paola Spinozzi, Senior Lecturer in English Literature at the University of Ferarra, comments on this process in her essay "Representing and Narrativizing Science"[26]:

> Translating in accessible or creative ways what has been defined in scientific terms proper entails actively taking part in the production of and response to scientific knowledge. Multiple forces work together dynamically: the exposition of scientific methods and theories through explanation and argumentation; narrativizing and

[22] Ibid xxi – xxii

[23] Ibid 3-4

[24] Ibid 4

[25] Hurwitz Brian and Paola Spinozzi, Eds: *Discourses and Narrations in the Biosciences,* V&R Unipress, Goettingen, 2011, 14

[26] Spinozzi, Paola: "Representing and Narrativizing Science": Hurwitz and Spinozzi 2011, 30-60

> fictionalization through different modes of emplotment and reference to characters; self-reflexivity and meta-discourse, evidenced in a conscious use of language as a medium that transforms scientific knowledge in representation.[27]

Spinozzi points out how literary strategies such as narrativation are closely linked to fictionalization, and the creative process of translation has the potential of 'transforming scientific knowledge'.

Dawkins's expert reader, however, suggests that this is not merely a translation of 'what has been defined in scientific terms proper'; it is also conveying new scientific perspectives to other experts. Thus, the lay-reader is invited into the realm of science in the making. The expert reader in a sense warrants for scientific quality: 'he has been a harsh critic,' and his presence establishes an authority of the book, demanding to be taken seriously.

The essential focus in the field of Science and Literature is that of representation, and this is also the focus of my thesis. This perspective, however, does not mean 'reducing' scientific language to 'fiction', as Charlotte Sleigh points out in her book *Literature and Science*[28]:

> [M]etaphors and images act as frames for knowledge. They allow us to understand scientific ideas, and they actively affect our understanding. As such, scientific facts are always embedded in their representation, a phenomenon which is in large part subjective and literary or artistic … Only when they have words and images attached to them are they meaningful to us – and these words and meanings bring along a whole host of allusions, history and connotations that themselves become part of the representation as the science is further developed … [T]he argument about representation does not state that science is 'merely fiction'. Rather, it recognizes the contingent construction of scientific representation and the embedding of its symbols in the language and culture of its time.[29]

[27] Ibid 55

[28] Sleigh, Charlotte, *Literature and Science,* Palgrave Macmillan, Hampshire 2011

[29] Ibid 5-6

III. Motivation, Difficulties and Methodological Approach

My own initial motivation for this thesis was a vague feeling of discomfort, brought on by public science mediation such as the Norwegian TV-series *Hjernevask*,[30] which polemically juxtaposed the ideas of 'soft sciences' with the facts of the 'hard sciences', and Richard Dawkins's TV-series *The Genius of Charles Darwin*,[31] where evolutionary theory and natural selection are polemically presented in a scientific, social and philosophic context. On the one hand, the polemical note struck me as unjustified, while on the other, the productions rested on the authority of scientific fact, which it was not my prerogative to refute. The approach to science that these TV-series offered seemed on the one hand to me to trespass into the realms of metaphysics particularly when methods of the 'soft sciences' were contrasted to the verifiable evidence of physical science and these were used to explain social phenomena. The way physical evidence was presented suggested that *interpretation* and *representation* was downplayed, as if scientific evidence, as it were, spoke for themselves. On the other hand, the notion that the physical sciences are concerned with a material reality rather than with language and interpretation is prevalent, also in academic communities. Still, I had a feeling that the TV-series somehow abused the authority that reference to verifiable evidence gives.

On this background I attended the two courses at the University of Bergen, organized by the Centre for the Studies of Sciences and the Humanities and the English Department respectively. One was *Human: Nature and Culture*[32], offering a series of lectures by

[30] Direct translation: *Brainwash*, broadcasted on NRK 1 during the Spring of 2010 and hosted by the Norwegian comedian Harald Eia, produced by Harald Eia and Martin Ihle

[31] Broadcasted on NRK2 in January 2009, written and presented by Dawkins, Richard, produced by Russel Barnes and Dan Hillman, distributed by British Channel 4 and Richard Dawkins Foundation for Reason and Science

[32] Dannelsesmodul, VIT 210: Menneske: Natur og Kultur, coordinated by Jan Reinert Karlsen

representatives from the humanities as well as evolutionary biologists, thus encountering science in a more formal setting. In this forum, and through discussion with fellow students, I began to understand that science is not a hermetically closed sphere, but may be productively approached and debated. Subsequently, I attended the course *Science and Literature*,[33] where I was introduced to Gillian Beer's impressive work *Darwin's Plots*[34] in which Darwin's *On the Origin of Species*[35] is subjected to literary analysis and situated in a cultural context. The book explores the relationship between thought and language, between science and its representation, and demonstrates how imagination and metaphor can play important parts in the creation of scientific theory in the initial phase when "a fact is not quite a scientific fact at all."[36] Beer's *tour de force* demonstrates how a literary reading may indeed function productively in illuminating how language constraints and contributes to scientific thinking, and how the metaphors of scientific representation may gain a life of their own in the encounter with the public. Her analysis, rather than 'disrobing' scientific representation, serves to open up the text and, by demonstrating its many layers of potential meaning, shows *how* scientific representation may come to signify. Beers offers the crucial insight that: "One's relationship to ideas depends significantly on whether one has read the works which formulate them. Ideas pass more rapidly into the state of assumptions when they are *unread*. Reading is an essentially question-raising procedure."[37] Beer's reading thus operates outside of the somewhat restricting construction of 'the two cultures'.

From this starting-point, I decided to make Richard Dawkins's *The Selfish Gene* the subject of my thesis, and to use Beer's *Darwin's Plots* as a methodological framework. This seemed like a workable prospect, since both writers are concerned with evolution and both

[33] By Randi Koppen, Fall 2010
[34] Beer, Gillian: *Darwin's Plots*, 3rd ed. Cambridge University Press, 2009 (1983) 4 (Beer's italics)
[35] Darwin, Charles, *The Origin of Species*, (1859), Oxford University Press, 2008
[36] Beer *Darwin's Plots* 2
[37] Ibid 4 (Beer's italics)

address a general readership as well as other experts. Two problems may be distinguished in my initial approach. One was practical: Beer's historical approach was not directly transferable to a reading of *The Selfish Gene*, because the scientific ideas the book promotes are still subject to scientific debate. The publication history of *The Selfish Gene* testifies to its prevailing relevance: The original edition was published in 1976, followed by a second edition in 1989 featuring two additional chapters and a new preface as well as explanatory and commentary end-notes, featuring modifications and response to criticism as well as reference to later research. In 2006, at the anniversary for the original publication, the book was re-published as a 30th Anniversary Edition featuring an additional preface. Furthermore, and obviously, the science of the Victorian Age is not automatically comparable to contemporary science.

The second problem of my initial approach was more personal than methodological. Although I was aware of the pitfall of an overly 'constructivist' approach, and did not set out to contest the notion of objective knowledge, my reading was initially influenced by the unease that motivated my interest for this field of research in the first place, in the sense that the first drafts of my thesis were written with the aim of justifying the notion of scientific 'trespassing'. An emotional reading aiming simply to challenge an 'authority of science' would constitute a framework in which Beer's methodological concepts would function as weapons of destruction, quite the contrary to how they are employed in *Darwin's Plots*. In consequence, the reading would rest on presumption, an in effect leaving the text *unread.* Therefore, I had to work to disentangle my analysis from of the perspective arising from my original discomfort to enable an enquiry into the cause of this unease.

Although I abandoned the idea of performing a comparative analysis of Beer's Darwin and Dawkins's *The Selfish Gene*, I found that some of Beer's textual approaches could still constitute a starting point of enquiry. In particular her observations concerning the

anthropocentric nature of language and the challenge of tackling a language that is imbued with intention in describing a faceless process of evolution have proved productive for my reading. I have, however, not adopted Beer's approach to authorship. Whereas her reading of the *Origin* takes into consideration Darwin's personal journals, letters and notebooks in order to illuminate and support her reading, I have been concerned with the tension between the explicit intention of *The Selfish Gene* and the potential meanings that appear in a close-reading. This approach has been particularly fruitful due to the publication history of Dawkins's book, where the added material of subsequent edition has introduced different in-text voices. However, this reading strategy too has been inspired by Beer, who distinguishes the active voice of the *Origin* as a "necessary methodological control."[38]

While Beer's work has been a great inspiration, it cannot be said to be suited for addressing the scientific perspective that *The Selfish Gene* conveys. As due attention has been paid to the moral implications of the notion gene selfishness, I have not performed a particularly political, moral or ideological reading of Dawkins's book in this thesis. Rather, I have tried to read the book on its own terms, and to take into consideration its status in the community of evolutionary biology. Leane observes the potential of public science to "act as forums for scientists to promote or defend rival views within a scientific field, or to engage, implicitly or explicitly, in cross-disciplinary debate."[39] The fundamental and explicit scientific view that *The Selfish Gene* promotes is that of 'gene selection' as opposed to 'group selection' – the notion that natural selection benefits the 'survival of the species' and works for 'the good of the species'. A key issue in the debate of the level of natural selection – group level, individual level and gene level – is the question of natural altruism, for instance of whether individual can be said put their own life to risk for the benefit of the group. As mentioned, I

[38] Beer *Darwin's Plots* 61

[39] Leane *Reading Popular Physics* 4

have not performed a moral reading, and thus, my thesis is not structured around the dichotomy of selfishness ≠ altruism. This subject will, however be addressed with reference to other readings of *The Selfish Gene*.

In the process of establishing the book's 'own terms', I have studied works both by those of Dawkins's peers who agree with his selfish gene theory, such as the biologist Alan Grafen, and opponents within the scientific community, such as Fern-Elsdon Baker, and Mary Midgley. Furthermore, I have examined how the gene concept of *The Selfish Gene* correlates to other gene conceptions. This is not to say that I have worked to evaluate the scientific contents in an effort to establish the truth-value of *The Selfish Gene.* This thesis is concerned with the act of scientific representation that the book performs. Scientific representation cannot, however, be regarded as situated outside of discourse, or outside of the culture of its time. Science is both a part of a common culture, and a distinct culture with its own criteria and conventions of representation and meaning, which I have, at least to some extent, paid heed to. At the same time, science and literature are two distinct disciplines, and it is the differences of the academic traditions that make the interplay between the two interesting. It has been a challenge to try and strike a balance between an overly critical reading on the one hand, and an overly sympathetic reading on the other, and rather make use of the tools of literary criticism in order to open up the text and investigate the effects of textual strategies.

One such textual strategy is that of narration: Greg Myers, Professor of Rhetoric and Communication at Lancaster University, finds that the mode of narrativity is a central aspect distinguishing popular and professional science writing:

> The professional articles I study create what I call a *narrative of science*: they follow the argument of the scientist, arrange time into parallel series of simultaneous events all supporting their claim, and emphasize in their syntax and vocabulary the conceptual structure of their discipline. The popularizing articles, on the other hand, present a sequential *narrative of nature* in which the plant or animal, not the scientific

> activity, is the subject, the narrative is chronological, and the syntax and vocabulary emphasize the externality of nature to scientific practices.[40]

The three 'imaginary readers' of *The Selfish Gene* introduced above illustrate how the book at once popularizes science for the benefit of the lay-reader and addresses an expert audience with new scientific perspectives. This duality, which I have categorized as 'public science', is reflected in the narrative strategies in the book: The opening of the argument introducing the gene is presented chronologically as a 'narrative of nature,' while the latter half of the book follows a 'narrative of science' introducing a series of models and examples, organized as illustrations of Dawkins's argument. This argument, or narrative of science, is based in the concept of *evolutionarily stable strategies* (ESS),[41] where Game Theory, often illustrated by the Prisoner's Dilemma, is used in mathematical analysis of animal behaviour, working out 'cost-benefit calculations' for particular strategies, i.e. relatively stable patterns of animal behaviour. The central argument of *The Selfish Gene* is that natural selection favours strategies that benefit the survival of genes, rather than individual bodies or entire species.

Thus, the narrative of the gene can be said to constitute a fundament upon which the argument – the narrative of science – is developed. Thus, the two modes of narration are intertwined. Leane comments on the function of the narrative of nature:

> [A]ssumptions (about the world, or about science) embedded in popularizers' narrative structures may not be recognized as such. It is important, then, for critics not to dismiss the narrative conventions of popular science as *only* a kind of formal sugar-coating over the 'hard' scientific content, but to subject them to analysis.[42]

[40] Myers, Greg, quoted in Swales, John, Genre Analysis: English in Academic and Research Settings (Cambridge Applied Linguistics) Cambridge University Press, 2002, (1990) 126 (Myer's/Swales Italics)

[41] A biological concept developed by John Maynard Smith in 1972

[42] Leane, *Reading Popular Physics* 109

In this thesis, I will analyze the narrative of nature, and considered how it may be said to function as a supporting component for the argument of selfish genes. Additionally, I shall also take into consideration a second scientific narrative: the Kuhnian notion of scientific development as a linear movement of progress.[43] I have also looked at other textual strategies in *The Selfish Gene*, such as the power of analogy and personification, which is a key component structuring the book. Along with an active voice guiding the reading, the structural device of personification can be said to urge a 'willed suspension of disbelief' on the part of the reader, which is reflected in the opening lines to the preface to the first edition of *The Selfish Gene*: "This book should be read almost as if it were science fiction. It is designed to appeal to the imagination. But it is not science fiction: it is science."[44] This opening at once enters into a dialogue with the reader with an injunction to both believe and not believe – thus emphasizing the tension between the fictional devices and the scientific message of popularization.

IV. Thesis Outline

Chapter 1 takes Foucault's article "What is an author?" [45] as its point of departure. After discussing how Dawkins may be seen as a reader of Darwin, I will go on to discuss Foucault's concept of the author-function, before I move on to consider some different readings of and approaches to *The Selfish Gene*. With reference to a polemic between Dawkins and Mary

[43] Kuhn, Thomas S: *The Structure of Scientific Revolutions* (1962), The University of Chicago Press, Chicago, London, 1996, which developed a perspective on the sociology of science

[44] *The Selfish Gene* xxi

[45] Foucault, Michel, "What is an Author?" (1969, English translation in 1979) From *Modern Criticism and Theory, A Reader*, ed. David Lodge, Longman, 1993 (1988) (All subsequent citations refer to this edition)

Midgley, I will also establish Dawkins as a reader of his own book, and account for his concept of *poetic science*.

Chapter 2, entitled "The Language of Convenience and Displaced Agency in *The Selfish Gene*", constitutes the first part of my close reading. This chapter is concerned with what I consider to be the fundamental structural strategies of the book, such as personification, narration and the gene-definition that *The Selfish Gene* operates with. The latter particularly regards the relationship between g*enotype*, an individual's set of genes, and *phenotype*, the genes' realization in terms of physical traits. Furthermore, I will examine the representation of the body as 'survival machine', both in terms of its function and its effect.

In Chapter 3, "Reading Nature" I extend the perspective of my close reading. The first half of this chapter addresses the multiple voices of *The Selfish Gene*, which I will categorize as author-function, the reflexive narrator and the meta-narrator, with particular focus on their potential to exert 'methodological control'. These categories are not meant to represent fixed entities, but different functions. From this starting point, I will show how the reader is addressed and situated in the text, and go on to argue that the multiple voices of the book appeal to an 'ideal reader'. The focus of the second half of the chapter examines the meaning potential of analogy, and discusses how this meaning potential affects the construction of a 'genetic rationale'

Chapter 1: Reading *The Selfish Gene*

> In 1976, a young Oxford biologist published a book called *The Selfish Gene*. To Richard Dawkins' own surprise and sometimes alarm, it became widely discussed, often misunderstood, and highly influential.[46]

1.1 What is an Author?

In his essay "What is an Author?" Foucault separates between scientific discourse and other discourses. The distinction is based in two aspects. One is that of the author-function, the function of the author's name:

> The author's name manifests the appearance of a certain discursive set and indicates the status of this discourse within a society and a culture … [W]e could say that in a civilization like our own, there are a certain number of discourses that are endowed with the 'author-function' while others are deprived of it.[47]

Foucault observes a reversal in scientific discourse: While medieval texts dealing with issues that we would now call scientific relied on author-name to guarantee truth, a reversal occurred in the seventeenth or eighteenth century, with the author-function fading away. Instead, scientific discourses were "received for themselves, in the anonymity of an established or always redemonstrable truth."[48] The anonymity of the author can be said to represent and support the notion that science 'speaks for itself', that it exists outside of language. One

[46] Introduction, Grafen, Alan and Mark Ridly Eds. Introduction to *Richard Dawkins: How One Biologist Changed the Way We Think, Reflections by Scientists, Writers and Philosophers*, Oxford University Press, Oxford, New York, 2007 (2006) xi

[47] Ibid 202

[48] Ibid 203

expression of the scientific practice of writing outside of the author-function could for instance be the conventional use of the passive in scientific texts. However as I have shown above, the genre of 'public science' which Dawkins represents does not adhere to these conventions.

I will return to the author-function after having discussed another aspect that, according to Foucault, distinguishes scientific from other discourses, namely the concept of "founders of discursivity": "They are unique in that they are not just the author of their own works. They have produced something else: the possibilities and the rules for the formation of other texts."[49] Founders of discursivity, then, are authors of works that provide a new approach or perspective, or even works that cause reactions leading to a different insight, providing a "possibility for something other than their discourse, yet something belonging to what they founded."[50] Foucault uses Marx and Freud as prime examples of founders of discursivity, and contrasts them to scientific discourse: "Re-examination of Galileo's text may well change our knowledge of the history of mechanics, but it will never be able to change mechanics itself. On the other hand, re-examination of Freud's text, modifies psychoanalysis …"[51] Following this argument, re-examination of the scientific founders' works cannot contribute to further research, because the original discourse becomes irrelevant in the course of scientific development. In other words, it seems that scientific truth relies on objective findings in research rather than the authority of the founder:

> [O]ne defines a proposition's theoretical validity in relation to the works of the founder – while, in the case of Galileo and Newton, it is in relation to what physics or cosmology *is* (in its intrinsic structure and normativity) that one affirms the validity of any proposition that those men have put forth.[52]

[49] Foucault, "What is an Author?" 206
[50] Ibid
[51] Ibid 208
[52] Ibid 207-208

In this perspective, science is seen as intrinsically progressive, in the sense that it is scientific progress, in terms of new findings and developments leading to increased knowledge that constitutes truth-value, rather than the founder of a specific discourse. Peter Baehr, in his work *Founders, Classics, Canons* (2002) notes that "It would appear, then, that in regard to the founding figure there is a recursive durability, a reflexivity, to 'discourses' that is typically absent in 'sciences'."[53] Following Baehr's line of argument, the separation between founders of science and founders of discourse seems to rest on the assumption that scientific development is a progressive mechanistic event, where new perspectives of universal validity replace each other on the basis of scientific truths detached from the scientific work that originated the theoretical discipline. However, as I will demonstrate below, the concept of 'founders of discourse' is tractable also in scientific discourse. It is worth adding that Foucault did not see the differences between scientific and other discourses as categorical: "It is not always easy to distinguish between the two; moreover, nothing proves that they are two mutually exclusive procedures."[54]

Dawkins refers to himself as a Neo-Darwinist. Modern Neo-Darwinism traces back to the 1930s, when 'the modern synthesis' of genetic inheritance was developed by Haldane, Wright and Fisher, implementing theories from genetics in the field of evolutionary biology, or natural selection, known as Darwinism.[55] From this starting point, Hamilton and Fisher established a perspective on natural selection from what is understood as the gene's-eye point of view, a concept which *The Selfish Gene* develops further.[56] Needless to say, the label Neo-Darwinism carries with it a reference to Darwin's original work. This back-referring

[53] Baehr, Peter, *Founders, Classics, Canons: Modern Disputes over the Origins and Appraisal of Sociology's Heritage*, Transaction Publishers New Brunswick, New Jersey, 2002, 15

[54] Foucault, "What is an Author?" 208

[55] Elsdon-Baker, Fern, *The Selfish Genious*, Icon Books Ltd UK, 2009, 5-6

[56] *The Selfish Gene* xvi

corresponds to what Foucault describes as one of the characteristics of works by founders of discursivity:

> [O]ne does not declare certain propositions of these founders to be false: instead, when trying to seize the act of founding, one sets aside those statements that are not pertinent, either because they are deemed inessential, or because they are considered 'prehistoric' and derived from another type of discursivity.[57]

While Darwin had no clear-cut conception of genes or genetic inheritance, his proposition of natural selection was not seen as false after the appearance of genetics. Instead, the concept of natural selection has been extended so as to include the gene as its primus motor. Additionally, Darwin had a speculative notion of *pangenesis:* "particles that preserve variations from generation to generation."[58] The concept of pangenesis has, according to Elsdon-Baker, largely been ignored, or 'deemed inessential', until recently,[59] but the somewhat 'prehistoric' genetic conception has not devaluated Darwin's evolutionary theory as such. While Darwin was not the only one working on evolutionary ideas in the 19th century,[60] his concept of natural selection has made him the father of modern evolutionary theory. Elsdon-Baker puts it like this: "[I] believe Darwin rightly has pride and prominence as the father of modern evolutionary theory. It was Darwin, and only Darwin, who had the vision, persistence and clarity of thought to turn it from a great idea into a comprehensive theory.[61]

The term Neo-Darwinism also seems to meet Foucault's definition of a founder of discursivity, in that "one defines a proposition's theoretical validity in relation to the works of the founder,"[62] rather than in relation to the normativity of the discipline. One might also say

[57] Foucault, "What is an Author?" 207
[58] Elsdon-Baker *The Selfish Genius* 91
[59] Ibid
[60] See Ibid part 1 for a thorough survey of the history of evolutionary theory
[61] Ibid 47
[62] Foucault, "What is an Author?" 207

that Darwinism is presented as *the* normativity of evolutionary theory. The founder as authority is detectable in *The Selfish Gene*: [T]he group selection idea is so deeply ingrained that Lorenz … evidently did not realize that the statement contravened the orthodox Darwinian theory."[63] However, not only Neo-Darwinists, but also their opponents may refer to Darwin as founding father and authority. Elsdon-Baker quotes the biologists Jablonka and Lamb:

> In evolutionary studies, because heritable non-genetic variations are often induced by the environment, we have to expand our notion of heredity and variation to include the inheritance of acquired variations, the once disparaged idea that was part of Lamarck's theory. In a sense, we have to go back to Darwin's original, pluralistic convictions. Darwin, unlike many of his dogmatic followers, saw a role for induced variation in evolution. Today, in the light of newly discovered epigenetic mechanisms, Darwinian evolution should include descent with epigenetic as well as genetic modifications, and natural selection of induced as well as random variations. Certainly, it should not be reduced to 'selfish genes'.[64]

The appeal to Darwin in order to re-examine evolutionary ideas, corresponds to what Foucault describes as a necessity to turn "back to the origin[65]": "The return is not a historical supplement which would be added to the discursivity, or merely an ornament; on the contrary, it constitutes an effective and necessary task of transforming the discursive practice itself."[66]

The plea to re-examine Darwin's theories in order to transform the discursive practice of evolutionary theory can be seen as necessitated by the power of definition held by Neo-Darwinists which Elsdon-Baker finds problematic: "Challenges to the Neo-Darwinian synthesis are sometimes represented as challenges to Darwinism. Similarly, Neo-Darwinists conflate their own ideas with Darwinism."[67] This observation illuminates the aspect of *reading* which is intrinsic to all discourse: the act of focusing on certain aspects while

[63] *The Selfish Gene* 8
[64] Elsdon-Baker *The Selfish Genius* 123
[65] Foucault "What is an Author?" 208
[66] Ibid
[67] Elsdon-Baker *The Selfish Genius* 103

excluding those that do not seem pertinent, simply the act of interpreting. Elsdon-Baker sees the neo-Darwinian reading of Darwinian theory as problematic for several reasons. First, on a general level, that this kind categorization of evolutionary theory may function counter-productively: "[I]n embracing the idea of 'Darwinism' or 'Neo-Darwinism' rather than evolutionary theory, we are perhaps creating an intellectual straitjacket for ourselves."[68] We could read this as a normative claim corresponding to Foucault's notion of separating scientific discourses: Ideal sciences should be established in relation to the normativity of the discipline rather than in relation to its founder. Furthermore, the phrase Neo-Darwinian gives the impression of being a mere extension of the original Darwinian ideas. These ideas may, then, be made to encompass a wider meaning than there are grounds for. Elsdon-Baker is specifically concerned with the place of religion in the neo-Darwinian theory:

> We clearly can no longer caricature the shift in thinking after the publication of *On the Origin of Species* as a leap from universal acceptance of 'creationism' to a battle to get evolutionary thought accepted … it implies a level of animosity between 'religious thinkers' and 'scientific evolutionary thinkers' which is both a misrepresentation and misleading.[69]

In the opening passage of *The Selfish Gene* we get an impression of the 'level of animosity' between the two modes of thinking:

> Living organisms had existed on earth, without ever knowing why, for over three thousand million years before the truth finally dawned on one of them. His name was Charles Darwin. To be fair, others had had inklings of the truth, but it was Darwin who first put together a coherent and tenable account of why we exist. Darwin made it possible for us to give a sensible answer to the curious child whose question heads this chapter. We no longer have to resort to *superstition* when faced with the deep problems: Is there a meaning to life? What are we for? What is man?[70]

The problem, Elsdon-Baker points out, is that Darwinism becomes an altogether too inclusive category, for several reasons: one is that this portrayal of evolution does not separate between

[68] Ibid 27

[69] Elsdon-Baker T*he Selfish Genius* 64

[70] *The Selfish Gene* 1 (My italics)

the 'origin of species' and the 'origin of life',[71] another that it goes beyond what is normally accepted to be the parameters of science.[72] However, the over-arching issue with the strong focus on the metaphysical impact of Darwinism is that it becomes much more dangerous to discuss problems regarding evolutionary theory publically, because critics may be seen as representing the 'wrong camp'.[73]

The consequences of this kind of either-or problem in relying on the founding authority of a discourse also become evident when attributed to Lamarckism, particularly with regard to the concept of inherited characteristics, as in the case referred to above, where two biologists criticized the concept of selfish genes and wished to 'expand the notion of heredity'. If the Neo-Darwinian reading of Darwin is accepted as the only reading of evolutionary theory, then statements such as these may be labelled 'anti-Darwinian'.[74] As Feldon-Baker shows, this is to some extent what is at stake in the neo-Darwinian discussion; to establish the 'true' Darwinism. While a re-examination of Darwin's texts will not change the course of evolution, it could change evolutionary biology theory and research.

In the context of the above discussion it is possible to establish Dawkins as a reader of Darwin. On this background, evolutionary representation in the *Origin* may also be relevant for analyzing the writings of Dawkins. However, Dawkins is, of course, also an author. But what is an author? While the above perspectives of Elsdon-Baker is mainly concerned with Dawkins as a critic of religion and with the somewhat antagonistic tone in much of his writing, there are, as we shall see, several other takes on Dawkins as an author. Foucault points out that

[71] Elsdon-Baker *The Selfish Genius* 160
[72] Ibid 168
[73] Ibid 135
[74] Ibid 242

> One cannot turn a proper name into a pure and simple reference. It has more than an indication, a gesture, a finger pointed at someone, it is the equivalent of description … The proper name and the author's name are situated between the two poles of description and designation.[75]

Description, e.g. biographical details, and designation: the attributes that a reader may assign the author, come together in the act of reading. This relationship is further complicated in *The Selfish Gene* which deviate from the conventions of scientific papers and use elements from fiction, or the essay, such as an active first person structuring the text. When performing a reading where the author is apparently homogenous to the first person speaking, the boundaries may become blurred between the 'proper name and the individual named', in this case also between the narrator and the author. Reading Dawkins, then, can be closely linked to the act of establishing the author-function; in fact, the act of reading Dawkins' texts may become *equal* to the act of establishing the author-function:

> [T]he author-function … does not develop spontaneously as the attribution of a discourse to an individual. It is, rather, the result of a complex operation which constructs a certain rational being that we call 'author'. Critics doubtless try to give this intelligible being a realistic status, by discerning a 'deep' motive, a 'creative power', or a 'design,' the milieu in which writing originates. Nevertheless, these aspects of an individual which we designate as making him an author are only a projection, in more or less psychologizing terms, of the operations that we force texts to undergo, the connections that we make, the traits that we establish as pertinent, the continuities that we recognize, or the exclusions that we practice.[76]

The author-function, then, is not an absolute figure; it is created by and in the process of reading. Elsdon-Baker's portrayal of Dawkins as author-function can be recognized as a projection of a 'deep motive' of religion-criticism: "[Dawkins] has presented himself as standing at the vanguard of clear-thinking rational science, fighting against a swelling tide of fanatical delusionists."[77]. By other readers, the focus on Dawkins as author-function is his status as an eminent and revolutionary scientist. In the preface to the anthology with the

[75] Ibid 200

[76] Foucault, "What is an Author?" 203

[77] Elsdon-Baker *The Selfish Genius* 2

telling title: *Richard Dawkins: How a Scientist Changed the Way We Think*[78], edited by Dawkins' former students, Alan Grafen and Mark Ridley, we find an example of the author-function as 'creative power': "We can think of no more fitting tribute to a figure so exactingly logical in science, so patiently lucid in promoting the public understanding of science, and so outspoken and clear-headed in the public sphere."[79] Here the establishing of the author-function is directed at the scientific qualities of Dawkins's work.

Daniel Dennett focuses on the philosophical qualities of Dawkins, thus creating a fundamentally different author-function:

> [Dawkins] is just as leery (sic) of idle armchair speculation and hypersnickety logic-chopping as any hard-bitten chemist or microbiologists ... My high opinion of his philosophical method is hard for me to separate, of course, with my deep agreement with the conclusions and proposals he arrives at.[80]

This quote illustrates not only the different constructions of the author-function, but also that the perception of the author will colour the reading in terms of what is found pertinent and representative, and what is excluded. Dennett here sees Dawkins as an eminent philosopher, but a construction of Dawkins as philosopher is not one-sided. Andrew Goatly performs a very different reading of the philosophical qualities of the author function:

> According to Dawkins' *The Selfish Gene* (1990) human behaviour can in fact be explained by the drive to pass on our genes ...
>
> Selfish gene theory has been developed into sophisticated mathematical models, in an attempt to explain, or explain away, altruistic behaviour. The theory quite clearly echoes the economic and political philosophies of Reaganism-Thatcherism (Chase-Dunn and Gills 2003).[81]

[78] Grafen, Alan and Mark Ridley (eds) *Richard Dawkins: How a Scientist changed the Way We Think,* Oxford University press, 2007 (2006)

[79] Ibid, Introduction xiii

[80] Dennett, Daniel: "The Selfish Gene as a Philosophical Essay", Grafen and Ridley 2007 (2006) 101-102

[81] Goatly, Andrew, *Washing the brain – Metaphor and Hidden Ideology* John Benjamin's Publishing Company 2007, 131

The author-function is here projected as a political figure. The phrase 'in an attempt to' illustrates that the perceived author-function represents the intention of the text. Therefore, the political meaning potential of the book is seen as representative of the author-function.

The above examples do not necessarily represent an exhaustive representation of the author-function that the readers project to the text, nor would I here evaluate their approximation to the 'real' Dawkins. Rather they illustrate how a depiction of an author-function is never exclusive or all-encompassing, but depends on the perspective from which one reads.

As mentioned above, part of the difficulties in reading Dawkins's works is to separate between the author-function and the bio-factual individual, due to the active first person voice that structures the texts. The separation is further complicated by Dawkins's use of his own person to modify and control potential meaning. In relation to the quote above, and as an answer to similar criticism, Dawkins writes in an end-note to the second edition of *The Selfish Gene*:

> I must add that the occasional political asides in this chapter make uncomfortable rereading for me in 1989. 'How many times must this [the need to restrain selfish greed to prevent the destruction of the whole group] have been said in recent years to the working people in Britain?' (p. 8) makes me sound like a Tory! In 1975, when this was written, a socialist government which I had helped to vote in was battling desperately against 23 per cent inflation, and was obviously concerned about high wage claims.[82]

While the immediate function of this quote is to modify and contextualize the meaning of one particular analogy to human society in the book, the more general effect is that Dawkins as an individual is proven not to hold the political stance that he is seen as representing. Therefore, potential readings are restricted, and Dawkins' personal vote and identity constitute the meaning-carrying guarantee. In consequence, the individual person, the author-function and

[82] *The Selfish Gene* 268

the first-person voice become intertwined, and the author can be said to contribute to his own designation.

Additionally, Dawkins also represents a strong public persona, probably in part due to his position as Charles Simonyi Professor for the Public Understanding of Science at Oxford University (1995-2008), and the founder of the Richard Dawkins Foundation for Reason and Science, and further because of his participation and creation of numerous popular TV-series on science, as well as his active role in public debate. As the above examples illustrate, Dawkins' author-function may, then, consist of a myriad of components, all of which contributes to what Foucault refers to as "a projection, in more or less psychologizing terms, of the operation that we force texts to undergo."[83] The different approaches to Dawkins' author-function, usually supported by quotes and references, underlines what Foucault refers to when he describes the proper name as "situated somewhere between description and designation."[84] The establishing of the author-function is descriptive in that it is supported by reference to other works by Dawkins, and designating in that it is, and must be, selective, particularly with regard to the range and variety of Dawkins's work.

In my reading, I will try to avoid making a projected author-function the determining structural element, as it would imply assigning an intention to the Dawkins of 1976 that was not necessarily present. In order to deal with this issue, I will, in my close reading, discuss the multiple voices in the book: The narrator, the meta-narrator and the authorial presence. While these voices are intertwined, and to some extent overlap, I still find this approach constructive, because they can be said to fulfil different functions. Furthermore, a focus on the literary elements of the text will allow a reading with a focus on 'what the text says about itself,' without disregarding the scientific content. The author-function, then, will be Dawkins

[83] Foucault, "What is an Author?" 203
[84] Ibid 200

The Writer, and I will not treat the active first person structuring the book as a direct expression of the individual. While I will pay heed to the intention of scientific communication, I will not aspire to represent the 'real' Dawkins. Rather, my reading represents one of several possible readings of *The Selfish Gene.* In the following, I will discuss a selection of readings focusing on different aspects of Dawkins's book.

1.2 Reading *The Selfish Gene*

The "operations that we force texts to undergo, the connections that we make, the traits that we establish as pertinent, the continuities that we recognize, or the exclusions that we practice"[85] are not only derived from the construction of an author-function; they are also a consequence of the reader's perspective. The question is then: are all readings equally valid and legitimate? And if not, which readings may be acknowledged as productive and which could be dismissed as irrelevant? These questions have been the core of the reception history of *The Selfish Gene*, and in the following I will discuss a selection of very different perspectives on the book in order to distinguish some of the problems connected to the issue of reading, or more importantly, of *mis*reading.

In 1979, Mary Midgley published an article entitled "Gene-Juggling,"[86] dealing with the philosophical implications of *The Selfish Gene*. Her critique is based on the philosopher J. L. Mackie's implementation of the selfish gene theory in a philosophical framework. The much quoted opening line is concerned with Dawkins' device of personifying genes: "Genes

[85] Foucault "What is an Author?" 203

[86] Midgley, Mary: "Gene-Juggling", in *Philosophy*, Vol. 54, No. 210, Cambridge University Press on Behalf of the Royal Institute of Philosophy, October 1979

cannot be selfish or unselfish, any more than atoms can be jealous, elephants abstract or biscuits teleological."[87] Midgley's criticism operates on two levels: on a linguistic level dealing with the function of models and metaphors, and on a philosophical level dealing with the over-arching normative implication of the metaphor of selfishness. Therefore, the article's perspective has been described as a *moral reading.* Midgley concentrates "on the moral consequences which Dawkins and Mackie draw."[88] Her central point is that Dawkins' book, by dealing with selfishness and altruism, is by definition and inevitably a philosophical work. Therefore, she argues, the philosophical and historical context of selfishness may not be ignored when it is established as a scientific metaphor.

On the level of metaphor, Midgley finds Dawkins's game-theoretic model, represented by the categories of 'Suckers,' 'Cheats' and 'Grudgers' "absurdly abstract,"[89] and questions the translatability of the model to real, complex life. Central to this criticism is the notion of consciousness and intention. The metaphor of gene-selfishness is seen as inadequate as explanation of behaviour, because it excludes intention from the scheme. The problem of intention starts not with the notion of selfishness, but with its fundament: the notion of competition: "In natural selection, many are born but few survive for long. We call this 'competition' and the metaphor at once suggests the specific *motive* of consciousness."[90] It is probably not necessary to note that competition is a well-established technical term in biology, but that is also why it is interesting that Midgley acknowledges its metaphoric quality. While competition may be seen as a neutral, scientific term, defined by technical use, it also has a metaphoric *potential* which can function as basis for an extended meaning. According to Midgley, this potential is the core of Dawkins' metaphor:

[87] Midgley, "Gene Juggling" 439
[88] Ibid 454
[89] Ibid 441
[90] Ibid 445 (Midgley's italics)

> It is natural for a reader to suppose that his over-simplified drama about genes is just a convenient stylistic device, because it seems obvious that the personification of them must just be a metaphor. Indeed he himself sometimes says it is so. But in fact this personification, in its literal sense, is essential for his whole contention; without it he is bankrupt. His central point is that the emotional nature of man is exclusively self-interested, and he argues this by claiming that all emotional nature is so.[91]

In the opening lines of Alan Grafen's "The Intellectual Contribution of *The Selfish Gene* to Evolutionary Theory"[92] the act of reading is to some extent reflected upon: "A phenomenon such as Dawkins' *The Selfish Gene* can be seen from many points of view and set in many contexts."[93] In spite of their difference in academic disciplines, (Grafen holds a professorship in Theoretical Biology and Midgley is professor of Philosophy,) the two readings to some extent share a point of departure:

> For my purposes, the core arguments of *The Selfish Gene* are (i) the introduction of the concept of a replicator, which allows what was then the most logically rigorous exposition of Darwin's theory of natural selection (ii) The link between replicator selection and selfishness, in a technical sense, and (iii) the suite of links that establish in turn each of the then new theoretical ideas in adaptationist biology in terms of the selection of replicators.[94]

The focus, particularly in the two first points of Grafen, is indirectly the same in the two texts, but the perspectives are fundamentally different. For Midgely, the notion of a replicator is an expression of

> the project of finding a unit which will serve for every kind of calculation involved in understanding evolution: a 'fundamental unit' at a deep level which will displace, and not just supplement all serious reference to individuals, groups, kin and species … Dawkins is not the only person to be impressed by the idea of a universal unit, but it is vacuous.[95]

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[91] Ibid 439

[92] Grafen, Alan "The Intellectual Contribution of *The Selfish Gene* to Evolutionary Theory", Grafen and Ridley, 2007 (2006)

[93] Ibid 66

[94] Ibid 66

[95] Midgley, "Gene-Juggling" 415

In Midgley's reading, the order of events is reversed compared to that of Grafen; the notion of selfishness is the main point that *The Selfish Gene* wants to communicate, and the concept of a replicator is only a means of rooting this concept in evolutionary biology: "[Dawkins] wants to relate the workings of natural selection in a simple and satisfying way to those of motivation by finding a single universal motive, and there is no such motive. Having picked on selfishness for this role, he personifies the gene in order to find an owner for it."[96] Midgley is concerned with motive as the constitutional element of the metaphor.

At this point the two texts part: Grafen is concerned only with selfishness in a technical sense[97] i.e. detached from its original meaning which presumes motive. Grafen's notion of gene-selfishness is fundamentally unproblematic:

> Linking selfishness to replicators, he argued that the entity concerned was the gene and the quantity that surviving genes would come through natural selection to act as if maximizing was their replication. This link between replicator dynamics on the one hand and selfishness on the other, brilliantly encompassed in the title of the book, is the very centre of Darwin's argument, but spelled out in a way that is more practical for further analysis …[98]

Selfishness in its technical sense is seen simply as an expression of the mechanism of natural selection. In this sense, Grafen's reading can be seen as an ideal reading, which filters the text and draws out only what may be read as objective facts:

> I am convinced that *The Selfish Gene* brought about a silent and almost immediate revolution in biology. The explanations made so much sense, the fundamental arguments were so clearly stated and derived so completely from first principles, that it was hard to see after reading the book how the world could ever have been any different … The very transparency of the exposition tended to make the book itself invisible within the newly created conceptual structure.[99]

Grafen recognizes a "transparency of exposition" in the book, diametrically opposed to Midgley's reading. Is the problem, then, that Midgley's reading is incompatible with a

[96] Ibid 446

[97] Grafen, "The Intellectual Contribution of *The Selfish Gene* to Evolutionary Theory" 66

[98] Ibid 67

[99] Grafen, "The Intellectual Contribution of *The Selfish Gene* to Evolutionary Theory" 72

scientific perspective simply because the problems it poses are irrelevant? Does she have too little knowledge of the first principles of evolution from which the book is derived? Is she simply *mis*reading Dawkins' book and missing the point? The de-complicating reading Grafen performs suggests so, and the claim is reinforced by the next article in the anthology, by Ullica Segerståle, professor in Sociology: "An Eye On the Core: Dawkins and Sociobiology."[100]

Segerstråle sees Dawkins elaboration of the gene's eye view as a "pedagogical tool for understanding such concepts as inclusive fitness and parental investment"[101] as well as a "heuristic device"[102] serving as "conceptual glue"[103]. It seems then as if a problematization of the metaphoric language must be a deliberate attempt of devaluing by now established scientific terms; a counter-productive contribution to the battle of the two cultures or the Science Wars, and this is indeed how Segerstråle depicts the criticism in her account of this kind of reading strategies:

> In relation to ... *The Selfish Gene* the critics employed a particular reading strategy which always yielded results (I have called this 'moral reading'). The aim was to imagine the worst possible social or moral implications of selected sentences in the book. These then justified condemnation.[104]

This statement illustrates of the antagonistic tone between the 'two cultures', and is a typical example of the construction of enemies and straw-targets on both sides that I have discussed above. The indignation, however, loses some of its edge when juxtaposed to Segerstråle's account of the theory of gene-level selection:

> This type of population genetic consideration of gene (allele) frequencies within populations drew attention away from the group and the individual to a new type of gene-selectionist thinking. What emerged was a fundamentally game-theoretical way

[100] Segerstråle, Ullica,"An Eye On the Core: Dawkins and Sociobiology" Grafen and Ridley 2007 (2006) 75-97
[101] Ibid 85
[102] Ibid
[103] Ibid
[104] Ibid

> of approaching behaviour where individuals (affected by their individual genes) appeared as strategists, calculating, as it were, the best way to behave in order to further their own inclusive fitness.[105]

This is the problem of intention that Midgley distinguishes, although here it functions on the level of the individual rather than on the level of the gene. The insertion of the self-conscious disclaimer 'as it were' illustrates the tension between the metaphorical language of intension and the ideal scientific reading. While the introduction of the paragraph suggests that the implied reader is at least somewhat familiar with the scientific jargon of gene-frequencies, game-theory and gene-selection, the aspect of motivation is put forward and disclaimed rather than simply replaced by a more suitable term: the element of intention is a necessary component of depicting the selfish gene theory. We can then draw the part conclusion that Midgley's reflections on the metaphorical quality of the technical language are not necessarily irrelevant, even from a scientific perspective.

This, however, does not solve the fundamental disagreement of *The Selfish Gene* presented in this section of my thesis, and indeed between a range of readings accumulated since the mid-twentieth century: the issue of anthropocentrism. Segerstråle's main concern in relation to the critics of (the sociobiological aspects of) Dawkins' book is this:

> It did not matter to the critics that, unlike Wilson, Dawkins did not try to include humans – humans appear in a separate last chapter, where memes (units of culture), not genes, are king. The political critics, set on finding fault with the book, blatantly ignored Dawkins' disclaimer that he with his title was describing a new way of looking at evolution, not exhorting humans to be selfish. In relation to ... *The Selfish Gene* the critics employed a particular reading strategy which always yielded results.[106]

I am now at the core of what some critics see as the fundamental misreading of *The Selfish*

[105] Ibid 83 (my italics)

[106] Ibid 85

Gene. In a review of Dawkins' second book *The Extended Phenotype* from 1982, John Maynard Smith[107] warns of exactly this, what may be seen as an anthropocentric projection to the text:

> *The Selfish Gene* reports no new facts. Nor does it contain any new mathematical models – indeed it contains no mathematics at all. What it does offer is a new world view.
>
> Although the book has been widely read and enjoyed, it has also aroused strong hostility. Much of this hostility arises, I believe, from misunderstanding, or rather, from several misunderstandings. Of these, the most fundamental is a failure to understand what the book is about. It is a book about the evolutionary process – it is *not* about morals, or about politics, or about the human sciences. If you are not interested in how evolution came about, and cannot conceive how anyone could be seriously concerned about anything other than human affairs, then do not read it: it will only make you needlessly angry.[108]

In the light of this account it seems that Midgley, by employing 'a particular reading strategy' has fallen into the trap of getting 'needlessly angry' and that her reading does not take into consideration that evolution is a natural process happening independently of man. Midgley is explicitly concerned with the "moral consequences that Dawkins ... draw[s]"[109]. Would it then have been wiser of Midgley not to have read *The Selfish Gene*, and keep to the 'soft sciences'? In order to further discuss the issue of anthropocentrism, I will turn to Richard Dawkins's comments of his text in his answer to Mary Midgley's criticism.

[107] John Maynard Smith is the originator of the concept of Evolutionary Stable Strategies

[108] Maynard, John Smith: "Genes and Memes" London Review of Books, Vol. 4, No 2 February 1982, 3

[109] Midgley, "Gene-Juggling" 454

1.3 The Writer as Reader and Critic

Mary Midgley's "Gene-Juggling" prompted an answer from Dawkins: "In Defence of Selfish Genes."[110] The polemic between the two writers illustrates the antagonistic tone of the debate that followed in the wake of the publication of *The Selfish Gene*. One interesting aspect of Dawkins' reply to Midgley is that the author can be said to perform a reading of his own book in order to counter her criticism. This particularly applies to the notion of selfishness, and Dawkins quotes a passage from *The Selfish Gene* in order to clarify the technical use of selfishness, i.e. how biologists use the term:

> An entity ... is said to be altruistic if it behaves in such a way as to increase another such entity's welfare at the expense of its own. Selfish behaviour has exactly the opposite effect. "Welfare" is defined as "chances of survival", even if the effect on actual life and death prospects is ... small ... It is important to realize that the above definitions of altruism and selfishness are behavioural, not subjective. I am not concerned here with the psychology of motives ... that is not what this book is about. My definition is concerned only with whether the effect of an act is to lower or raise the survival.[111]

This definition coheres with Grafen's view of 'selfishness in its technical sense' as discussed above. One question is still: how can the use of a technical term be so problematic for one reader, and so clear and unequivocal for another? Midgley is, after all, a philosopher of science, and not unfamiliar with words being redefined and used terminologically. This is also what becomes clear in her critique of the use of metaphor in science:

> Every metaphor suggests a model; indeed, a model is in itself a metaphor, *but one which has been carefully pruned.* Certain branches of it are safe; others are not and it is the first business of somebody who proposes a new model to make this distinction clear. Once this is done, the unusable parts of the original metaphor must be sharply avoided; it is no longer legitimate to use them simply as stylistic devices.[112]

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[110]Dawkins, Richard, "In Defence of Selfish Genes" 572-3 *Philosophy*, Vol. 56, No. 218 (Oct., 1981), Cambridge University Press on behalf of Royal Institute of Philosophy, http://www.jstor.org/stable/3750888

[111] Ibid 557 (Dawkins' abbreviation)

[112] Midgley "Gene-Juggling" 447 (Midgley's Italics)

The unusable parts of the original metaphor are here the connotations of consciousness and motivation that are connected to selfishness in its subjective meaning. This seems to concur with Dawkins' technical definition of selfishness: The metaphor of selfishness has been purged of motivation and intention. In this sense, selfishness is no longer a metaphor – it has become a part of the biological discourse. What, one might ask, then, is the problem? It looks as if Midgley has indeed misunderstood the meaning of selfishness as it is used in biological discourse, and Dawkins illuminates the misunderstanding:

> Midgley has a lot to say about metaphor, and I can end constructively by explaining why it was unnecessary for her to say it. She thought that I would defend my selfish genes by claiming that they were intended only as a metaphor, and assumed that I was speaking metaphorically when I wrote, 'We are survival machines- robot vehicles blindly programmed to preserve the selfish molecules known as genes. This is a truth which still fills me with astonishment' (*The Selfish Gene*, p. ix). But that was no metaphor. I believe it is the literal truth, provided certain key words are defined in the particular ways favoured by biologists.[113]

Dawkins's answer disregards the important structural element of personification of genes and vehicles. In *The Selfish Gene*, selfishness is used simultaneously in two different meanings. On the one hand, it is used in its technical sense:

> There was a struggle for existence among replicator varieties. They did not know they were struggling ... but they were struggling in the sense that any mis-copying that resulted in a higher level of stability, or a new way of reducing the stability of rivals, was automatically preserved and multiplied.[114]

On the other, it is used metaphorically in the personification of genes and vehicles:

> If one parent can get away with investing less than his or her fair share of costly resources in each child, however, he will be better off, since he will have more to spend on other children by other sexual partners, and so propagate more of his genes. Each partner can therefore be thought of as trying to exploit the other, trying to force the other one into investing more.[115]

[113] Dawkins "In Defence of Selfish Genes" 572

[114] *The Selfish Gene* 19

[115] Ibid 140

It is, according to Midgley, this juxtaposition of the technical and the colloquial definition of selfishness that confuses the meaning. By presenting selfishness as merely a technical term, Dawkins avoids Midgley's critique of the importance of 'purging the metaphor'. The juxtaposition of the technical and the subjective meaning of selfishness potentially makes reading *The Selfish Gene* quite a slippery slope, since it is up to the reader to make out when the term is used technically and when it is used metaphorically.

This challenge of distinguishing between a technical and metaphorical language is only one aspect of a more general problem, the question: What is the central message of *The Selfish Gene*? Midgley defines it like this: "His central point is that the emotional nature of man is exclusively self-interested, and he argues this by claiming that all emotional nature is so"[116]. Dawkins' reply to this is:

> Midgley raises the art of misunderstanding to dizzy heights. My central point had no connection with what she alleges. I am not even very directly interested in man, or at least not in his emotional nature. My book is about the evolution of life, not the ethics of one particular, rather aberrant, species.[117]

Apparently, *The Selfish Gene* concerns natural phenomena in general of which human is part, and not man in particular. I have discussed above how readings of *The Selfish Gene* differs in the approach to man. What I have not as yet touched upon, is Dawkins' approach to this issue. As it appears from the above quote, Dawkins' pays man only marginal interest. Midgley's misunderstanding, then, would be the act of performing an anthropocentric reading of an evolutionary text. This apparent misreading echoes the problems that Darwin faced when the *Origin* was published in 1859. Gillian Beer, in her work *Darwin's Plots* observes: "However much Darwin may have represented to himself and his correspondents the absence of man as a matter of diplomatic restraint, the exclusion had an immediate polemical effect: it removed

[116] Dawkins "In Defence of Selfish Genes" 439
[117] Ibid 556

man from the centre of attention. An act of will by the reader was required to restore him to centrality."[118]

Similarly, while more explicitly referring to man as a part of a narrative from the gene's eye point of view, Dawkins writes: "We are survival machines, but 'we' does not mean just people. It embraces all animals, plants bacteria and viruses"[119]. Here, man is seen as equal to any other entity carrying replicators. In a biological context, it might well be prudent to treat human simply as body, on equal footing with other bodies. Therefore, it may also be a misreading to re-situate man to the centre of attention if this is indeed a narrative of the gene. This assumption is apparently supported by the introduction to the last chapter in the first edition, dealing with memes:

> So far, I have not talked much about man in particular, though I have not deliberately excluded him either. Part of the reason I have used the term 'survival machines' is that 'animal' would have left out plants and, in some people's minds, humans. The arguments I have put forth should, prima facie, apply to any evolved being.[120]

Rather than excluding man, like Darwin did, Dawkins explicitly includes him in the evolutionary narrative. Implicit in this summary of the central message, is the restriction imposed upon the reader not to place man at the centre of attention. One might argue that such a restriction is legitimate and even necessary in a popularized text dealing with evolutionary biology. However, the question then arises whether the text itself can be said to adhere to the restrictions imposed by the narrator, or by the author, by his claim not to be interested in man.[121] I would argue that Dawkins does in fact invite an anthropocentric reading. In the first chapter, "Why are People?" a central point of the book is presented:

> My purpose is to examine the biology of selfishness and altruism.

[118] Beer *Darwin's Plots* 54
[119] *The Selfish Gene* 22
[120] Ibid 189
[121] Dawkins, "In Defence of Selfish Genes" 556

> Apart from its academic interest, the human importance of this subject is obvious. It touches every aspect of our social lives, our loving and hating, fighting and cooperating, giving and stealing, our greed and our generosity.[122]

This introductory presentation of the book makes the demand of reading it as an evolutionary and not as an anthropological narrative seem unreasonable. This impression is further reinforced by statements such as the following: "Let us try to *teach* generosity and altruism, because we are born selfish."[123] In light of these examples, Mary Midgley can hardly be accused of 'raising the art of misunderstanding to dizzy heights'[124] when she claims that man's emotional nature is a central point of *The Selfish Gene*. While, as Beer remarked above, an anthropocentric reading of *The Origin* required an act of will on the part of the reader,[125] *The Selfish Gene* requires an effort on the part of the reader to read man *out* of the narrative, and explicitly so. In the Preface to the 30th Anniversary edition, published in 2006, Dawkins responds to criticisms, and reflects upon what he describes as the misunderstandings of the concept of selfishness:

> I do with hindsight notice lapses of my own on the very same issues. These are to be found especially in Chapter 1, epitomised by the sentence 'Let us try to teach generosity and altruism because we are born selfish'. There is nothing wrong with teaching generosity and altruism, but 'born selfish' is misleading. In partial explanation, it was not until 1978 that I began to think clearly about the distinction between 'vehicles' (usually organisms) and the 'replicators' that ride inside them (in practice genes ...). Please mentally delete that rogue sentence and others like it, and substitute something along the lines of this paragraph.[126]

The last sentence in this paragraph puts a remarkable responsibility on the reader, while also assigning her a submissive role. The reader is expected to read in accordance with an underlying message behind the words – the intended meaning – and hence invoke the scientifically prudent contents of the text. Moreover, it is not clear what exactly it means to

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[122] *The Selfish Gene* 1-2

[123] Ibid 3

[124] Dawkins, "In Defence of Selfish Genes" 556

[125] Beer *Darwin's Plots* 54

[126] *The Selfish Gene* ix

'mentally delete rogue sentences'. One problem is how a lay-reader is to evaluate whether or not a claim or statement is in fact inappropriate in a scientific text. Should she mentally delete all claims or statements that may seem ambiguous, and if so, would that not involve checking any attempt at critical reading? Again, the juxtaposition of the technical and metaphorical meaning of selfishness makes reading hazardous. The plea to mentally delete rogue sentences, then, seems to function mainly as a safeguard against criticism, rather than as an illuminating modification. If 'rogue sentences' are all statements that go beyond the usual object of biological research and trespass into the area of philosophy, the plea is to the good-humoured reader to be overbearing with the escapades of an overly enthusiastic, young writer who has let himself be carried away by the excitement of new ideas. The preface to the second edition of *The Selfish Gene* supports this interpretation:

> I wrote *The Selfish Gene* in something resembling a fever of excitement.
>
> When Oxford University Press approached me for a second edition, they insisted that a conventional, comprehensive, page by page revision was inappropriate. There are some books that, from their conception, are obviously destined for a string of editions, and *The Selfish Gene* was not one of them. The first edition borrowed a youthful quality from the times in which it was written. There was a whiff of revolution abroad, a streak of Wordsworth's blissful dawn. A pity to change a child of those times, fatten it with new facts or wrinkle it with complications and cautions. So, the original text should stand, warts, sexist pronouns and all. Notes at the end would cover corrections, responses and developments.[127]

The book, according to Dawkins, has historical value as a testimony of science in progress – "a child of those times". Also, artistic considerations seem to have had an effect on the decision not to revise it, or "fatten it with new facts and wrinkle it with complications and cautions" – the youthful hubris of a young author writing in "a fever of excitement" should be preserved and indulged. In consequence, criticism can be made to look like expressions of spitefulness, and unwillingness to read the book sympathetically and in accordance with what

[127] *The Selfish Gene* xvii

is *meant.* One problem here is, however, that it is not always an easy task to decipher what exactly *is* meant.

Dawkins remarks above give the impression that the lack of revision is of minor importance. Contrary to this assertion, it is my argument that the end notes, which as well as covering "corrections, responses and developments"[128] also contain several modifications, contribute to complicating the text. In this web of claims and disclaimers, getting a coherent overview requires quite an effort, resulting in the somewhat paradoxical situation that the text simultaneously demands a quite sophisticated reading and discourages criticism. The latter is of importance with regard to the influence the book has had both in professional circles and through its broad readership. When criticism is dismissed and trivialized, the author claims a power of definition that I find particularly unfortunate considering the book's influential status. For instance, the notion of selfishness is presented as problematic only because it is seen as a misunderstanding or as a failure to understand the book: "Many critics, especially vociferous ones learned in philosophy as I have discovered, prefer to read the book by title only … I can readily see that *The Selfish Gene* on its own, without the large footnote of the book itself, might give an inadequate impression of its contents"[129]. However, the book is not entirely uncomplicated reading, nor is the concept of selfishness, as becomes clear with the notion of *poetic science*.

In his work *Unweaving the Rainbow*,[130] first published in 1998, Dawkins introduces the concept 'poetic science': "It is the central tenet of this book that science, at its best, should leave room for poetry. It should note helpful analogies and metaphors that stimulate the imagination, conjure in the mind images and allusions that go beyond the needs of

[128] *The Selfish Gene* xvii

[129] Ibid viii

[130] Dawkins, Richard, *Unweaving the Rainbow: Science, Delusion and the Appetite for Wonder* Penguin Group, London, 2006 (1998)

straightforward understanding"[131]. Poetic science, then, is not only a matter of heuristic explanation, but may address the reader on a personal level. In the preface to *The Blind Watchmaker,*[132] Dawkins elaborates this function of poetic science:

> Explaining is a difficult art. You can explain something so that your reader understands the words; and you can explain something so that the reader feels it in the marrow of his bones. To do the latter, it sometimes isn't enough to lay the evidence before the reader in a dispassionate way. You have to become an advocate and use the tricks of the advocate's trade.[133]

One quality of poetic science is apparently the ability to appeal to the emotions of the reader: to provoke an emotional response. I will explore the consequences of this appeal to the subjective consciousness in my close reading in the next chapter of this thesis. The concept of poetic science does not, however, only concern the reader and her meeting with the text. It is also a matter of language's influence on the scientific process. In one of his prefaces to *The Selfish Gene,* Dawkins elaborates on the power of metaphor as a scientific tool:

> [I] prefer not to make a clear distinction between science and its 'popularization'. Expounding ideas that have hitherto appeared only in the technical literature is a difficult art. It requires insightful new twists of language and revealing metaphors. If you push novelty of language and metaphor far enough, you can end up with a new way of seeing. And a new way of seeing, as I have just argued, can in its own right make an original contribution to science. Einstein himself was no mean popularizer, and I have often suspected that his vivid metaphors did more than just help the rest of us. Didn't they also fuel his creative genius?[134]

Language as a means for inducing new ways of seeing is here considered a creative resource, but it may also be seductive:

> But there's bad poetry as well as good, and bad poetic science can lead the imagination along false trails. That danger is the subject of this chapter. By bad poetic science I mean something other than incompetent or graceless writing. I am talking about almost the opposite: about the power of poetic imagination to inspire bad

[131] Dawkins, *Unweaving the Rainbow* 2006 (1998) 180

[132] Dawkins, Richard, *The Blind Watchmaker*, Penguin Group, England, 2006 (1986)

[133] Ibid xvii

[134] *The Selfish Gene* xvi

> science, even if it is good poetry, perhaps especially if it is good poetry, for that gives the greater power to mislead.[135]

Again, bad poetic science may influence the writer as well as the reader of poetic science. In *Unweaving the Rainbow*, an author is described as "drunk on metaphor"[136], while another example concerns a group of professional scientists who, Dawkins demonstrates, have been misled by bad poetic science and he asks: "If [highly competent professional scientists] can be seduced by bad poetic science, what chance has the non-specialist?"[137]

In contrast, Dawkins refers to *The Selfish Gene*, and the concept of selfishness:

> It is now widely understood that altruism at the level of the individual organism can be a means by which the underlying genes maximize their self interest … What I would now re-emphasize from the book – it has been overlooked by critics who appear to have read it by title only – is the important sense in which genes, though in one way purely selfish, at the same time enter into cooperative cartels with each other. This is poetic science, if you like, but I hope to show that it is good poetic science which aids understanding rather than impedes it.[138]

Gene selfishness and genetic agency , within the framework of poetic science, is promoted as an illuminating device aiding understanding, both, presumably, as a creative force driving the selfish gene theory, and as a means of making scientific knowledge more accessible through personification. Furthermore it seems that an understanding of selfish genes requires a deeper understanding of the structures of language; selfishness is not an absolute entity. The importance of reflexivity towards language's inherent structures is elaborated in the depiction of "one of the most egregious forms of bad poetic science"[139]:

> I refer to the idea that there is a simple opposition between nasty and nice, social and antisocial, selfish and altruistic, tough and gentle; and that these pairs of binary oppositions all correspond to other pairs, and that the history of evolutionary controversy is described as a pendulum swinging back and forth along a continuum between these opposites … I am criticizing the idea that there is a single continuum

[135] Dawkins *Unweaving the Rainbow* 180
[136] Ibid 187
[137] Ibid
[138] Ibid 212-213
[139] Ibid 210

> and that worthwhile arguments are to be had between the vantage points along its length.[140]

This observation particularly concerns the tendency of unspecified actors "hijacking nature as a source of moral tales."[141] Compared to the logocentric definition that Dawkins applied in his reply to Midgley in 1981: "An entity ... is said to be altruistic if it behaves in such a way as to increase another such entity's welfare at the expense of its own. Selfish behaviour has exactly the opposite effect"[142] the development of gene selfishness has come a long way when it is written into the terms of poetic science in 1998. Interestingly, the rationale for interpretation of selfish genes is now almost the opposite: rather than accepting a univocal, technical definition of selfishness, the reader needs to destabilize the dichotomy of selfishness ≠ altruism in order to understand how it functions in *The Selfish Gene*. Ironically, this approach concurs with the reading techniques of structural analysis known from deconstructive theory.

With the introduction of poetic science, Dawkins can be said to perform literary criticism of other works, as well as providing a structural framework from which *The Selfish Gene* should be read. This is not to say that the reader is obligated to adhere to this framework – a text may, of course carry meaning beyond that of the author's intentions. The construction of a platform of literary criticism, does, however, indicate the high level of reflexivity in the Dawkins's writings, and opens for other literary approaches to *The Selfish Gene*.

In the following chapter, I will examine the function and the effect of the textual strategy of personification, as well as the conceptualization of the gene and its narrative structure.

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[140] Ibid

[141] Ibid

[142] *The Selfish Gene* 4

2: The Language of Convenience and Displaced Agency in *The Selfish Gene*

> Am I in earnest? Oh dear no! Don't you know
> that this is a fairy tale, and all fun and pretence;
> and that you are not to believe one word of it,
> even if it is true?[143]

> Really, universally, relations stop nowhere
> and the exquisite problem of the artist is
> eternally but to draw by a geometry of his
> own, the circle in which they shall happily
> *appear* to do so.[144]

2.1 The Language of Convenience

The conflict concerning whether selfishness should be regarded as a technical or metaphorical term, as the shown in the debate between Dawkins and Midgley above, originates from the fundamental structural device of personification in *The Selfish Gene*, explicitly described by the narrator as the language of convenience: "In practice it is usually convenient, as an approximation, to regard the individual body as an agent 'trying' to increase the numbers of all its genes in future generations. I shall use the language of convenience."[145] This particular example refers to the organism, i.e. the body, but the language of convenience is employed on several levels, and appears in a variety of forms. The gene may be portrayed as a conscious actor: "The lion genes 'want' the meat as food for their survival machine. The antelope genes

[143] Kingsley, Charles, *The Waterbabies* (1862-1863), Penguin Group, New York, 2008 43

[144] James, Henry, from the original preface to *Roderick Hudson* (1875) "The Preface to the New York Edition" by Geoffrey Moore, Penguin Group, London, 1986 37 (Author's Italics)

[145] *The Selfish Gene* 47

want the meat as working muscle and organs for their survival machine."[146] The metaphorical meaning is sometimes, but not always, conveyed by the use of inverted commas. A second form of gene-level personification is the depiction of genetic instructions written out in English language: "The possessor of an altruistic gene might be recognized simply by the fact that he does altruistic acts. A gene could prosper in the gene pool if it 'said' the equivalent of: 'Body, if *A* is drowning as a result of trying to save someone else from drowning, jump in and rescue *A*.'"[147] The language of convenience is also applied to individual bodies, i.e. survival machines, either in the form of inherent intention: "Ideally, what an individual would 'like' (I don't mean physically enjoy, although he might) would be to copulate with as many members of the opposite sex as possible, leaving the partner in each case to bring up the children,"[148] or written out in what the narrator refers to as soliloquy:

> If I start a fight, I am just as likely to end up dead as he is. Perhaps even more so. He holds a valuable resource, that is why I want to fight him. But why does he hold it? Perhaps he won it in combat. He has probably beaten of other challengers before me. He is probably a good fighter. Even if I win the fight and gain the harem, I may be so badly mauled in the process that I cannot enjoy the benefits. Also, fighting uses up time and energy.[149]

The soliloquy contributes to the literary, readable style, and emphasises the portrayal of evolution as a drama taking place in nature. In this sense, the language of convenience serves a stylistic purpose: "At times, gene language gets a bit tedious, and for brevity and vividness we shall lapse into metaphor."[150] Brevity and vividness can be distinguished as genre features of the genre of popular, or public, science. The stylistic effect is, however, only one of a variety of functions that the language of convenience fills. One significant function is that of substituting for mathematical calculation, particularly with regard to evolutionarily stable

[146] Ibid 83
[147] Ibid 89
[148] Ibid 140
[149] Ibid 68
[150] Ibid 45

strategies (ESS), which is the central tenet of the book: "This subjective soliloquy is just a way of pointing out that the decision whether or not to fight should ideally be preceded by a complex, if unconscious 'cost-benefit' calculation."[151] The metaphor of personification, according to the preface to the 30th Anniversary Edition functions as "verbal equivalents of mathematical calculations"[152]:

> When a man throws a ball high in the air and catches it again he behaves as if he had solved a set of differential equations in predicting the trajectory of the ball. He may never know or care what a differential equation is, but this does not affect his skill with the ball. At some subconscious level, something functionally equivalent to the mathematical calculations is going on.[153]

The mathematical calculations that the language of convenience represents, then, take place independently of intension, consciousness and mathematical abilities: In order to catch the ball, the man must predict how the ball is going to move and where it is going to land, an unconscious prediction which is equivalent to that of mathematical calculation. Hence, the language of convenience may be regarded as technical terminology, calling for a purely scientific reading such as that of Grafen in 2.2 in this thesis. The fundamental difference between mathematical calculation and its verbal equivalent is that the verbal expression requires a grammatical agent. Gillian Beer, in her book *Darwin's Plots*, distinguishes some fundamental problems of writing out the faceless event of evolution in language: "First, language is anthropocentric. It places man at the centre of signification ... Second, language always includes agency, and agency and intention are frequently impossible to distinguish in language."[154] I will discuss the latter problem first: Language is always imbued with intention, and this is a problem that must be tackled by the writer of evolutionary history. Whereas the dominant grammatical agent of *The Origin* is natural selection, well established in today's

[151] Ibid 69
[152] Ibid xxi
[153] Ibid 96
[154] Beer *Darwin's Plots* 47-8

evolutionary discourse, the agent of *The Selfish Gene* is at times the survival machine, and at times the gene, but it is the gene that is the protagonist of the drama, and it is always the implicit agent, for reasons that will become clear further down in this chapter. While Darwin, through numerous editions of *The Origin*, struggled to wrest will and intention out of the language of evolution and thus to "write against the grain of language,"[155] the language of convenience makes will and intention the driving force of the argumentation of *The Selfish Gene*. The intention-imbued language can be said to render the representation more Lamarckian than Darwinian.

Jean-Baptiste Lamarck (1744-1829) is famously known for proposing that the giraffe's neck was made longer through generations by its constant stretching to reach the top leaves as the environment changed and trees grew taller.[156] As Beer observes:

> *Intention* is the key to Lamarck's concepts, and [he] proposes a world of intelligent desire rationally satisfied ... It gave primacy to the mind – to intention, habit, memory, a reasoned inheritance from generation to generation in which need engendered solution and solution could be genetically preserved by means of an act of will, rendered independent of consciousness as habit.[157]

Intention features as an instrument of representation in *The Selfish Gene*, consequentially re-introducing intention to the technical term of selfishness. Instead of purging language of its metaphorical quality, a reflexive narrator steps in and modifies the notion of conscious intention: "It is important to realize that we are not thinking of the strategy as being consciously worked out by the individual. Remember that we are picturing the body as a robot survival machine with a pre-programmed computer controlling the muscles."[158] Thus, the reader's attention is drawn to the metaphoric quality of the language of convenience: "At times, gene language gets a bit tedious, and for brevity and vividness we shall lapse into

[155] Ibid 3
[156] http://evolution.berkeley.edu/evolibrary/article/history_09
[157] Beer *Darwin's Plots* 20
[158] *The Selfish Gene* 69

metaphor. But we shall always keep a sceptical eye on our metaphors, to make sure they can be translated back into gene language if necessary."[159] Hence, the reader is put in the peculiar position of accepting the appeal to the rational consciousness, all the while dismissing the same notion. In this sense, one might say that the reader is held responsible for purging or purifying the meaning of the metaphor, rather than the text working to free itself from the connotation of intention. Because the as-if calculation is written out as personification rather than in terms of similes, the hypothetical quality of 'as if' is implied rather than explicitly worked into the language – as in the example of the man with the ball. As a result, the text requires a doubleness of reading – a plea to the reader to *read* against the grain of language, thus liberating the writer from the struggles with language. Gene language – the language which the metaphorical language of convenience represents – is at times invoked: "I have made the simplifying assumption that the individual animal works out what is best for its genes. What really happens is that the gene pool becomes filled with genes that influence bodies in such a way that they behave as if they had made these calculations."[160] Here the gene is the grammatical agent, but not a conscious actor. The effect of the language of convenience, particularly when juxtaposed to gene language, is that it induces a suspension of disbelief on the part of the reader. The willed suspension of disbelief and the readiness to enter into the imaginative sphere of representation is consolidated by the reassuring narrator:

> But of course we do not have to think of the animals as making calculations consciously. All we have to believe is that those individuals whose genes build brains in such a way that they tend to gamble correctly are as a direct result more likely to survive, and therefore to propagate those same genes.[161]

The doubleness of accepting and not accepting the language of convenience, along with the willed suspension of disbelief, requires on the one hand a somewhat sympathetic reading.

[159] Ibid 45
[160] Ibid 97
[161] Ibid 56

Moreover, it engages the reader in an imaginative reading which is usually associated with fiction rather than scientific works. Rather than being concerned with natural events taking place outside of language, the reader becomes engaged in an imaginative reading, which in turn opens for a subjective experience in the encounter with the text.

This brings me to the other challenge that Beer distinguishes in writing out evolutionary history: that language is anthropocentric. In 1.3 above, I claimed that, in contrast to the readers of *The Origin*, the reader of *The Selfish Gene* must make an effort to read man *out* of the narrative, and that Dawkins's mode of writing invites an anthropocentric reading. Rather than refusing the anthropocentric connotations of language, the language of convenience makes use of these connotations: "Since you and I are humans who know what it is like to have conscious purposes, it is convenient for me to use the language of purpose as a metaphor in explaining the behaviour of survival machines"[162] – the anthropocentric language serves the purpose of recognition and identification, and the narrator muses on the anthropocentric tendencies of man:

> When we watch an animal 'searching' for food, or for a mate, or for a lost child, we can hardly help imputing to it some of the subjective feelings that we ourselves experience when we search. These may include 'desire' for some object, a 'mental picture' of the desired object, an 'aim' or 'end in view'. Each one of us knows, from the evidence of our own introspection, that, at least in our modern survival machine, this purposiveness has evolved the property we call 'consciousnesses'. I am not philosopher enough to discuss what this means, but fortunately, it does not matter for our present purposes because it is easy to talk about machines *as if* motivated by a purpose, and to leave open the question whether they actually are conscious.[163]

The as-if constructions make it possible, as does the motivating aspect of rational intention in Lamarck, to make language independent of consciousness while drawing on the tendency of man to project intention and identification onto our surroundings, and thus open for an intuitive understanding of natural processes. Importantly, the technical function of translating

[162] Ibid 123
[163] Ibid 50

mathematical calculations is juxtaposed and intertwined with the function of making possible an intuitive understanding. Opening the door to human psychology, the intuitive understanding gains an uncanny quality when the language of convenience is projected back to man from the point of view of the gene: "'Here is a list of things defined as rewarding: sweet taste in the mouth, orgasm, mild temperature, smiling child. And here is a list of nasty things: various sorts of pain, nausea, empty stomach, screaming child'."[164] All of the examples address emotions, the Not-Thought – taste, orgasm and pain cannot be verbalized other than in terms of personal experience, and hence, the scientific book moves into the domain of the subjective. The uncanny effect makes itself even more strongly felt when juxtaposed to the detached, disinterested function of ideal calculations: "This subjective soliloquy is just a way of pointing out that the decision whether or not to fight should ideally be preceded by a complex, if unconscious 'cost-benefit' calculation."[165] The language of convenience as a technical device is, as I have demonstrated, intertwined with the uncanny effect of identification, also when it is used as verbal expression of genetic information, in the form of instructions posed by the gene to the brain. In order to further investigate the effects of this structure, I will in the following turn to the conceptualization of the gene in *The Selfish Gene*, and its scientific implications.

[164] Ibid 57
[165] Ibid 69

2.2. Poetic Science and the Conceptualization of the Gene

The gene's eye point of view does not originate from Dawkins:

> The gene's eye view of Darwinism is implicit in the writings of R. A. Fisher and the other great pioneers of Neo-Darwinism in the early thirties, but was made explicit by W. D. Hamilton and G. C. Williams in the sixties.[166]

However, as Dawkins develops the notion of selfish genes, he invokes a particular definition, based on abstraction:

> I am using the word gene to mean a genetic unit that is small enough to last for a large number of generations and to be distributed around in the form of many copies. This is not a rigid all-or-nothing definition, but a kind of fading-out-definition, like the definition of 'big' or 'old'. The more likely a length of chromosome is to be split by crossing-over, or altered by mutations of various kinds, the less it qualifies to be called a gene in the sense in which I am using them.[167]

Hence, the selfish gene does not refer to a specific material object, but rather to a stable set of molecules. This definition does not represent the geneticist definition of a gene, because it is concerned with its copying-ability rather than its composition. The problem is sometimes avoided by the term 'replicator', which is used interchangeably with that of 'gene', and the gene definition is referred to as a "unity of convenience"[168] – a construction upon which the theory can be developed. The liberty of definition makes possible a "new way of seeing,"[169] which in turn is a requirement for 'good poetic science'[170]

> My definition will not be to everyone's taste, but there is no universally agreed definition of a gene. Even if there were, there is nothing sacred about definitions. We can define a word how we like for our own purposes, provided we do so clearly and unambiguously.[171]

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[166] Ibid xvi
[167] Ibid 34
[168] Ibid 195
[169] Ibid xvi
[170] See 2.3 in this thesis
[171] *The Selfish Gene* 28

The selective but 'clear and unambiguous' definition furthermore fulfils the requirement of poetic science to clarify and illuminate rather than to confuse the issue. Kim Sterelny comments on the effectiveness of the gene-conceptualization: "The molecular biology of genes – the chemical details of their action, interaction and reproduction – is alarmingly complex. But fortunately, Dawkins does not allow himself to be bogged down in these details, and we can follow his lead."[172] Rather than spending time and space on genetic definition, the book can go straight to its real issue of genetic effects:

> On any sensible view of the matter, Darwinian selection does not work on genes directly. DNA is cocooned in the protein, swaddled in membranes, shielded from the world and invisible to natural selection. If selection tried to choose DNA molecules directly it would hardly find any criterion by which to do so. All genes look alike, just as all recording tapes look alike. The important differences between genes emerge only in their *effects*.[173]

The analogy of recording tapes illustrates the conception of information. Treating DNA as information is a scientific convention:

> DNA can be regarded as a set of instructions for how to make a body, written in the *A*, *T*, *C*, *G*, alphabet of the nucleotides … The coded message of the DNA, written in the four letter nucleotide alphabet, is translated in a simple mechanical way into another alphabet. This is the alphabet of amino acids which spells out protein molecules.[174]

James R. Griesemer, in his article "The Informational Gene and the Substantial Body: On the Generalization of Evolutionary Theory by Abstraction"[175] writes: "Information provided a useful interpretive frame for working out aspects of the genetic code in the 1960s (at the dawn of the 'information age')."[176] The conceptualization of genes as information, too, can be read

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[172] Sterelny, Kim, *Dawkins vs. Gould*, Icon Books Ltd, 2007 (2001)
[173] *The Selfish Gene* 235 (Dawkins' italics)
[174] Ibid 22-23
[175] Griesemer, James: "The Informational Gene and the Substantial Body: On the Generalization of Evolutionary Theory by Abstraction", Poznan Studies in the Philosophy of the sciences and the Humanities, Idealization XII: Correcting the Model, eds. Jones R. Martin and Cartwright, Nancy, Rodopi, 2005, 59-116
[176] Ibid 60

into Dawkins' notion of poetic science, where abstraction and the invention of new concepts provide a productive framework for further research.

In *The Selfish Gene* the convention of DNA as information is taken to its literal extreme with the language of convenience:

> It is important to realize that we are not thinking of the strategy as being consciously worked out by the individual. Remember that we are picturing the body as a robot survival machine with a pre-programmed computer controlling the muscles. To write out a set of simple instructions in English is just a convenient way for us to think about it. By some unspecified mechanism, the animal behaves as if he were following these instructions.[177]

The 'set of simple instructions' is rooted in the alphabet of DNA, and translated into the alphabet of amino acids. In this sense, the gene-instructions could be seen as verbal expression of the coded messages, much in the same sense as the as if personification is treated as a verbal equivalent of mathematical calculations. While this structural device is effective in communicating the central idea of gene-level selection, and provides its rationale, the information concept also has a reciprocal effect on the gene-concept:

> the more seriously one takes information, the more likely one is to deny that evolution happens at any level other than that of the gene. If one takes information too seriously, it can even come to replace the molecular concept of the gene altogether. The result is a theory that genes *are* evolutionary information.[178]

One might argue that the notion of gene as information is legitimate for biological purposes, which are not concerned with the genotypic composition, but with its effect – the physical realization of the genotype, i.e. the phenotype, as explained in a research paper published in 2004: "The purpose of the evolutionary gene concept is to abstract away from the complexities of the gene-phenotype relationship."[179] Rheinberger and Müller-Wille in the

[177] *The Selfish Gene* 69

[178] Griesemer "The Informational Gene and the Substantial Body" 60-61, 2005 (Griesemer's italics)

[179] Stotz, Karola, Paul Griffith and Rob Knight "How Biologists Conceptualize Genes: an Empirical Study", *Studies in History and Philosophy of Biological and Biomedical Sciences*, Elsevier Journals, Vol. 35, issue 4, December 2004 9

article "Gene"[180] explain the motivation for the biological conceptualization of the gene: the "evolutionary gene had to result in or had to be correlated with some phenotypic difference that could be "seen" or targeted by selection."[181] The phenotypic difference that *The Selfish Gene* is concerned with is mainly behaviour. The verbalized gene instructions make possible the portrayal of a linear transition of genetic information resulting in a specific behaviour. However, the notion of translating the genetic event into verbal language is not unproblematic: "the ability to describe changes in the composition of the genome after the fact is not the same as the ability to explain or predict those changes."[182] The language of convenience, then, anticipates the genetic event, and functions as a post-rationalization of the phenotype as automatic realization of the genotype. This reversal of interpretation: phenotype as evidence for genome rather than genetic changes linked to changes in phenotype is evident in statements like: "The possessor of an altruistic gene might be recognized simply by the fact that he does altruistic acts."[183]

Dawkins has been accused of advocating a deterministic approach to genetic biology. In light of the gene conception and the genotype-phenotype relationship, this seems understandable; if all behaviour is by definition expressions of genetic manipulation, then genes do indeed determine all aspects of life, also human, and the notion of free will is an illusion. Within this paradigm, gene selfishness would inescapably imply that all behaviour, including the human, were selfish. The deterministic approach is, however, refuted in a note to the second edition of *The Selfish Gene*:

> [Some critics], perhaps because they read the book by title only or never made it past the first two pages, have thought that I was saying that, whether we like it or not, selfishness and other nasty ways are an inescapable part of our nature. This error is easy to fall into if you think, as many people unaccountably seem to, that genetic

[180] Rheinberger, Hans-Jörg and Staffan Müller-Wille, "Gene", 2009 (2004) http://plato.stanford.edu/archives/spr2010/entries/gene/
[181] *The Selfish Gene* 13
[182] Stotz, Griffiths, Knight, "How Biologists Conceptualize Genes" 11
[183] *The Selfish Gene* 89

> ‘determination’ is for keeps – absolute and irreversible. In fact genes ‘determine’ behaviour only in a statistical sense … We don’t see red sunsets as irrevocably determining fine weather the next day, and no more should we think of genes as irrevocably determining anything. There is no reason why the influence of genes cannot easily be reversed by other influences.[184]

In order to take this modification of the selfish gene theory into consideration, the reader must (in addition to deleting the ‘rogue sentences’ discussed in 1.3 in this thesis) apply a reading in terms of poetic science, or even in terms of ‘science fiction’. To read this aspect of the book as poetic science would be to emphasize the hypothetical nature of the theory, and to acknowledge it only as a potential and more or less probable truth. The statement “the possessor of an altruistic gene might be recognized simply by the fact that he does altruistic acts”[185] would then be true only within the imaginary universe of the text. As mentioned, the gene’s eye point of view does not originate from Dawkins, but it is in *The Selfish Gene* that the gene’s eye point of view is played out and “in the process Dawkins’ heuristic device becomes a conceptual glue for keeping the core ideas of sociobiology together.”[186] How, then, is this conceptual glue structured, and to what effect? In the following, I will discuss the narrative structure of the story of selfish genes.

[184] Ibid 267-8
[185] Ibid 89
[186] Segerstråle, “An Eye on the Core” 85

2.3 The Narrative of Nature

Katherine N. Hayles observes that "Dawkins, a skilful rhetorician keenly aware of the value of a good story, nevertheless espouses what might be called the giftwrap model of language," which "claims it is merely a wrapper for what lies within,"[187] an observation that to some extent coheres with the scientific readings discussed in 1.2 in this thesis. From this starting point, Hayles establishes its function. It is "much more than attractive giftwrap. On the contrary, it is central to the constitution of a narrative in which the gene is cast as protagonist ... The entire argument depends on the narrative in which the selfish gene, far from being a mere rhetorical flourish, is the constitutive actor."[188] Hence, the structure in this case is closer to what Myers 'narrative of nature', a typical feature of popular science. As an illuminating contrast, I will again turn to Beer and her analysis of the evolutionary narrative in Darwin's the *Origin*:

> The narrative time of the *Origin* is not one that begins at the beginning, but rather in the moment of observation. The first words are: 'When we look' and the first two chapters are concerned with variation: under domestication and under nature. The ordering reinforces the argument. It suggests two crucial insights.
>
> Originating is an activity, not an authority. And deviation, not truth to type is the creative principle.[189]

How does the ordering of *The Selfish Gene* reinforce the argument? Whereas *The Origin* begins at the moment of observation: 'When we look,' the narrative of the gene begins at the beginning:

> I shall argue that the fundamental unit of selection, and therefore, of self-interest, is not the species, nor the group, nor even, strictly, the individual. It is the gene, the unit

[187] Hayles, Katherine, "Desiring Agency: Limiting Metaphors and Enabling Constraints in Dawkins and Deleuze/Gattari," *SubStance* 94/95, vol. 30 No. 1&2, 20012001, 147-148

[188] Ibid

[189] Beer *Darwin's Plots* 59

> if heredity. The argument takes time to develop, and we must begin with the beginning, with the very origin of life itself.[190]

The origin of life, as the narrator acknowledges, is to some extent imaginative:

> The account of the origin of life that I shall give is necessarily speculative; by definition, nobody was around to see what happened. There are a number of rival theories, but they all have certain features in common. The simplified account I shall now give is probably not too far from the truth.[191]

Sterelny, in his account for the selfish gene theory, describes the opening of the narrative like this:

> *The Selfish Gene* begins with a creation myth. Dawkins asks us to imagine a primitive, pre-biotic world – a world in which physical and biochemical processes make available a soup of chemical and physical resources. In this soup, nothing lives, nothing dies and nothing evolves. But then Something Happens. A *replicator*, by chance, comes into existence. A replicator is a molecule (or any other structure) that in the right environment acts as a template for its own copying.[192]

The chosen, hypothetical beginning is not depicted as fact, but as a structural device – an organizing principle. This aspect is emphasized in the end notes to the second edition:

> There are many theories of the origin of life. Rather than labour through them, in *The Selfish Gene* I chose just one to illustrate the main idea. But I wouldn't wish to give the impression that this was the only serious candidate, or even the best one. Indeed, in *The Blind Watchmaker*, I deliberately chose a different one for the same purpose ... In neither book did I commit myself to the particular hypothesis chosen ...[193]

The Beginning, then, is not established as a scientific fact as such, but as a convenient foundation on which to develop the argument and the genetic narrative. The focus on the beginning as a matter of choice, as arbitrary and inherently hypothetical, gives the impression that it is over-all irrelevant where and how the narrative begins, except insofar as it represents *a* beginning. The narrative of the gene contributes to the establishment of "a conceptual glue,"

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[190] *The Selfish Gene* 11

[191] Ibid 14

[192] Sterelny *Dawkins vs. Gould* 17

[193] *The Selfish Gene* 269

in the words of Segerstråle as presented in 1.2 above. But to which extent does the beginning influence the narrative throughout?

On the one hand, the construction of a Beginning makes possible the captivating narrative and what the narrator refers to as "purple passages"[194] which characterize the style of the book, and also adds to its readability:

> As the cistrons leave one body and enter the next, as they board sperm or egg for the journey into the next generation, they are likely to find that the little vessel contains their close neighbours of the previous voyage, old shipmates with whom they sailed on the long odyssey from the bodies of distant ancestors.[195]

The narrativity not only renders the text readable, and gives an impression of 'storytelling' making the scientific fact interesting to the lay-reader, it also conveys a normative perspective on evolutionary theory:

> The next important link in the argument, one that Darwin himself laid stress on (although he was talking about animals and plants, not molecules) is *competition* ...
> In our picture of the replicator acting as a template or mould, we supposed it to be bathed in a soup rich in the small building block molecules necessary to make copies. But when the replicators became numerous, building blocks must have been used up at such a rate that they became a scarce and precious resource. Different varieties or strains of replicator must have competed for them ... There was a struggle for existence among replicator varieties. They did not know they were struggling, or worry about it …. The process of improvement was cumulative. Ways of increasing stability and of decreasing rivals' stability became more elaborate and more efficient. Some of them may even have 'discovered' how to break up molecules of rival varieties chemically, and to use the building blocks so released for making their own copies. These proto-carnivores simultaneously obtained food and removed competing rivals. Other replicators perhaps discovered how to protect themselves, either chemically, or by building a physical wall of protein around themselves. This may have been how the first living cells appeared. Replicators began not merely to exist, but to construct for themselves containers, vehicles for their continued existence. The replicators that survived were the ones that built *survival machines* for themselves to live in. The first survival machines probably consisted of nothing more than a protective coat. But making a living got steadily harder as new arrivals arose with better and more

[194] See *The Selfish Gene* 38 and 270
[195] Ibid 33

> effective survival machines. Survival machines got bigger and more elaborate, and the process was cumulative and progressive.[196]

The notion of a cumulative and progressive process suggests a rationally satisfying linear movement towards the present, as well as continuous improvement and progress. The passage opens with a reference to Darwin, rooting the theory in the founder of evolutionary discursivity, and establishing the selfish gene theory as a mere extension of the original evolutionary theory, followed by a reminder of the hypothetical nature of the creation myth: 'In our picture of ...', 'we supposed ...'. The hypothetical nature of the narrative beginning is simultaneously maintained and given realism on the basis of logical necessity with the subsequent turn: 'Different varieties or strains of replicator *must have* competed for them'. Then, the scientific enquiry takes over with 'may have' and 'perhaps', before the paragraph is brought home with the affirmative indicative: 'Replicators began not merely to exist, but to construct for themselves containers, vehicles for their continued existence ... Survival machines got bigger and more elaborate, and the process was cumulative and progressive'. The structure of this paragraph to some extent mirrors the structure of the book, skipping back and forth between the hypothetical and the factual.

The beginning of the narrative furthermore makes possible the portrayal of the replicator as stable and eternal – notwithstanding a modification also to this point: "For simplicity I have given the impression that modern genes, made of DNA are much the same as the first replicators in the primeval soup. It does not matter for the argument, but this may not really be true."[197] It does however, matter for the force of the argument, as is evident from the subsequent portrayal of the replicator:

> As far as the gene is concerned, the gene pool is just the new sort of soup where it makes its living. All that has changed is that nowadays it makes its living by

[196] Ibid 18-19 (Dawkins' italics)
[197] *The Selfish Gene* 21

> cooperating with successive groups of companions drawn from the gene pool in building one mortal survival machine after the other. [198]

Thus the competitive rules of the ancient molecules in primeval soup can then be transposed to modern DNA, through the gene's eye point of view, and the image of the protagonist replicator is rendered vivid and clear, in accordance with Dawkins's definition of 'good poetic science'. The vividness of the image is further sustained by ironic statements like "What shall it profit a male if he shall gain the whole world, and lose his immortal genes?"[199] where the biblical reference indicates that the concept provides a *raison d'être* for all life. Whereas the structure of the *Origin*, according to Beer, expresses the insight that "originating is an activity, not an authority," and "deviation, not truth to type is the creative principle,"[200] the creative principle of *The Selfish Gene* seems to be the opposite; while genetic mutations cause evolution, the replicator itself is a stabilizing force of the narrative. In consequence, originating becomes the authority which provides the conditions for further development. By the time we reach the last chapter of the 1976 edition, entitled, "Memes: the New Replicators," the hypothetical outset of the creation myth has become more forcefully established. The meme, a term coined by Dawkins,[201] is depicted as the cultural equivalent to the gene: the replicator of cultural evolution. Memes are for example "tunes, ideas, catch-phrases, clothes-fashion, ways of making pots or of building arches."[202] Interestingly, the meme-theory was not, according to Dawkins, designed in order to explain cultural development, but rather to "claim almost limitless power for slightly inaccurate self-replicating entities, once they arise anywhere in the universe."[203] When the gene is depicted as

[198] Ibid 45
[199] Ibid 162
[200] Beer *Darwin's Plots* 59
[201] *The Selfish Gene* 192
[202] Ibid
[203] Ibid 322

analogous to memes, it has the effect of rooting the abstraction of the gene as a solid foundation upon which the abstraction of the meme rests.

> [The meme] is still in its infancy, still drifting clumsily around in its primeval soup, but already it is achieving evolutionary change at a rate that leaves the old gene panting far behind.
>
> The new soup is the soup of human culture. We need a name for the new replicator ...[204]

What happens here is a type of abstraction upon abstraction, which renders the first abstraction almost material by comparison. Also evident in the above quote is the notion of evolution as progress and improvement:

> As soon as the primeval soup provided conditions in which molecules could make copies of themselves, the replicators themselves took over. For more than three thousand million years, DNA has been the only replicator worth talking about in the world. But it does not necessarily hold these monopoly rights for a long time. Whenever conditions arise in which a new kind of replicator *can* make copies of itself, the new replicators *will* tend to take over, and start a new kind of evolution of their own. Once this new evolution begins, it will in no necessary sense be subservient to the old. The old gene selected evolution, by making brains, provided the soup in which the first memes arose.[205]

The new replicators 'take over' and, abstract and hypothetical though they may be, constitute the ideal replicator: one that not only 'is' information, but one that *is* information. But, in order for the analogy to stick, there must be competition and subsequent selfishness:

> Let us pursue the analogy between genes and memes further ... In both cases the idea of purpose is only a metaphor, but we have already seen what a fruitful metaphor it is in the case of the genes. We have even used words like 'selfish' and 'ruthless' of genes, knowing full well it is only a figure of speech. Can we, in the exact same spirit, look for selfish or ruthless memes?[206]

Competition does seem to take place, and the battlefields for rival memes are "radio and television time, billboard space, newspaper column-inches and library shelf-space"[207] where

[204] Ibid 192
[205] Ibid 193
[206] Ibid 196
[207] Ibid 197

they compete for space in the relatively small scope of the human brain. As in the origin of replicators, the emergence of selfishness is rationally rooted in the notion of competition that appeared as a result of scarcity of resource. Hayles paraphrases Evelyn Fox Keller on the notion of competition:

> Keller notes that competition has traditionally been linked with scarcity. Embedded within the coupling of scarcity and competition, she argues, lies a series of nested assumptions that inscript into biology the discourses of the liberal subject, in which competition for scarce resources is played off the Lockean (sic) premise that man, first and foremost, has the right to own himself. From this limited resource, a man through his labour creates other recourses in a competitive environment that rewards investment and punishes dissipation.[208]

In the creation myth of the origin of life, the gene is established as the subject of the narrative. The premise of competition is coupled with scarcity, rendering the genetic protagonist a liberal subject, providing the rationale of the selfish gene theory, which is given universal value by extension. The meme theory illustrates the power of analogy, and the effect of abstraction. Less elegant, and therefore less convincing, is the depiction of memes presented by David Haig in his essay "The Gene Meme"[209]: "I have crafted phrases to *grab your attention*, and have worked, and reworked, on clarifying concepts in my own mind ... The final version contains the ideas that have *grabbed my attention*. It has sometimes seemed like they were using me for their own ends."[210] Despite of the lack of rhetorical elegance, the technique is somewhat similar; the reader recognizes the idiom , and the recognition confirms the idea on an abstract level – the meme as agent, using the brain 'for its own ends' – the replicator replaces the body as agent in the evolutionary narrative. Hayles notes that

> *The Selfish Gene* is underwritten by two imperatives: preserving the autonomous agency characteristic of the liberal subject, and relocating it in the non-conscious modular units of the genes. These moves carry a double valence of anxiety and reassurance. Even though one's own agency is co-opted, agency itself is preserved.[211]

[208] Hayles "Desiring Agency" 149

[209] Haig, David, "The Gene Meme" Grafen and Ridley, Mark, 2006 50-65

[210] Ibid 64 (Haig's italics)

[211] Hayles "Desiring Agency" 150

In light of 2.1 above, we could treat the Lamarckian language as an aspect of 'reassurance' factor, rendering the evolutionary process graspable and in accordance with human understanding. In order to take a closer look at the aspect of 'anxiety of co-opted agency' that Hayles emphasises, I will in the following turn to the survival machine and its structuring in *The Selfish Gene*.

2.4 The Structural Function and Uncanny Effect of the Survival Machine

Chapter Thirteen of *The Selfish Gene,* added to the second edition, opens with the following paragraph:

> An uneasy tension disturbs the heart of the selfish gene theory. It is the tension between gene and individual body as fundamental agent of life. On the one hand we have the beguiling image of independent DNA replicators, skipping like chamois, free and untrammelled down the generations, temporarily brought together in throwaway survival machines, immortal coils shuffling off an endless succession of mortal ones as they forge towards their separate entities. On the other hand we look at the individual bodies themselves and each one is obviously a coherent, integrated, immensely complicated machine, with a conspicuous unity of purpose.[212]

The replicator as 'chamois' stand in striking contrast to the 'throwaway survival machines'. In addition to depicting the body as mechanic and restricted, while the gene represent wild and free Nature, the passage illustrates how the immortality of the gene is counterpoised to the temporary body. In this respect the survival machine confirms the notion of the eternal replicator – it is a necessary structural element:

[212] *The Selfish Gene* 234

> Individuals are not stable things, they are fleeting. Chromosomes too are shuffled into oblivion, like hands of cards soon after they are dealt. But the cards themselves survive the shuffling. The cards are the genes. The genes are not destroyed by crossing-over, they merely change partners and march on. Of course they march on. That is their business. They are the replicators and we their survival machines. When we have served our purpose we are cast aside. But genes are denizens of geological time: genes are forever.[213]

The transitory body represents the instability against which the notion of the continuity of the gene is reinforced. The immortality of the gene is an important aspect in constituting the gene as a stable force. By contrasting the continuity of the gene with the fleeting individual, its subordinate status is made manifest, and the rationale for gene agency is firmly established. The uncanny effect of this dichotomy of fleeting ≠ stable becomes pressing when linked to subjective experience:

> Another aspect of the particulateness of the gene is that is does not grow senile; it is no more likely to die when it is a million years old than when it is only a hundred. It leaps from body to body down the generations, manipulating body after body in its own way and for its own ends, abandoning a succession of mortal bodies before they sink into senility and death.[214]

Again, personal recognition is an essential precondition for understanding, and the selfish gene theory becomes a part of human understanding of the self. Not only does the body represent the fleeting contrast to the stable gene, it also represents the compound contrast to the particular, or singular, gene; with the modification that the gene, in fact *is* not a unit, but *represents* a unit:

> Colonies of genes they may be but, in their behaviour, bodies have undeniably acquired an individuality of their own. An animal moves as a coordinated whole, as a unit. Subjectively I feel like a unit, not a colony. This is to be expected. Selection has favoured genes that cooperate with others. In the fierce competition for scarce resources, in the relentless struggle to eat other survival machines, and to avoid being eaten, there must have been a premium on central coordination rather than anarchy within the communal body. Nowadays the intricate mutual co-evolution of genes has proceeded to such an extent that the communal nature of the individual machine is

[213] Ibid 35

[214] Ibid 34

> virtually unrecognizable. Indeed many biologists do not recognize it, and will disagree with me.[215]

The human consciousness experiences the body as a whole, and therefore does not acknowledge its communal nature. While the body as a complex in a biological or medical context is not necessarily an uncanny prospect, the personal observation that 'Subjectively I feel like a unit,' renders consciousness as marginal, misleading, not to be trusted. The notion of the survival machine is presented like this: "We are survival machines, but 'we' does not mean just people. It embraces all animals, plants, bacteria and viruses."[216] In the story of the gene, the body merely represents environment, and there is no reason to distinguish a human body from any other forms of environment which consists of molecules. In this context, consciousness has no place, and is actually so remote as to be reinserted as a heuristic device in depicting the mechanical processes of evolution. Thus, 'survival machine' may be said to be purged of its metaphorical meaning and used "in the particular way favoured by biologists."[217] At times, the particular meaning of the survival machine is explicitly referred to: "Remember that we are picturing the body as a robot survival machine with a pre-programmed computer controlling the muscles."[218] The image is explicitly created as a means to a specific end, and the pre-programmed computer is the brain:

> Brains may be regarded as analogous in function to computers. They are analogous in that both types of machine generate complex patterns of output, after analysis of complete patterns of input, and after reference of stored information ... The main way in which brains actually contribute to the success of the survival machine is by controlling and coordinating the contractions of muscles. To do this they need cables leading to the muscles, and these are called motor nerves.[219]

[215] Ibid 47
[216] Ibid 21
[217] Dawkins "In Defence of Selfish Genes" 572
[218] *The Selfish Gene* 69
[219] Ibid 49

The brain as controlling the nervous system, as in the example of a man throwing a ball and unconsciously performing mathematical calculations, correlates to the analogy of the brain as computer. By extension, the gene controls the brain, which is illustrated by analogy to chess-playing computers: "The genes too control the behaviour of their survival machines, not directly with their fingers on puppet strings, but indirectly like the computer programmer."[220] By further extension , the sum of the computer analogy and the disinterested survival machine is the robot:

> Four thousand million years on, what was to be the fate of the ancient replicators? They did not die out for they are past masters of the survival arts. But do not look for them floating loose in the sea; they gave up their cavalier freedom long ago. Now they swarm in huge colonies, safe inside gigantic lumbering robots, sealed off from the outside world, communicating with us by tortuous indirect routes, manipulating it by remote controls.[221]

With the image of the robot, the survival machine is no longer synonymous with a disinterested nervous system; it becomes representative of artificial intelligence. In the notes to the second edition of *The Selfish Gene*, the fusion of man and machine is two-way:

> We are in the golden age of electronics, and robots are no longer rigidly inflexible morons, but are capable of learning, intelligence, and creativity. Ironically, even as long ago as 1920 when Karel Capek coined the word, 'robots' were mechanical beings that ended up with human feelings like falling in love. People who think that robots are by definition more 'deterministic' than human beings are muddled.[222]

While it is noteworthy that it is a work of fiction that provides the rationale for the merging of man and computer, it is more relevant at this point to note that the mechanic control that the brain has upon the nervous system here becomes identical with consciousness. This also concerns the reader directly: "What on earth do you think you are, if not a robot, albeit a very complicated one?"[223]

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[220] Ibid 52
[221] Ibid 19
[222] Ibid 270
[223] Ibid

While the notion of human as intelligent machine has been fruitfully developed as a philosophical idea elsewhere,[224] the analogous relationship is here less philosophical than material. In spite of the modification: "There is no reason why the influence of genes cannot easily be reversed by other influences,"[225] the conceptualization of man as robot grounds the genetic as if calculation in consciousness, making the agenda of the gene the agenda of the survival machine, as for instance in this hypothetical example:

> If we were to program a computer to simulate a model survival machine making decisions about whether to behave altruistically, we should probably proceed roughly as follows. We should make a list of all the alternative things the animal might do. Then for each of these alternative behaviour patterns we program a weighted sum calculation. All the various benefits will have a plus sign; all the risks will have a minus sign; both benefits and risks will be *weighted* by being multiplied by the appropriate index of relatedness before being added up.[226]

The passage introduces the logic of cost-benefit calculation which is the essence of ESS-theory and subsequently the fundament of kin-selection upon which the selfish gene theory rests: the idea that altruism towards individuals will ideally be proportional to closeness in kin-relation, i.e. in the amount of shared genes. In turn, the programming process is translated to a simplified and hypothetical subjective soliloquy: "I am an animal who has found a clump of eight mushrooms. After taking account of their nutritional value ... I estimate that they are worth +6 units each ..."[227] But in the passage before all this, the as-if calculations are illustrated in terms of human consciousness:

> When a man throws a ball high up in the air and catches it again, he behaves as if he had solved a set of differential equations in predicting the trajectory of the ball ... At some subconscious level, something functionally equal to the mathematical calculations is going on. Similarly, when a man takes a difficult decision, after

[224] E. g. in Haraway Donna: "Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980s", originally published in *Socialist Review,* no. 80 (1985): 65–108 and in Hayles, Katherine N: *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics,* The University of Chicago Press, London and Chicago, 1999

[225] *The Selfish Gene* 267-268

[226] Ibid 96

[227] Ibid 97

> weighing up all the pros and cons, and all the consequences of the decision that he can imagine, he is doing the functional equivalent of a large 'weighted sum' calculation, such as a computer might perform.[228]

The juxtaposition of disinterested and (sub- or) unconscious muscular contractions with conscious reflection provides the intuitive rationale for unconscious cost-benefit calculation by connecting the recognizable 'weighing up of pros and cons' to computer programming. In the process, however, it renders man's consciousness inherently rational. A chess playing computer may act irrationally only by default – the concept of the disinterested survival machine does not only make possible writing outside of consciousness; when it provides an all-encompassing underlying principle of all life, it also excludes irrationality other than by default, disregarding the almost limitless capacity of irrationality that a conscious individual inhabits. The language of convenience, appealing to identification, the tale of the immortal gene juxtaposed to the mortal body, and the fundamental rationality which is played out, have a joint uncanny effect, reinforced by the fundamental genetic rationality manifesting itself in behaviour.

At the opening of this sub-chapter, we saw that, in the later editions of Dawkins's book, a chapter was added that addressed an 'uneasy tension disturbing the heart of the selfish gene theory: the tension between gene and individual body as fundamental agent of life'.[229] The problem is connected to the 'rogue sentences' that we saw in 1.3 in this thesis, wordings that the reader should mentally delete because they confuse individual selfishness with gene selfishness. The answer to the problem apparently lies in distinguishing the survival machine from the gene:

> In earlier chapters[230] I made the assumption that there was no problem, because individual reproduction was equivalent to gene survival. I assumed there that you can

[228] Ibid 96

[229] Ibid 234

[230] Written in 1976 whereas the additional chapters and notes were added in 1989

> say either 'The organism works to propagate its genes' or 'The genes work to force a succession of organisms to propagate them.' They seemed like two equivalent ways of saying the same thing, and which form of words you chose seemed a matter of taste.
>
> One way of sorting this whole matter is to use the terms 'replicator' and 'vehicle'. The fundamental units of natural selection, the basic things that survive or fail to survive, that form lineages of identical copies with occasional random mutations, are called replicators. DNA molecules are replicators. ... The vehicles that we know best are individual bodies like our own. A body, then, is not a replicator; it is a vehicle. I must emphasize this, since the point has been misunderstood. Vehicles don't propagate themselves; they work to propagate their replicators. Replicators don't behave, don't perceive the world, don't catch pray or run away from predators; they make vehicles that do all those things.[231]

This clarification deals with the misconception that the gene was attributed real intention, and that selfish behaviour was identical to gene selfishness. While the separation between gene and vehicle was obviously called for, the last sentence: 'they make vehicles do all those things' carries with it the displacement of agency, and the vague notion that free will is an illusion. In the preceding chapter of *The Selfish Gene*, the notion of ruthless selfishness is toned down with reference to research made by the political scientist R. Axelrod, who launched a competition between experts in game theory to submit rivalling strategies in order to find which strategies would be evolutionarily stable in the specific environment.[232] The strategies were categorized as 'nice', 'nasty', 'remorseful', 'unforgiving', 'forgiving',[233] and the Winning strategies turned out to be those who exhibited a certain degree of niceness and forgivingness. Hence, not only selfish behaviour benefits the selfish gene in terms of survival: "Without departing from the fundamental laws of the selfish gene, we can see how cooperation and mutual assistance can flourish even in a basically selfish world."[234]The moral problem posed by Mary Midgley as discussed in 1.3 above are seemingly solved. The question is; where does that leave *The Selfish Gene*? The final note of the original edition reads: "We are built as gene machines and cultured as meme machines, but we have the

[231] Ibid 253-4
[232] Ibid 208-220, for a survey of Game Theory and Prisoner's Dilemma ,see 202-208
[233] Ibid 208
[234] Ibid 224

power to turn against our creators. We, alone on earth, can rebel against the tyranny of selfish replicators."[235]

Selfish genes are still the inner daemons of man, the true nature of nature. Their agency is indirect but powerful: "Genes have something to gain from selfishly promoting the welfare of their own individual bodies."[236] Given that the gene is acknowledged to cooperate with kin, and in cases where it may promote the welfare of the survival machine, 'self interest' is perhaps a better word, and the two terms are occasionally used interchangeably in the book.[237] Hayles recognizes an ideological backdrop:

> Even though one's own agency is co-opted, agency itself is preserved. The key to the narrative is autonomy. To qualify as a "real" actor in the drama, an agent has to be able to preserve its own identity and defend itself against encroaching foreign elements. The winners are those actors who can subvert and co-opt another's agency while keep (sic) their own intact. In this sense Dawkins's gene is the ultimate individual, the triumphant product of that brand of Anglo-American ideology that ignores the complexities of social and economic contexts and declares success or failure to be solely the result of individual initiative.[238]

It is possible to discern the individualistic ideology in passages like this:

> Many copies of good genes are dragged under because they happen to share a body with bad genes, and many perish through other forms of ill luck, say when their body is struck by lightning. But by definition luck, good or bad, strikes at random, and a gene that is *consistently* on the losing side is not unlucky; it is a bad gene.
>
> One of the qualities of a good oarsman is teamwork, the ability to fit in and cooperate with the rest of the crew.[239]

Hayles' is a political reading, but it is not irrelevant. In the last of the additional chapters, while the selfishness of genes is modified, its rationale is elevated to the true meaning of life:

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[235] Ibid 201 (Chapter Thirteen is mainly as a summary of the *Extended Phenotype*, originally published in 1982, and as the final words are repeated in the note to this last passage, I regard it as the conclusive ending of *The Selfish Gene*)

[236] Ibid 256

[237] E.g. 11 and 33

[238] Hayles "Desiring Agency" 150

[239] *The Selfish Gene* 38-39 (Dawkins' italics)

> In some chapters of this book we have indeed thought of the individual organism as an agent, striving to maximize its success in passing on all its genes. We imagined individual animals making complicated economic 'as if' calculations about the genetic benefits of various courses of action. Yet in other chapters the *fundamental rationale* was presented from the point of view of genes. Without the gene's eye view of life there is no particular reason why an organism should 'care' about its reproductive success and of its relatives, rather than, for instance, its longevity.[240]

While there are some indications of what the fundamental rationale is not, it is not clear what it actually is, or to which degree it is based in anticipation or conclusion. If we turn to the preface to the 30th Anniversary edition, published in 2006 we are all the wiser:

> Let me repeat and expand the rationale for the word 'selfish' in the title. The critical question is which level in the hierarchy of life will turn out to be the inevitably 'selfish' level, at which natural selection acts? The Selfish Species? The Selfish Group? The Selfish Organism? The Selfish Ecosystem? Most of these could be argued, and most of them have been critically assumed by one or another author, but all of them are wrong. Given that the Darwinian message is going to be pithily encapsulated The Selfish *Something*, that something turns out to be the gene, for cogent reasons that the book argues.[241]

Selfishness is given – hence it is the precondition of the theory. The governing principle of selfishness suggests that this might be a case of bad poetic science, where the metaphor itself becomes the governing principle of the theory. If this foundation carries with it the fundamental rationale of all life, it is appropriate to enquire on which assumptions it rests, and which implications it carries with it. This issue will be the subject of the next chapter of my thesis. Included in my discussion will be the functions of the narrator as methodological control, the function of analogy in establishing the genetic rationale, and the notion of 'reading nature'.

[240] Ibid 234 (my italics)

[241] Ibid viii (Dawkins' italics)

Chapter 3: Reading Nature

What was the primitive tissue?
In that way Lydgate put the question – not
quite in the way required by the awaiting
answer; but such missing of the right word
befalls many seekers.[242]

Scientific theories and language do not cause social
or natural reality but rather become co-constructions
in social structure and interpretations of the natural
world that then create a loop of legitimation for
ideas or institutions that are created and reinforced.[243]

3.1 The Multiple Voices of *The Selfish Gene*

In the second edition of *The Selfish Gene*, Dawkins deals with the moral and ideological criticism that has been part of the book's reception history:

> I must add that the occasional political asides in this chapter make uncomfortable rereading for me in 1989. 'How many times must this [the need to restrain selfish greed to prevent the destruction of the whole group] have been said in recent years to the working people in Britain?' (p. 8) makes me sound like a Tory! In 1975, when this was written, a socialist government which I had helped to vote in was battling desperately against 23 per cent inflation, and was obviously concerned about high wage claims. My remark could have been taken from the speech of any Labour minister of the time. Now that Britain has a government to the new right, which has elevated meanness and selfishness to the status of ideology, my words seem to have acquired a kind of nastiness by association, which I regret. It is not that I take back what I said. Selfish short-sightedness has the undesirable consequences that I mentioned. But nowadays, if one were seeking examples of short sightedness in Britain, one would not look first at the working class. Actually, it is probably best not

[242] Eliot, George: *Middlemarch*, Oxford University Press, Oxford, 2008

[243] Rodgers, Diane: *Debugging the Link between Social Theory and Social Insects*, Louisiana State University press, Baton Rouge (2008) 22

> to burden a scientific work with political asides at all, since it is remarkable how quickly these date.[244]

With this note, the political statement of the original edition is resituated in its original context, demonstrating how social changes have destabilized the point of reference. Interestingly, Dawkins's musing on the appropriateness of 'political asides' in a scientific text is more concerned with their durability than with their ideological implications. As mentioned in 1.1 in this thesis, the author function is thus presented as the guarantee of the political implications of the book, and hence contributes to discouraging ideological and moral criticism such as that of Goatly, who sees the selfish gene theory as a scientific expression of Reaganism-Thatcherism,[245] Midgley, who reads gene selfishness as a moral doctrine[246] and Hayles, who recognizes an Anglo-American ideological backdrop in the agency of selfish genes.[247] The authorial presence thus both situates the author and his intentions in the text, and provides the conditions for a 'correct' reading. The personal preferences of the author are further established in the additional Chapter Twelve in the second edition of *The Selfish Gene*:

> A question that sociologists and psychologists sometimes ask is why blood donors (in countries, such as Britain, where they are not paid) give blood. I find it hard to believe that the answer lies in reciprocity or disguised selfishness in any simple sense. It is not as though regular blood donors receive preferential treatment when they come to need a transfusion. They are not even issued with little gold stars to wear. Maybe I'm naïve, but I find myself tempted to see it as a genuine case of pure, disinterested altruism.[248]

The strategy of depicting the author function as naïve has the function of designation, in Foucault's sense, rather than description; it redefines the depiction of a cynical and liberalist author-function which some critics, performing ideological readings, have identified. With this reference to the author-figure, criticism of the ideological implications of the book

[244] *The Selfish Gene* 268
[245] Goatly *Washing the Brain* 131 (2.1 in this thesis)
[246] Midgley "Gene-Juggling" 454 (2.2 in this thesis)
[247] Hayles "Desiring Agency" 150
[248] *The Selfish Gene* 230

becomes a personal matter. Personal statements like I believe ... or I feel ... cannot be refuted; they are intrinsically true. The personal tone does not only occur as an answer to criticism; it is invoked on some occasions in the original edition as well, in what could be seen as an anticipation of ideological criticism:

> My own feeling is that a human society based simply on the gene's law of universal ruthless selfishness would be a very nasty society in which to live. But unfortunately, however much we deplore something, it does not stop it being true. This book is mainly intended to be interesting, but if you would extract a moral from it, read it as a warning. Be warned that if you wish, as I do, to build a society in which individuals cooperate generously and unselfishly towards a common good, you can expect little help from biological nature.[249]

In this passage the narrator's (or author's?) 'own feeling' and conviction is contrasted to the objective and disinterested scientific truth of the selfish gene theory. Subsequently, it gives the vague indication that potential critics will be given to wishful thinking. Hence, the author's scientific integrity is increased; he is acknowledging an unpleasant scientific truth. Whereas the conventional passive voice emphasises an objective and disinterested representation, the active mode is here used to the same end.

Beer distinguishes the function of the active voice in the *Origin*: "The voiced presence of the observer in the language is a necessary methodological control, supplementing the work's imaginary history."[250] The reflexive narrator of *The Selfish Gene* too functions as a methodological control, on the one hand a supplement to the imaginative venture of personification as we have seen in the previous chapter of this thesis, and on the other as a guide to reading. The explicit endeavour to restrict reading and guide interpretation is particularly clear in the opening of the book. The first chapter is dedicated almost in its entirety to this control, and can be read as a manual for interpretation. Considering that the book addresses a broad readership, such a guide may be useful both for clearing up potential

[249] *The Selfish Gene* 3

[250] Beer *Darwin's Plots* 61

misunderstanding and for assisting the reader in the reading-process. However, it is prudent to investigate how the book correspond to these instructions, and whether they can be said to function productively or constraining. The first restriction is concerned with a potential moral reading: "I am not advocating a morality based on evolution. I am saying how things have evolved. I am not saying how we humans morally ought to behave."[251] We have already seen this imperative modification in several forms and on a number of occasions. While the message that human selfishness is not depicted as desirable is to some extent appropriate, the claim that the book is merely a narrative of natural process suggests that a reading focusing on the normative implications of the text is per se irrelevant. Following this instruction would entail ignoring the meaning potential of language, and to perform a purely scientific reading. However, the legitimacy of this requirement is questionable, considering that the language of the book does not aspire to accomplish a scientifically conform expression, but rather, as we have seen, relies on a creative language and abstraction.

Further restrictions on reading are the statements that the book is not "an advocacy of one position or another in the nature/nurture controversy" [252] and that it is not "a descriptive account of the detailed behaviour of man or any other particular animal species. I shall use factual details only as illustrative examples."[253] Implicit in the last assertion is an instruction to read factual details exclusively as affirmative for whichever claim they are meant to illustrate or support. The implied, or ideal, reader thus becomes a constitutive element of the text. This notion is reinforced by the reflexive narrator after a series of examples on selfish and seemingly altruistic behaviour among animals: "I am not trying to make a point by telling stories. Chosen examples are never serious evidence for any worthwhile generalization. These stories are simply intended as illustrations of what I mean by altruistic and selfish behaviour

[251] *The Selfish Gene* 2
[252] Ibid 3-4
[253] Ibid

at the level of individuals."[254] By renouncing the scientific value of 'stories' and 'chosen examples' the narrator is in the position to disclaim their status as scientific evidence, while still relying on the persuasive quality of example and, by extension, analogy. In effect, the plea is to *unread* the implications and presumptions on which analogy and examples rest, and simply absorb their meaning in a way that coheres with the inner logic and explicit intention of the text.

The reflexive narrator thus draws up the conditions for reading which the authorial presence confirms. On other occasions, the reflexive narrator functions more as a meta-narrator, commenting and to some extent reading the turns of the book, speaking from a place outside of the text:

> If building a baby is such an intricate cooperative venture, and if every gene needs several thousands of fellow genes to complete its task, how can we reconcile this with my picture of indivisible genes, springing like immortal chamois from body to body down the ages: the free, untrammelled, and self-seeking agents of life? Was all that nonsense? Not at all. I may have got a bit carried away with the purple passages, but I was not talking nonsense, and there is no real paradox. We can explain this by means of another analogy.[255]

The meta-narrator looks back on the text as if in retrospect, commenting on the 'purple passages' as if the argument were in real time and not a carefully structured narrative. The notion that the narrator has 'got a bit carried away' furthermore emphasizes the notion of the "fever of excitement"[256] in which the book was written, which calls for indulgence on the part of the reader, as discussed in 1.3 in this thesis. The meta-narrator appeals to the sympathetic reader, adding credibility to the text by engaging the reader in a relationship of trust:

> [I]f sexual, as opposed to non-sexual, reproduction benefits a gene for sexual reproduction, that is a sufficient explanation for the existence of sexual reproduction. Seen from the selfish gene's point of view, sex is not so bizarre after all.
>
> This comes perilously close to being a circular argument, since the existence of sexuality is a precondition for the whole chain of reasoning that leads to the gene

[254] Ibid 6
[255] Ibid 38
[256] Ibid xvii

> being regarded as the unit of selection. I believe there are ways of escaping from the circularity, but this book is not the place to pursue the question. Sex exists. That much is true.[257]

The ideal reader is assured that there is indeed no reason to be sceptical of the circularity of argument, and the guarantee of trustworthiness is in itself based in the self-reflexive admittance of the logical problem. By stating the obvious: 'Sex exists' after assuring the reader that there is no real problem, the 'must be' conclusion is brought into play, and will be affirmed as the argument develops. While on the one hand appealing to the sympathetic reader, the meta-narrator also indicates a notion of underlying credibility and control. For instance in the process of accounting for possible evolutionarily stable strategies in animal combat and rivalry: "Once again, by using words, we have talked ourselves into picturing an oscillation in a population. Once again, mathematical analysis shows that this is not correct."[258] Oscillation – the alternation of two potentially dominant strategies depending on which one is more beneficial at a given moment – suggests an error, since the whole idea is to predict one dominant strategy which may account for a specific kind of, in this case, aggressive behaviour. The reflexive interruption by the meta-narrator demonstrates awareness of the danger of lapsing into bad poetic science where language misleads the scientist into what is only seemingly a logical conclusion.[259]

An additional voice of the meta-narrator is present in the notes added to the second edition of *The Selfish Gene*. Here the eye is in fact retrospect and situated outside of the text, as the Dawkins of 1989 comments on the tone in the original version of 1976, specifically in the 9th chapter "Battle of the Sexes" dealing with exploitation between mates. The opening of the chapter reads: "If there is a conflict of interest between parents and children, who share 50

[257] Ibid 45
[258] Ibid 76
[259] Poetic science is introduced in 2.3 in this thesis

per cent of each other's genes, how much more severe must be the conflict between mates, who are not related to each other?"[260] The meta-narrator comments:

> This is one of the places in the book where my tone swung too far towards the cynical, selfish view of life. At the time it seemed necessary, since the dominant view of animal courtship had swung too far in the other direction. ... In this historical context the apparent cynicism of my opening sentence is understandable, but today I would adopt a softer tone.[261]

Paradoxically, the acknowledgment of the excessive cynicism of expression in the original publication is both a trust-inducing confession and a contextualizing justification of the cynical tone on the one hand, and evokes suspicion on the other: it becomes clear that the writer is administering facts and rhetoric in order to persuade. This notion is confirmed by the note to this statement: "I have a hunch that we may come to look back on the invention of the ESS concept as one of the most important advances in evolutionary theory since Darwin."[262] Since ESS is the central tenet of the book, this personal 'hunch' gives power to the argumentation; the 'discovery' of ESS has revealed the true workings of evolution. However, in the note, the claim is toned down: "This sentence is a bit over the top. I was probably overreacting to the then prevalent neglect of the ESS idea in the contemporary biological literature, especially in America … The term is neglected no longer, and I can now take a more judicious and less evangelical view."[263] In this modification, the importance of gaining power of definition becomes clear. While one might argue that exaggeration and verbal slanting is more common in popular writing than in professional science writing, the genre of 'public science' – rooted in the notion of the imaginary expert reader – warrants scientific credibility. The notion of an 'evangelical view' disturbs this credibility.

[260] *The Selfish Gene* 140
[261] Ibid 300
[262] Ibid 84
[263] Ibid 287

Whereas the meta-narrator in a sense operates outside of the text, the reflexive narrator in the text opens for a dialectical, Socratic structure, including the reader in the argument:

> On the face of it, this [animal acceptance of flock hierarchy] seems an awkward example for the selfish gene theory to explain. Why don't the outcasts try, try, and try again to oust a territory holder, until they drop from exhaustion? But wait, perhaps they do have something to lose.[264]

Again, I will turn to Beer's reading of the *Origin* in order to illuminate the structural choice:

> The language of the *Origin* emphasises the element of address. Conversation rather than abstraction is the predominant mode, and the emphasis is upon things individually seen, heard, smelt, touched, tasted. The voiced presence of the observer in the language is a necessary methodological control, supplementing the work's imaginative history.[265]

Similarly, the reflexive narrator of *The Selfish Gene* conversationally addresses the reader, with the addition that what is seen, heard, smelt, touched, tasted and *felt* is emphasised. The comparison is, of course, not exhaustive: as demonstrated in the previous chapter of this thesis, Dawkins's text is indeed based in abstraction. The conversational mode serves to supplement the abstract meaning: "Analogies with computers and with human decision taking are all very well. But now we must come down to earth and remember that evolution in fact occurs step-by-step, through the differential survival of the genes in the gene-pool."[266] The narrator takes the argument 'down to earth,' and is as such a controlling element, in a sense checking the overly enthusiastic writer. The dialectical, conversational structure also gives an impression of openness, as in this example, when the narrator points to the chosen definition of the gene: "What I have now done is to *define* the gene in such a way that I cannot really help being right!"[267] The exclamation mark indicates something resembling surprise, and the seeming circularity of argument is modified in the next paragraph: "What I have done is to

[264] Ibid 118
[265] Beer *Darwin's Plots* 61
[266] *The Selfish Gene* 60
[267] Ibid 33 (Dawkins's italics)

define a gene as a unit which, to a high degree *approaches* the ideal of indivisible particulateness."[268] While on the one hand anticipating criticism, this rhetorical turn functions to include the reader in the development of the argument and indicates that the text does not underestimate the reader.

The textual strategy of addressing the reader opens for an including 'we' functioning on multiple levels. The reader is introduced to a universal 'we' at an early stage: "The argument of this book is that we, and all other animals, are machines created by our genes."[269] The 'we' situates both the narrator and the reader in the evolutionary narrative, and thus establishes the narrator and the reader on common ground, in turn opening for a personal approach: "One of your genetic units may also be present in your second cousin. It may be present in me, and in the Prime Minister and in your dog, for we all share ancestors if we go back far enough."[270] On a humorous note, the narrator may take a somewhat frivolous approach and the including 'we' places the reader in an intimate relation with the narrator. This intimacy in turn gives the narrator licence to operate in a personal sphere, as in this example where kin-selection is introduced: "It is rather tedious going through the calculations from first principles every time, so here is a rough and ready rule for working out the relatedness between any two individuals *A* and *B*. You may find it useful in working out your will, or in interpreting apparent resemblances in your own family."[271] The participation of the reader in the construction of the argument, and the establishing of the including 'we' provides the possibility of making an ideal reading of the text a matter of course, as in this passage towards the end of the original edition:

Mutual grooming is in fact very common in both birds and animals.

[268] Ibid (Dawkins's italics)
[269] Ibid 2
[270] Ibid 30-31
[271] Ibid 91

> This makes immediate intuitive sense. Anybody with conscious foresight can see that it is sensible to enter into mutual back-scratching arrangements. But we have learned to beware of what seems intuitively sensible.[272]

'We have learned' gives the impression that reading has been a communal endeavour, that the ideal reader has gone through the same journey of discovery and acknowledgement as the narrator, or even the author in the origination of the selfish gene theory. Thus, the imaginary, abstract and intuitive understanding of the gene's rationale and of ESS has become a matter of rational inference, while intuitive understandings clashing with the core of the selfish gene theory are seen as a threat to the disinterested scientific rationality. By absorbing the reader in the argumentative development, the narrator has ascertained the power of definition, and the selfish gene theory is presented as the only realistic perspective on biological development.

3.2 The Ideal Reader and the Power of Definition

The including 'we' furthermore opens for an oppositional 'them' or marginal 'other', which in turn may make the alliance between the reader and the narrator stronger, and may also forestall criticism. I have discussed the latter strategy elsewhere this thesis, for instance in 1.3 where I commented on how critics were suspected of reading the book 'by title only' or of simply not understanding its scientific message. The narrator's recommendation of the book *Social Evolution* by Robert L. Trivers has a similar effect: "I recommend it, not only for its contents but for its style: clear-thinking, academically correct but with just enough

[272] Ibid 183

anthropomorphic irresponsibility to tease the pompous ..."[273] The rhetorical twist is almost banal, yet efficient: if the reader is sceptical toward the anthropomorphisms of *The Selfish Gene*, she represents the other, the unwilling and petty contrast to the ideal reader. Hence, criticism of the anthropocentric language is discouraged, and the implicit instruction is again to unread anthropomorphism.

Another effective opposition is religion, which is referred to in apparently incidental remarks, in ironical biblical references may which take the form of analogy, for instance in an example of genetic copying-errors resulting in mutation, illustrated by an analogy to the hand-written copying of the Bible, leading to the erroneous biblical representation of the 'virgin mother'.[274] The juxtaposition of religious references in the book not only serves to discredit religion, a project that Dawkins is famously known for pursuing,[275] it may also give the selfish gene theory added realism and rationality by comparison. By polarization, the ideal reader is firmly guided into taking the 'clear-thinking' position, and to confirm the ideas of the book on rational grounds, as for instance in this note to the second edition:

> People who think that robots are by definition more 'deterministic' than human beings are muddled (unless they are religious, in which case they might consistently hold that humans have some divine gift of free will denied to mere mechanics). If, like most of the critics of my 'lumbering robot' passage, you are not religious, then face up to the following question. What on earth do you think you are if not a robot?[276]

The rhetorical trap and the personal challenge are obvious; only 'muddled' people or the fundamentally irrational religious would question the appropriateness of human as artificial intelligence. In consequence, the normative aspect of the metaphor, as for instance the conception of irrationality by default as discussed in 3.4 in this thesis, goes unmentioned.

Anthropologists and social scientists fulfil a similar function of irrational otherness:

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[273] Ibid 289

[274] Ibid 16, elaborated in an end note on page 270

[275] See e.g *The God Delusion*, First Marnier Books, New York, 2008 (2006)

[276] *The Selfish Gene* 270

> Many social anthropologists are preoccupied with 'kinship' in the societies which they study. … Human customs and tribal rituals commonly give great emphasis to kinship; ancestor worship is wide-spread, family obligations and loyalties dominate much of life. Blood-feuds and inter-clan warfare are easily interpretable in terms of Hamilton's genetic theory. Incest taboos testify to the great kinship-consciousness of man, although the genetical advantage of an incest taboo is nothing to do with altruism; it is presumably concerned with the injurious effects of recessive genes which appear with inbreeding. (For some reason many anthropologists do not like this explanation.)[277]

The social phenomenon of legislation against incest 'testifies' to biological facts, and the theory is in effect merging 'nature and nurture'. The slight puzzlement of the narrator towards the scepticism of anthropologist is elaborated in an end note:

> Anthropologists who object to Darwinian explanations of incest-avoidance perhaps do not realize what a strong Darwinian case they are opposing. Their arguments are sometimes so weak as to suggest desperate special pleading. They commonly say, for instance: 'If Darwinian selection had really built into us an instinctive revulsion against incest, we wouldn't need to forbid it. The taboo only grows up because people have incestuous lusts. So the rule against incest cannot have a "biological" function, it must be purely "social".' This objection is rather like the following: 'Cars don't need locks on the ignition switch because they have locks on the doors. Therefore ignition locks cannot be anti-theft devices; they must have some purely ritual significance!'[278]

While the conflict appears to me to revolve around the question of whether incestuous lust should not, according to the selfish gene theory, have been disfavoured by natural selection because it reduces the chances of gene survival, the rather ridiculous parallel of car-locks serves to discredit the criticism posed by anthropologists. Again, the rationality of the theory is enforced by contrast to an irrational other, and the ideal reader places herself in the camp of the clear-thinking.

The status of the selfish gene theory as clear thinking is also contrasted to other biological theories, most markedly that of group selection. Group selection – the idea that natural selection occurs on group-level for the good of the species, was more dominant when

[277] Ibid 99

[278] Ibid 294

The Selfish Gene was first published than it is today, and in many respects the book can be said to be an advocacy against this perception:

> Although the group-selection theory now commands little support within the ranks of those professional biologists who understand evolution, it does have great intuitive appeal...
>
> Perhaps one reason for the great appeal of the group-selection theory is that it is thoroughly in tune with the moral and political ideas that most of us share.[279]

The fact that the selfish gene theory does not concur with a moral intuition here becomes a supporting element for its status as disinterested and rational in contrast to the wishful thinking of group-selectionists. The gene-centred view of natural selection is also indirectly contrasted to 'Neo-Lamarckian' theory[280], which may also include epigenetics, meaning, as the word suggests, influence outside of or other than, the gene[281]: "Genes do indirectly control the manufacture of bodies, and the influence is strictly one way: acquired characteristics are not inherited"[282]. This quote is taken from the original edition of *The Selfish Gene*, which was written in a period when

> the 'inheritance of acquired characteristics' was seen as the ultimate *Darwinian* heresy. Those who have sought to support or research this area in any way have often been depicted as acting on the maverick fringes of the scientific community. This is the atmosphere in which Dawkins began his scientific career, and subsequently wrote *The Selfish Gene*.[283]

Elsdon-Baker adds that "if any environmentally driven inheritance of acquired characteristics were to occur in nature – as now seems increasingly likely, given new findings in some areas of research – it would completely undermine Dawkins' 'selfish gene' hypothesis."[284] In the

[279] Ibid 8-9

[280] not to be confused with the Lamarckian mode of representation discussed in 3.1 in this thesis

[281] Elsdon-Baker, *The Selfish Genius* 119

[282] *The Selfish Gene* 23

[283] Elsdon-Baker, *The Selfish Genius* 113 (Elsdon-Baker's italics)

[284] Ibid 114 for an accessible overview of Lamarckianism versus Darwinism, see Chapter 4 "Who's Darwinism is it Anyway?" 103-124

notes to the second edition the notion of inheritance of acquired characteristics is mentioned only briefly:

> Superficially, successive generations of stick-insect bodies appear to constitute a lineage of replicas. But if you experimentally change one member of the lineage (for instance by removing a leg), the change is not passed on down the lineage. This ... is the fundamental reason for saying that the individual organism is not the 'unit of selection' – not a true replicator. It is one of the most important reasons for the universally admitted fact that the 'Lamarckian' theory of inheritance is false.[285]

The claim that the Lamarckian theory is 'universally admitted' to be false, was added in 1989, and the preface to the 30th Anniversary Edition of 2006 does not mention the issue. While the contrasting oppositions of religion and social sciences could be said to be directed towards the ideal reader and making her a conspiring agent, the marginalization of Lamarckian theory, and therefore also of the notion of inheritance of acquired characteristics, has a more general effect. In the words of Elsdon-Baker:

> [D]oes it really mean anything any more to call someone a Darwinian, an anti-Darwinian or a Lamarckian? Surely, the only purpose these labels can serve is to define an antithesis to one's own perspective. Over the past 60 years they have really acted, in the public sphere at least, as a rather crude shorthand for who is 'in' and who is 'out' in the scientific community ... And to be labelled anti-Darwinian has now, more than ever taken on a whole new meaning – it now carries with it the stigma of pseudo-science or, at worst, of fuelling anti-scientific sentiment.[286]

Notably, Elsdon-Baker emphasizes the power of labels in the 'public sphere'. This is an important aspect of the genre of 'public science': the power of definition and of establishing a public common sense. In the ocean of information that modern man is exposed to, rough categories may be all the more powerful because they help to navigate and discriminate between orthodox science and 'pseudo-science'. In this respect, the selfish gene theory, defined as Neo-Darwinism, and in turn as The Orthodox Evolutionary Theory, has great power to colour public opinion. I touched upon this issue in 1.1 in this thesis, and quoted

[285] *The Selfish Gene* 274

[286] Elsdon-Baker, *The Selfish Genius* 250

Elsdon-Baker on the claim that "Neo-Darwinists conflate their own ideas with Darwinism."[287] The entry on Neo-Darwinism in the glossary in an appendix to Dawkins' second book, *The Extended Phenotype*, first published in 1982[288] illustrates this conflation:

> neo-Darwinism: A term coined (actually re-coined, for the word was used in the 1880s for a very different group of evolutionists) in the middle part of this century. Its purpose was to emphasize (and in my opinion exaggerate) the distinctness of the modern synthesis of Darwinism and Mendelian genetics, achieved in the 1920s and 1930s, from Darwin's own view of evolution. I think the need for the 'neo' is fading, and Darwin's own approach to 'the economy of nature' now looks very modern.[289]

With this entry, the message is conveyed that the Neo-Darwinist approach which the selfish gene theory represents is not one of several theories, but the one and only realistic alternative, rendering other suggestions marginal and other. With this observation, I draw this more general discussion to a close, and enter into a more specific discussion of 'the economy of nature' and the role of analogy in *The Selfish Gene.*

3.3 The Analogical Argument

Evelyn Fox Keller in her book *Making Sense of Life*[290] observes the power of D'Arcy Thompson's[291] visual analogies:"Indeed, so effective are some of his examples that the readers may find themselves inexorably drawn to a more certain conviction – not merely of

[287] Elsdon-Baker, *The Selfish Genius* 103

[288] Dawkins, Richard, *The Extended Phenotype*, 3rd ed Oxford University Press, Oxford and New York, 2008 (1982)

[289] Ibid, Glossary, 298

[290] Keller, Evelyn Fox, *Making Sense of Life: Explaining Biological Development with Models, Metaphor and Machines*, First Harvard University Press, Harvard, 2003 (2002) Keller is Professor Emerita of the History and Philosophy of Science at Massachusetts Institute of Technology

[291] Zoologist and comparative anatomist 1860-1948, author of the biological classic of 1917: *On Growth and Form*, Press Syndicate of the University of Cambridge, Cambridge 2000

possibility but of actuality."[292] This section will be concerned with the power of not visual, but social analogy. The analogical argument of *The Selfish Gene* is particularly intriguing due to the explicit claim by the narrator that "I am not trying to make a point by telling stories. Chosen examples are never serious evidence for any worthwhile generalization."[293] I argued in 3.1 that this claim in effect encourages the reader to unread analogies, other than in terms of their potential of illumination and in turn confirmation of the selfish gene theory. A requirement of good poetic science, as we have seen in 1.3, is that it "should note helpful analogies and metaphors that stimulate the imagination, conjure in the mind images and allusions that go beyond the needs of straightforward understanding."[294] Unreading analogy takes part in the 'conjuring in the mind of images and allusions', contributing to the achievement of a seamless effect of imaginative stimulation. Thus, allusion by analogy may open for the mental transition from 'possibility to actuality', as Keller puts it. In effect, then, analogy may establish a universal foundation upon which generalization may be ensured without appealing to 'chosen example as evidence for generalization', like in this example:

> Animals have to be given by their genes a simple rule for action, a rule that does not involve all-wise cognition of the ultimate purpose of the action, but a rule that works nevertheless, at least in average conditions. We humans are familiar with rules, and so powerful are they that if we are small minded we obey a rule itself, even when we can see perfectly well that it is not doing us, or anybody else, any good. For instance, some orthodox Jews and Muslims would starve rather than break their rules against eating pork. What simple practical rules could animals obey which, under normal conditions, would have the indirect effect of benefiting their close relations?[295]

In this passage, the urge to obey rules is depicted as universal – a notion that in turn confirms the image of genetic information in the form of instructions. The effect of recognition gains force by rapid transition; 'Animals have to be given instructions...' is directly preceded by

[292] Keller, *Making Sense of Life* 57
[293] *The Selfish Gene* 6
[294] Dawkins, *Unweaving the Rainbow* 180
[295] *The Selfish Gene* 99

human reference and recognition: 'We humans are familiar with rules...' before turning back to unconscious animals on the grounds of the universality of rules, notably in the subjunctive: 'What simple practical rules could animals obey...?' Thus, the rationale for gene instruction is forcefully established, but not claimed as empirical truth.

The language of convenience in itself opens for conjuration by virtue of recognition, as discussed in 3.1 in this thesis. The anthropomorphic language gains a particularly prominent social relevance in Chapter 8 "The Battle of The Sexes."[296] In the discussion of the ESS of mates, Dawkins suggests a model based on the anthropomorphic categories 'coy' or 'fast' females and 'faithful' or 'philanderer' males:

> The behavioural rules of the four types are as follows. Coy females will not copulate with a male until he has gone through a long and expansive courtship lasting several weeks. Fast females will copulate immediately with anybody. Faithful males are prepared to go on courting for a long time, and after copulation they stay with the female and help her to rear the young. Philanderer males lose patience quickly if a female will not copulate with them straight away: they go off and look for another female; after copulation too they do not stay and act as good fathers, but go off in search for fresh females. ... [T]hese are not the only possible strategies, but it is illuminating to study their fates nevertheless.[297]

At the end of the chapter, the reflexive narrator comments on the human reference:

> I have not explicitly talked about man, but inevitably, when we think about evolutionary arguments such as those in this chapter, we cannot help reflecting about our own species and our experience. Notions of females withholding copulation until a male shows some evidence of long-term fidelity may strike a familiar chord. This might suggest that human females play the domestic-bliss strategy rather than the he-man strategy. Many human societies are indeed monogamous. In our own society, parental investment is large and not obviously unbalanced. Mothers certainly do more direct work for children than fathers do, but fathers often work hard in a more indirect sense to provide the material resources that are poured into children. On the other hand, some human societies are promiscuous. What this astonishing variety suggests is that man's way of life is largely determined by culture rather than by genes. However, it is still possible that human males in general have a tendency towards promiscuity, and females a tendency towards monogamy, as we would predict on evolutionary

[296] Ibid 140-165

[297] Ibid 151

> grounds. Which of these two tendencies wins in a particular society depends on details of cultural circumstance, just as in different animal species it depends on ecological details.[298]

In this passage lies both modification and assertion; on the one hand, human society is written out of genetic determination by the emphasis on cultural influence. On the other, human society is divided into the categories of either 'promiscuous' or 'monogamous', and the model of human society on which the ESS of animals was established is reinserted in the human sphere, resulting in a 'loop of legitimation'.

This term was coined by the social theorist Diane Rodgers in her book *Debugging the Link Between Social Theory and Social Insects*[299] published in 2008:

> Scientific theories and language do not cause social or natural reality but rather become co-constructions in social structure and interpretations of the natural world that then create a loop of legitimation for ideas or institutions that are created and reinforced.

The Selfish Gene, then, does not cause or construct social gender, but, by analogy with nature, the normative notion of monogamy and of females demanding a long engagement and 'withholding copulation' becomes naturalized. When the notion is reapplied to human society, it is with added force. Although legislation and social control may indicate a social norm, a real life society is never either universally promiscuous or monogamous. Considering the anthropomorphic nature of the gender-based ESS model, the statement that "I have not explicitly talked about man, but inevitably, when we think about evolutionarily arguments such as those in this chapter, we cannot help reflecting about our own species and our experience"[300] seems somewhat disingenuous. The focus is that of the inevitable human tendency of anthropocentrism, rendering the anthropomorphic model a matter of course rather than a matter of representational choice. While the analogy of human behaviour plays on

[298] Ibid 164

[299] Rodgers, Diane: *Debugging the Link between Social Theory and Social Insects*, Louisiana State University press, Baton Rouge (2008)

[300] *The Selfish Gene* 164

social norms and gendered bias this aspect is presented as marginal: analogy is to be read only as 'illustrative examples'. Thus, criticism of the social aspects, along with their normative implications, of analogy is rendered unmentionable, and representative for the marginal 'other' in opposition to the ideal reader. Hence, the loop of legitimation can only be detected in what would be defined as a misreading.

The predominant analogy of *The Selfish Gene* is that of economics – the governing principle of the cost-benefit calculation of ESS. Early in the book, gambling is introduced as a metaphor:

> We can carry the metaphor of gambling a little further. A gambler must think of three main quantities, stake, odds and prize. If the prize is very large, a gambler is prepared to risk a big stake. A gambler who risks his all on a single throw stands to gain a great deal. He also stands to lose a great deal, but on average high-stake gamblers are no better and no worse off than other players who play for low winnings with low stakes. An analogous comparison is that between speculative and safe investors on the stock market.[301]

At this point, the concept of ESS has not yet been elucidated, and we may read the analogy as a heuristic device, preparing the reader for what is to come. The economic foundation is subsequently more firmly established:

> An ESS is stable, not because it is particularly good for the individuals participating in it, but simply because it is immune to treachery from within. ...
>
> Even in human pacts there is a constant danger that individuals will gain so much in the *short term* by breaking the pact that the temptation to do so will be overwhelming. Perhaps the best example of this is price fixing. It is in the long term interests of all individual garage owners to standardize the prize the price of petrol at some artificially high value. Price rings, based on conscious estimation of long term best interests, can survive for long periods. Every so often, however, an individual gives in to the temptation to make a quick killing by cutting his prices. Immediately, his neighbours follow suit, and a wave of price cutting spreads over the country ... So, even in man, a species with the gift of conscious foresight, pacts or conspiracies based on long-term best interests teeter constantly on the brink of collapse due to treachery from within. In wild animals, controlled by the struggling genes, it is even more

[301] Ibid 56

> difficult to see ways in which group benefit or conspiracy strategies could possibly evolve. We must expect to find evolutionary stable strategies everywhere.[302]

As demonstrated before, recognition is enforced by transition; the notion of treachery from within is applied to natural phenomena, reinserted in the human sphere, and then inserted back to wild animals. In a loop of legitimation, the phenomenon of price rings, which is an expression of a specific socio-political system of organization, is elevated to an expression of a universal principle. The personal political preferences of the author are in this respect highly irrelevant, indeed, the implications of the analogy may well be unintentional and even un-reflected. The loop of legitimation moreover comes to govern the rationale of the text as the argumentation develops. For instance, the battle of the sexes is presented with reference to Trivers, among others, and Dawkins elaborates their ideas by extension and discussion. Trivers suggested that if a male goes through a long 'engagement period', he will have invested so much time and energy on her that he will be 'committed' to her, and thus less likely to desert her.[303] At this point Dawkins corrects Trivers:

> He thought that prior investment in itself committed an individual to future investment. This is fallacious economics. A business man should never say 'I have already invested so much in the Concorde airliner (for instance) that I cannot affords to scrap it now'.
> He should always ask instead whether it would pay him *in the future*, to cut his losses, and abandon the project now, even though he has already invested heavily in it.[304]

The loop of legitimation has taken analogy from 'possibility to actuality' where the rationale of economics has become synonymous with the rationale of nature to the extent that the conventions of economic consideration are no longer only a heuristic analogy. Rather, the logic of social phenomena is a governing principle to the extent that the establishment of a credible rationale for animal behaviour depends on the economical logic of the analogy.

[302] Ibid 72–73 (Dawkins's italics)
[303] Ibid 150
[304] Ibid (Dawkins's italics)

Again, this need not be an expression of the author's personal stance; rather, it may be read as the reverse. Personal moral preferences are depicted as an irrational and sentimental counterpoint to the clear-thinking selfish gene theory, as demonstrated in the discussion of group selection. Within this paradigm, an economically based logic becomes defined as the morally unfortunate, but inevitably realistic rationale of nature. Hence, the notion of gene selfishness, or self interest, comes to represent a detached and disinterested view of life not in spite of, but because of its moral undesirability, and the capitalistic model of social organization becomes, in a loop of legitimation, the governing principle of the fundamental rationale on which the gene's eye view rests.[305]

3.4 Reading Nature

W. D. Hamilton,[306] in his review of *The Selfish Gene,*[307] sees the book as representing the 'new face of evolution' and asks rhetorically: "What then, is this new face of evolution? To a certain extent it is like a new interpretation of Shakespeare: it was all in the script but somehow it passed unseen."[308] In this notion lies an assumption of nature as readable, of an inner coherent structure that only needs discovery and revelation. The narrative of nature, then, is no longer depicted as a mode of writing rendering a text accessible to a general readership, as in Myer's definition, but rather presumes the inner workings of a coherent nature. If the selfish gene theory does represent a reading of nature, we could distinguish

[305] See 1.4 of thesis

[306] W. D. Hamilton is one of the dominant figures on whose work *The Selfish Gene* is based. He has done considerable research on relatedness and kin-selection.

[307] Hamilton, W. D: "The Play by Nature", *Science Journal* 13 May 1977, Vol. 196 no. 4291

[308] Ibid 758

natural selection as the author function, and retrace the steps of this thesis to 2.1 "What is an Author?"

> [T]he author-function … is, rather, the result of a complex operation which constructs a certain rational being that we call 'author'. Critics doubtless try to give this intelligible being a realistic status, by discerning a 'deep' motive, a 'creative power', or a 'design,' the milieu in which writing originates. Nevertheless, these aspects of an individual which we designate as making him an author are only a projection, in more or less psychologizing terms, of the operations that we force texts to undergo, the connections that we make, the traits that we establish as pertinent, the continuities that we recognize, or the exclusions that we practice.[309]

Particularly pertinent to this discussion is the 'deep motive' that is discerned, not in the 'milieu in which writing originates' but in the milieu in which evolution and Life originates. Hamilton's notion that the selfish gene theory merely discovers 'what was already in the script' thus disregards the process of selectivity that is an inevitable component in any act of reading. Instead, the act of reading is portrayed as a window for universal truth, the revelation of a general pattern:

> What conjurers do with mirrors is nothing to what nature, if Dawkins is right, does with no more promising a starting material than congealed primeval soup. It will serve to characterize the new look that biology has in this and some other recent books (such as E. O. Wilson's *Sociobiology*) to say that it shines with a hope that these farthest extensions of life may soon fit more comprehensibly, in essence if not in some details (religious persons and Neo-Marxists may reverse that phrase if it suits them better), into a general pattern that includes the simplest cell wall, the simplest multicell body, and the blackbird's song.[310]

The presupposition of a general pattern that may let itself be revealed becomes a governing principle of *The Selfish Gene* in the sense that the reading of nature that the book performs must give an exhaustive description of Life, this notion is supported by the preface to the second edition:

[309] Foucault, "What is an Author" 203

[310] Hamilton, "The Play by Nature" 758

> The gene's eye view of Darwinism is implicit in the writings of R. A. Fisher and the other great pioneers of Neo-Darwinism in the early thirties, but was made explicit by W. D. Hamilton and G. C. Williams in the sixties. For me their insights had a visionary quality. But I found their expressions of it too laconic, not full throated enough. I was convinced that an amplified and developed version could make everything fall into place, in the heart as well as in the brain. I would write a book extolling the gene's eye view of evolution.[311]

The urge to make 'everything fall into place, in the heart as well as in the brain' makes it necessary to establish one 'fundamental rationale' – a 'deep motive' around which natural selection takes place. As shown in 3.3 above, the rationale of modern Western social organization is projected to the workings of natural selection. A fundamental question is then, in the words of Foucault: which operations take place in the representation of the gene's eye view?

I have previously argued that the underlying rationality of the selfish genes is demonstrated by the portrayal of the survival machine as robot and the brain as computer, rendering irrationality possible only by default. Hence, the degree of a specific rationality that may be distinguished in behaviour becomes the prime measure for establishing the likelihood and credibility of a particular strategy, or rather in establishing a rationale behind the observed behaviour. This practice of interpretation and reading as scientific discovery opens for an extension of the behavioural analysis to make predictions, or even to conclude, on grounds of logical extension. Thus, the as-if calculations of *representation* are opened for extension to must-be conclusions of *reading*:

> Other species, such as kittiwakes form monogamous pair-bonds of exemplary fidelity, and both partners cooperate in the work of bringing up children. Here we must suppose that some evolutionary counter-pressure has been at work: there must be a penalty attached to the selfish mate-exploitation strategy as well as benefit, and in kittiwakes the penalty outweighs the benefit.[312]

[311] *The Selfish Gene* xvi
[312] Ibid 147

Whereas the narrator on the one hand warns against interpretation of natural events based on what seems 'intuitively sensible",[313] the must-be conclusion indicates that intuition is indeed applicable to scientific theory, but only after it has been re-inscribed in terms of the established rationality.

However, one exception is allowed for: The model of 'coy', 'fast', 'faithful' and 'philanderer' turned out, upon testing, not to result in an evolutionary stable strategy as predicted, and the narrator remarks in an end note:

> By analogy with hawks and doves [the model of aggressive behaviour] I assumed, quite wrongly, that the cycle was hypothetical only, and that the system would really settle into a stable equilibrium. Schuster and Sigmund's parting-shot leaves no more to be said:
>
> Briefly, then, we can draw two conclusions:
> (a) that the battle of the sexes has much in common with predation; and
> (b) that the behaviour of lovers is oscillating as the moon, and unpredictable as the weather.
> Of course, people didn't need differential equations to notice this before.[314]

Quoting the good-humoured conclusion of the mathematical biologists, Dawkins allows for irrationality to take place in nature, but, notably, only in relation to Love, playing on the culturally grounded recognition of the Romantic conception of love as mystical, inexplicable and inherently elusive. Thus, the battle of the sexes is momentarily re-configured from an example of the economy of exploitation to an esoteric exception.

Other than this exception, natural phenomena are read in accordance with the rationale, or 'deep motive' of selfish gene selection. The scientific event of reading opens for a range of alternative interpretations, where the scientist may 'dream up' solutions that confirm the theory, as in this example:

> Among birds and mammals, these cases of paternal devotion are exceptionally rare, but they are common among fish. Why? This is a challenge for the selfish gene theory which has puzzled me for a long time. An ingenious solution was recently suggested to

[313] Ibid 183
[314] Ibid 303

> me in a tutorial by Miss T. R. Carlisle ... Because of the diffusion problem, the male must wait until the female spawns, and then he must shed his sperm over the eggs. But she has had a precious few seconds in which to disappear, leaving the male in possession and forcing him on to the horns of Trivers' dilemma. So this theory neatly explains why paternal care is common in water but rare on land.[315]

While an end note to the second edition informs that the reader this thought-experiment turned out not to stick in scientific testing, the 'ingenious' and 'neat' explanation illustrates the reading process directed towards the revelation of a general pattern: the "continuities that are recognized"[316] within the framework of the selfish gene theory. The theory, then, on the one hand opens for post-rationalizing explanation of natural phenomena, while on the other, it imposes a restrictive framework of interpretation, as in this example:

> In species that live in herds or troops, an orphaned youngster may be adopted by a strange female, most probably one that has lost her own child … In most cases we should probably regard adoption, however touching it might seem, as a misfiring of a built-in rule. This is because the generous female is doing her own genes no good by caring for the orphan. She is wasting time and energy which she could be investing in the lives of her own kin, particularly future children of her own. It is presumably a mistake that happens too seldom for natural selection to have 'bothered' to change the rule by making the maternal instinct more selective.[317]

The designation of natural selection as an economically rational actor (notwithstanding the inverted commas renouncing any reference to actual consciousness) leaves only the interpretive alternative of a 'misfiring of a built in rule'. Notably, the interpretation gains credibility in the offhand remark 'touching as it may seem', reinforcing the status of the selfish gene theory as the realistic and clear-thinking alternative opposing sentimental wishful thinking. Thus, the uneconomical behaviour of adoption, which contradicts the deep motive of nature, is rationalized within the theoretical framework, and irrationality as a natural phenomenon is excluded.

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[315] Ibid 155-156

[316] Foucault "What is an Author?" 203

[317] *The Selfish Gene* 101

While the narrator goes on to present an example of monkey mothers stealing babies from other females and rearing them, an "example that is so extreme that you might prefer to regard it not as a mistake at all, but as evidence against the selfish gene theory",[318] Dawkins sees it as

> a double mistake since the adopter not only wastes her own time; she also releases a rival female from the burden of child-rearing, and frees her to have another child more quickly ... We need to know how often it happens; what the average relatedness between the adopter and child is likely to be; and what the attitude of the real mother of the child is ...[319]

The challenge seems to be that of coming up with a rationally satisfactory underlying motivation for the kidnapping: "is it, after all, to [the real mother's] advantage that the child *should* be adopted; do mothers deliberately try to deceive young naïve females into adopting their children? (It has also been suggested that adopters and baby-snatchers might benefit by gaining valuable practice in the art of child-bearing.)"[320] These fundamentally hypothetical speculations are supported by the direct transition to cuckoos, well-known for laying eggs in other birds' nests, and thus demonstrating an example of "deliberately engineered misfiring of maternal instinct."[321] Again, by means of transition, recognition takes the place of argument.

The essential question in both the example of paternal care in fish and in the discussion of adoption is *why?* Why do monkeys adopt; why do fish expose paternal care? The framework of the selfish gene theory determines whether the essential question should be *why?* or *why not?* Thus, its overarching perspective defines what it means to 'ask the right question', an idea which is amply discussed in the last of the additional chapters in the second edition. Here, the selfish gene as independent agent is illustrated by the phenomenon of segregation distorters: genes that have mutated to increase their own spread in a given

[318] Ibid
[319] Ibid 102
[320] Ibid
[321] Ibid

population, even if they have a negative effect on the body in which they sit.[322] One might say, then, that the gene and the body are having a conflict of interests. The conflict is illustrated by the emergence of gene *t* in mice which has the effect either of early death or of sterilization, with the potential effect of causing a population of mice to go extinct.[323] The appropriate question in discussing this phenomenon, according to the selfish gene theory, is not *why?* but rather the opposite: "Although segregation distorters exist they aren't very common. We could go on to ask why they aren't common ... We'll find that the answer drops out once we have understood why organisms exist anyway."[324] Defining the right question is a crucial aspect of gaining power of definition:

> Questions about life are conventionally questions about organisms. Biologists ask why organisms do this, why organisms do that. They frequently ask why organisms group themselves into societies. They don't ask – though they should – why living matter groups itself into organisms in the first place. Why isn't the sea still a primordial battleground of free and independent replicators? Why did the ancient replicators club together to make, and reside in, lumbering robots, and why are those robots – you and me – so large and so complicated?[325]

The argument is back to where it started in Chapter One, "Why are People?" – published 13 years before the second edition, but this time it is posed with greater force, since it is no longer introducing a novel perspective, but extending and elaborating on the same idea. These questions thus represent the new perspective, in opposition to the old and dated views of biology, as is clear from the subsequent assertion: "To solve our problem, we have to begin by purging our minds of old attitudes that covertly take the individual organism for granted; otherwise we shall be begging the question."[326] Old attitudes stand in the way of the new and progressive perspective of the selfish gene theory. Towards the end of the additional chapter

[322] See 235-237
[323] Ibid 236
[324] Ibid 237
[325] Ibid
[326] Ibid

of the second edition, the 'narrative of nature', the narrative perspective usually adopted in popular science, becomes merged with a notion of scientific process as a linear movement of progress. The two constitutes and supports the argumentative 'narrative of science' in mutual reinforcement:

> At some point in the evolution of life on our earth, this ganging up of mutually compatible replicators began to be formalized in the creation of discrete vehicles – cells and, later, many-celled bodies. …
>
> This packaging of living material into discrete vehicles became such a salient and dominant feature that, when biologists arrived on the scene and started asking questions about life, their questions were mostly about vehicles – individual organisms. The individual organism came first in the biologist's consciousness, while the replicators – now known as genes – were seen as part of the machinery used by individual organisms. It requires a deliberate mental effort to turn biology the right way up again, and remind ourselves that the replicators come first, in importance as well as in history.[327]

The normative effect is extensive and renders the assumptions on which the selfish gene theory rests universal, a condition for all biological research; with the selfish gene theory, biology has been 'turned the right way up again'. The progressive and linear progress of science is mirrored in the progressive and linear genetic development – hence the affirmative quality of the narrative is doubled. Elsdon-Baker comments on the normative effect of the depiction of science as linear progress:

> It is all too easy to paint a picture that seems to show that we have marched inevitably towards a modern gene-centric model of evolution. But is this really the case? This kind of progressionist history can serve only to reinforce the perspective of researchers today. In some ways it can act to reinforce dogma and constraint debate – after all, nobody wants to be labelled as being part of an anti-Darwinian or a Lamarckian tradition.[328]

The suggestion that the selfish gene theory may have the effect of 'constraining debate', as proposed elsewhere in this thesis, concerns the effect on the general public. *The Selfish Gene*'s merging of the personal sphere with scientific theory may have the effect of

[327] Ibid 265

[328] Elsdon-Baker *The Selfish Genius* 100–101

establishing a public scientific common sense. Moreover, the assumptions and implications of the selfish gene theory, when depicted as the only sensible perspective on evolution, may constrain the range of potential biological explanation. While constraint is to some extent necessary for all research, the question is whether the restrictions that the selfish gene theory imposes are productive.

Somewhat paradoxically, the representation of the selfish gene theory is also problematic due to the notion of revealing a universal principle, the endeavour to "make everything fall into place in the heart as well as in the brain."[329] As Dawkins points out in a response to criticism in an end note to a fundamental assumption behind the theory:

> My wager that all life, everywhere in the universe, would turn out to have evolved by Darwinian means has now been spelt out and justified more fully in my paper "Universal Darwinism" and in the last chapter of *The Blind Watchmaker*. I show that all the alternatives to Darwinism that have ever been suggested are in principle incapable of doing the job of explaining the organized complexity of life. The argument is a general one, not based upon particular facts about life as we know it. As such it has been criticised by scientists pedestrian enough to think that slaving over a hot test tube (or cold muddy boot) is the only method of discovery in science. One critic complained that my argument was 'philosophical', as though that was a sufficient condemnation. Philosophical or not, the fact is that neither he nor anyone else has found any flaw in what I said. And 'in principle' arguments such as mine, far from being irrelevant to the real world, can be *more* powerful than arguments based on particular factual research.[330]

One reason why the 'in principle' arguments of *The Selfish Gene* are indeed powerful is that they are not easily disputable, because they are based in an inner logic and persuasive rhetoric rather than on scientifically verifiable evidence. While some aspects of the selfish gene theory as presented in the book undoubtedly have scientific value and have influenced biology, its all-embracing scope, in combination with a perspective which excludes alternative answers as marginal, in sum exercises an imposing power of definition with regard to what should be

[329] *The Selfish Gene* xvi
[330] *The Selfish Gene* 322

deemed 'acceptable science'. The hypothetical 'in principle' presumes a scientific warrant of truth without adhering to a scientific method which is the required validation of such truth.

On a personal level, the aspect of personal recognition and identification as a structural component gives the book an intrusive effect, which can be said to go beyond the scope of the scientific mandate of assertion. In the process of unfolding the 'fundamental rationale of the gene' – a perspective which in scientific terms may be seen as either speculative or in productive, depending on whether or not it is evaluated as 'good poetic science' – this rationale becomes inscribed as Meaning of Life. The aim to produce an exhaustive explanation for Life, and therefore also an exhaustive definition of the Meaning of Life, has been criticised as totalitarian and arrogant, but may equally well be labelled naïve. The Darwinism of *The Selfish Gene*, then, is fundamentally different from the Darwinism of the *Origin*:

> The imaginative release into a continuing and undescribed future is remarkable when it is set alongside the positivistic emphasis on *finality* which we find in Comte, a suggestion that the positive and scientific have now achieved mastery and that the world may fully and definitively be described forever. Darwin persistently emphasises physical process, not completed idea.[331]

Conclusion:

In this analysis I have shown how *The Selfish Gene* can be read as a many-layered work which operates on several levels of meaning. On a purely scientific level, Dawkins's book has come to represent the shift within the community of evolutionary theory from the idea of natural selection working for the good of the species, to a gene-centred view of evolution. As mentioned, this perspective does not originate with Richard Dawkins; rather, *The Selfish Gene*

[331] Beer *Darwin's Plots* 58

serves to promote this perspective, aiming to elaborate the concept and bring together the views of scientists like Fisher, Hamilton, Williams, Trivers and Maynard Smith in a new perspective on evolutionary theory.

Hamilton, in a review of Dawkins's book, has referred to this perspective as a new reading of nature, a conception which I have elaborated above. The notion of the selfish gene theory as a reading of nature opens for two insights: In an exhaustive reading aiming to make 'everything fall into place in the heart as well as in the brain' as I have discussed above, Neo-Darwinism is presented as the one valid approach to evolutionary theory. In consequence, nature is presented as corresponding to human reason and logic, a complete entity open to unequivocal interpretation and deciphering. Thus, it can be argued that *The Selfish Gene* comes to promote a positivistic, Comtian notion of a completed, and all-encompassing, theory of Life.

Within this scheme, I have argued that the selfish gene theory as a 'reading of nature' fails to acknowledge that reading must necessarily be selective and therefore cannot aspire to be exhaustive. This claim does not mean that all readings are equally valid, but rather that two readings are not necessarily mutually exclusive. Also relevant for this problematization is Beer's definition of reading as an *essentially question-raising procedure* as discussed in the introduction above. *The Selfish Gene* is concerned with defining 'the right question', as I have argued in Chapter 3 above. Upon examination, these questions seem to be formulated in accordance with a pre-supposed answer. Thus, the explanations that *The Selfish Gene* offers take the form of post-rationalisation of animal behaviour, based in an assumption of the phenotype as an automatic and linear expression of the genotype, as I have discussed in chapter 2.

Whether it is representational or methodological, this assumption, along with the purpose-bound definition of the gene as a 'unity of convenience' fulfils the Third Culture

ideal of ‘clarity of language’, and what the biologist Alan Grafen, in his reading of *The Selfish Gene* (in 1.2 above) recognizes as a ‘transparency of exposition’. The transparency of the scientific representation suggests an unequivocal, straightforward meaning which literary textual strategies illuminate and extend in accordance with the notion of good poetic science. Within this scheme, literary strategies are not seen as carriers of meaning in themselves other than as means of facilitating understanding and fuelling scientific creativity and innovation.

However, the idea of a purely scientific message requiring a straightforward reading, in effect a reading which would purge the text of its literary ‘sugar-coating’, stands in stark contrast to the emotional appeal of poetic science. As we have seen, ‘good poetic science’ may “conjure in the mind images and allusions that go beyond the needs of straightforward understanding” and “explain something so that the reader feels it in the marrow of his bones”. The tension between the demands of a detached, scientific reading and the emotional appeal of *The Selfish Gene* is illustrated by the construction of an ideal reader who is instructed to modify the meaning potential of the textual strategies of personification and identification. While on the one hand addressing the reader on an emotional level, playing on personal recognition, the narrator dismisses this address by instructing the reader to *unread* the anthropocentric relevance as well as the notion of intention that is inscribed in the personification of genes and vehicles. Thus, the text appeals to an intuitive understanding, but also checks and ‘edits’ this intuitive understanding.

As I have argued in the my analysis, the duality of recognition on the one hand and the insistence on the merely metaphorical quality on the other – the plea to the reader to believe and not to believe, to read and not to read at the same time – has the potential to evoke in the reader a ‘willed suspension of disbelief’. These textual strategies make possible, through recognition, the transition from the ‘hypothetically possible’ to the ‘actual’ in Dawkins’s text. This transition can be said be enforced by the use of social analogy as merely illustrative

device, leaving unread the presumptions on which the analogy, in particular social analogy, is based. Recognition, then, becomes meaning-governing, and in consequence, social circumstances become naturalized, while natural phenomena come to reflect social organization in what Rodgers terms a 'loop of legitimation'.

In my analysis of what Dawkins refers to as the genetic rationale, I have claimed that the loop of legitimation is crucial for his argumentation, to the extent that it may be read as a case of 'bad poetic science' where the writer becomes seduced by his own literary devices. *The Selfish Gene* moves rapidly between the hypothetical and the factual, between the material and the abstract, and as a result, the literary devices, such as analogy, are not always easily distinguishable from the argumentative structure. A further example of this confusion is the narrative of nature within which the gene, or replicator, is presented. While this textual strategy is initially introduced as a hypothetical organizing principle, it becomes, through the course of the book, a constitutional element supporting the argument – Myer's narrative of science. The fusion of these two modes of narrativity, as I have shown in 3.4 above, gains added argumentative force when the notion of science as a linear process of progression is invoked with the claim that biology with the selfish gene theory has been turned 'the right way up again'.

The somewhat authoritative methodological control that the narrator exercises, which, I have argued, makes possible the construction of an ideal reader supporting a polemical representation of science, can be seen as based in an assumption of the (lay-)reader as an ideal reader passively absorbing scientific claims. This particularly regards the appeal to the reader to *unread* certain elements of meaning, and thus take on the responsibility of reading the text in accordance with its intended meaning. This textual strategy should be seen in relation to the PUS-model (Public Understanding of Science) of science communication, which aims to educate a generally uninformed 'public'. PUS has been increasingly challenged by the PEST-

model (Public Engagement in Science and Technology), which Elsdon-Baker promotes.[332] An important difference between the two models is the conception of the 'public', which from a PEST point of view includes "a vast array of people, from school-children right through to scientists from other disciplines, and even those who themselves work in science communication or even science policy."[333] In short, the PEST-model focuses on dialogue, while the PUS-model gives emphasis to public enlightenment. With this in mind, the democratic endeavour of Third Culture – as presented in the discussion above – the notion of 'public scientists communicating directly with the public,' and thus representing a democratic distribution of knowledge, through popularization or 'public science,' becomes questionable.

Through his professional status, Dawkins as a public scientist represents an authority on the question of how public science should be read. On the grounds of this authority, readings paying heed to the representational structure of public science books like *The Selfish Gene* may be effectively marginalized and dismissed as misreadings, as demonstrated by the polemic between Dawkins and Midgley when the book was first published. Furthermore, the polemic depiction of all criticism as 'constructivist' and of critics as ill-willed pedants contributes to a self-proclaimed power of definition. In order to take a more general approach to this issue, it could be productive to take into consideration the field of Scientific Literacy, which Dawkins is currently teaching at the New College of Humanities, and pose the questions: Who defines what constitutes Scientific Literacy? Is Scientific Literacy the ability to filter a work of 'public science' of textual strategies and absorb only a 'straightforward meaning'? Or is it the ability to perform a critical reading of scientific works? On the background of this thesis, I would suggest that the recognition of textual strategies and their

[332] Elsdon-Baker 2009, 227
[333] Ibid 228

effect on scientific representation may productively be included in the concept of Scientific Literacy.

Addressing the notion of 'poetic science,' one might ask whether the textual strategies of allusion and conjuration rest on, and thus consequentially establish, a specific common sense when they seen as mere illuminating devices. One way of exploring this issue could be to invoke the question: can 'public science' be said to establish modern myths? The zoologist Peter Medawar, in his Romanes lecture "Science and Literature," separates between "commonsensical or scientific truths" and "truthlike structures" of myths which are "excused from public examination"[334]:

> [A] myth, especially if it appeals to magical agencies – will be judged true if it is all of a piece, hangs together, doesn't contradict itself, leaves no loose ends, and can cope with the unexpected. No single word in common speech describes this set of properties, *but a narrative or theory or world picture or imaginative structure of any kind* which answers to them is said to 'make sense', to have the property of being *believable-in.* All scientific theories must make sense, of course, but in addition they are expected to conform to reality, to be empirically true. It is the relaxation of this condition, or the failure to enforce it, that opens up to us a world that is larger, more various, and perhaps more doctrinable than real life[335].

In my analysis above, I suggested that *The Selfish Gene* comes to project to natural selection what Foucault terms a 'deep motive' of inherent rationality to natural selection, and I have showed how this deep motive is constituted by social analogy. The construction of this deep motive can be said to correspond to the mythic qualities that Medawar distinguishes of 'a narrative or theory or world picture or imaginative structure of any kind', notably in addition to scientific facts. This mythic aspect of *The Selfish Gene*, when read into Medawar's argument, may thus contribute to a public common sense because it carries with it the potential of being 'more doctrinable than real life' or, in this context, more doctrinable than its

[334] Ibid 56
[335] Ibid 55

purely scientific message. By extension, one might ask whether the genre of 'public science' in addition to, or as a result of, opening for the incorporation of literary devices in scientific texts, also opens for a 'relaxation of the scientific demand of empirical truth' that Medawar recognizes – a relaxation which is elusive because it is juxtaposed to scientific facts.

In order to further explore this question, the view of science that is promoted in Dawkins's *Unweaving the Rainbow* could be addressed. In this book, the 'scientific gaze' is employed on matters like Law and poetry, and it is here that the notion of poetic science is introduced. A closer reading of this work might contribute to a development of the notion of poetic science which could be applied on further literary studies of 'public science.' Additionally, it might be interesting to analyse the specific 'scientific gaze' that *Unweaving the Rainbow* operates with, considering, as I hope this thesis have established, that 'science' is not an unequivocal denotation of a singular and clearly defined approach to the world.

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