Tracking the fate of the metaphor *silent spring* in British environmental discourse: Towards an evolutionary ecology of metaphor

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Abstract

The images and metaphors used in debates about the risks and benefits associated with cloning, genetically modified (GM) food and genomics have been relatively well researched. There have been less detailed studies of the metaphors and images used in the debate about agriculture and the environment. To fill this gap this article will explore how the 1960s book and the metaphor *silent spring* (Carson 1962) were rhetorically and politically exploited in British environmental, ecological and agricultural discourses between 1998 (a date that coincides with the height of the debate over cloning and GM food) and 2002 (a date that coincides with the height of the debate over the human genome, as well as the debate over sustainable agriculture). The first part of this article will be devoted to discussing the significance of *silent spring* in its past and present political, scientific and literary contexts. The second part will analyse the rhetorical and argumentative uses made of *silent spring* in British broadsheets and scientific journals in three types of debates: the debate about pesticides and their threats to birds and humans (where environmental and agricultural discourses intersect); the debate about GM food (where genetic, agricultural and environmental discourses intersect); and the debate about foot and mouth disease (where agricultural and environmental discourses intersect). This article closes with an appeal for an ecological study of metaphor.

Die Bilder und Metaphern, die in Debatten um die Risiken und Vorteile des Klonens, von genetisch modifizierten Nahrungsmitteln und der Genomik verwendet werden, sind relativ gut erforscht. Weniger gut erforscht sind die Metaphern und Bilder, die in Debatten um die Landwirtschaft und die Umwelt benutzt werden. Um diese Lücke aufzufüllen, wird dieser Artikel analysieren, wie das Buch und die Metapher ‘der stumme Frühling’ (Carson 1962) rhetorisch und politisch in Großbritannien in Debatten um die Umwelt, Ökologie und Landwirtschaft verwendet wurden, und dies zwischen 1998 (als die Debatte um genetisch modifizierte Nahrungsmittel ihren Höhepunkt erreichte) und 2002 (als die Debatte um das menschliche Genom und um umweltverträgliche Landwirtschaft ihren Höhepunkt erreichte). Der erste Teil dieses Artikels situiert die Metapher ‘stummer Frühling’ im politischen, wissenschaftlichen und literarischen Kontext der 60er und 90er Jahre. Der zweite Teil ist der Analyse des Gebrauchs dieser Metapher in britischen Tageszeitungen und wissenschaftlichen Zeitschriften gewidmet und erforscht diese Verwendung in drei Arten von Debatten: die Debatte um die Pestizide und um die mit Pestiziden verwundenen Gefahren für die Vogelwelt, die Umwelt und die Menschen (hier kreuzen sich Umwelt- und landwirtschaftliche Diskurse); die Debatte um genetisch modifizierte Nahrungsmittel (hier kreuzen sich Diskurse um die Genetik, Umwelt und Landwirtschaft); und die Debatte um Maul- und Klauenseuche (hier kreuzen sich Umwelt- und landwirtschaftliche Diskurse). Der Artikel endet mit einem Appell für eine ökologische Analyse der Metaphern.

> "Floods. Foot and mouth. Global warming. BSE. Pollution. GM foods. BSE. Soil degradation. If you want to be in at the sharp end of scientific and social debate in the next 10 years then agriculture and environment are bound to be among the hottest important subjects." (Vidal 2001)

1. Introduction[1]

The images and metaphors used in debates about the risks and benefits associated with cloning, genetically modified (GM) food and genomics have been well researched (see Nerlich et al. 1999, 2000, 2001, 2002a; Kidd/Nerlich (eds., in prep.) where references to further literature can be found). There have been less detailed studies of the metaphors and images used in the debate about agriculture and the environment (but see Nerlich et al. 2002b, Nerlich in press, and the work done by ecolinguists, e.g. Fill and Mühlhäusler 2001; Harré, Brockmeier and Mühlhäusler 1999; Trampe 1991).

To fill this gap, this article will explore the 'life and work' of one salient environmental metaphor, namely *silent spring*, based on the 1960s environmental bestseller *Silent Spring* by Rachel Carson (Carson 1962/2000). This book alerted scientists, the media and the general public to the dangers associated with the indiscriminate use of pesticides, such as DDT, to wildlife, humans and the environment. In this article I want to examine how the book and the metaphor were rhetorically and politically exploited in British environmental, ecological and agricultural discourses between 1998 (a date that coincides with the height of the debate over cloning and GM food) and 2002 (a date that coincides with the height of the debate over the human genome, as well as the debate over sustainable agriculture).

The first part of this article will discuss the significance of *silent spring* in its past and present political, scientific and literary contexts. The second part will analyse the rhetorical and argumentative uses made of *silent spring* in British broadsheets and scientific journals in three types of debates: the debate about pesticides and their threats to birds and humans (where environmental and agricultural discourses intersect); the debate about GM food (where genetic, agricultural and environmental discourses intersect); and the debate about foot and

[1] I would like to thank Roslyn Frank for helping me to give this paper some theoretical depth. Thanks also to Peter Mühlhäusler for his helpful comments on an earlier draft of this paper. All remaining errors and aberrations are of course my own.

mouth disease (FMD) (where agricultural and environmental discourses intersect). This might contribute to a better understanding of the ways in which popular culture and science interact in framing public attitudes towards the environment and to a better understanding of how metaphors are established and changed in political and social discourse. At the end of the article I will use the results of this research to appeal for a new approach to metaphor, the ecological study of metaphor, which focuses on how metaphors interact with their environments of use and how they adapt and change through this interaction.

2. Silent spring in context

The book *Silent Spring*, published 40 years ago by Carson, an American writer and scientist (see Lear 1997 for her biography), dealt with the long-term dangers of chemical pesticides, used widely by farmers and gardeners to kill insects or pests, to plants, animals and humans (for a more detailed description of the development and uses of DDT from the second World War onwards, see: http://onlineethics.org/moral/carson/2-DDTuse.html, accessed April 2003). *Silent Spring* "made people think about the environment in a way they never had before" and "introduced to the general imagination the idea of ecology."[2] Forty years later, in the spring of 2001, a *BBC* news report on the FMD epidemic in the UK proclaimed: "Spring 2001 will go down in history as a disastrous period for our farming and tourism industries. After the cull comes an eerie silence - described by one Cumbrian farmer as a *silent spring* as he surveyed his empty fields following the slaughter of his sheep." ("Silent Spring" website: http://www.bbc.co.uk/england/silentspring/, accessed April 2001)

When *Silent Spring* was published in the 1960s, it sparked fears about a global environmental catastrophe, fears that were exacerbated by other developments, such as the development of the atomic bomb, the cold war, and the space race – all events associated with networks of images, metaphors and stereotyped arguments into which *Silent Spring* fitted neatly, both as a book, a book title and as a metaphor.

As Linda Lear reports in her seminal book about Rachel Carson's life and work, *Rachel Carson: Witness for Nature*, Carson had initially been unsure about what title to give to her book. Indeed, "Silent Spring" had first been intended to be just a chapter title. However, Marie Rodell, her literary agent, saw its potential as a general title for the book as whole. In

[2] http://www.pbs.org/wgbh/aso/databank/entries/dt62si.html (accessed June 2001).

order to convince Carson, she found some lines from a poem by the English Romantic poet John Keats, which, as Lear writes, "amplified the title of Silent Spring beautifully" and served as one of the epigraphs for the book: "The sedge is wither'd from the lake,/ And no birds sing" (Lear 1997: 389). The second part of this verse became in turn a famous chapter title in *Silent Spring* (echoed, for example, in the title of Waddell ed. 2000).

The phrase *silent spring* is a counterfactual blend and auditory metaphor that represents the anticlimax following failed expectations and dashed hopes and cancels the tacit assumption that spring should be full of life, hope and joyful sounds. The network of meanings surrounding this blend feeds on a variety of connotations, synonyms, antonyms and figurative extensions. It also draws on knowledge of literary traditions and political events so as to achieve its main rhetorical effect: to signal a deep threat to the environment. In association with *spring* the word *silent* evokes death, the end of nature, the unnatural and artificial, emptiness and sterility,[3] whereas *spring* is usually associated in western culture with birds singing, new beginnings, life, unspoiled nature, and wilderness. Silence in western culture has mainly negative, even menacing connotations.[4] The two words *silent* and *spring* also establish links to western literary traditions, which either romanticise nature or project dystopian visions of nature destroyed, and to scientific and political events, which were different but at the same time similar for the 1960s and the 1990s (see figure 1).

During the 1960s science was progressing fast, not only in relation to the use of chemical pesticides, but also on the biological front after the discovery of the structure of DNA in 1953. On the one hand DNA enveloped genetic science with a mantle of mystique (Nelkin 1995); on the other hand advances in *in vitro* fertilisation, the contraceptive pill, and early cloning research inspired Taylor's 1968 book *The Biological Time-bomb* (Taylor 1968). Just like Carson's work, which alerted the general public to the dangers of biochemical advances, this work alerted the public to some of the dangers inherent in biotechnological and genetic advances. Both Carson's and Taylor's books grabbed the public imagination and inspired sci-

[3] This is different when *silent* is associated with *night*, as in *silent night*, when it evokes peacefulness and holiness.

[4] It would be interesting to see how Carson's book title has been translated in other cultures where other connotations may prevail. Another topic worth reflecting on is the way *silent spring* resonates with those in western societies who spend inordinate amounts of time and money on feeding wild birds in their back gardens and to whom the dawn chorus is a symbol of their success in doing their bit for the environment and the bird population, as opposed to those in western societies who live in big cities and to whom birds, such as pigeons, are just a nuisance. Obviously, there will be still others who live in countries where songbirds don't wake you up in the morning, where they are not valued in the same way as they are in the English suburbs, and for whom therefore the metaphor *silent spring* has either a very different appeal or no appeal at all.

fi spin-offs, such as Ursula Le Guin's 1969 essay *Nine Lives* (Le Guin 1969/1970)[5] and Frank Herbert's *The Green Brain* (1966).

> […] Herbert imagines the insect world rising up against the global application of industrial pesticides, developing not only effective resistance in the physical sense but also a collective consciousness capable of reason, communication, and political resistance. (Killingsworth and Palmer, 2000:192)

This was the beginning of a new literary tradition of apocalyptic narratives and of the new genre of the ecocatastrophe, inspired both by the threat of the atomic bomb and a growing ecological awareness.

At the same time Paul Ehrlich published another book that played with the image of the bomb: *The Population Bomb* (Ehrlich 1968). Many of the topics tackled by Ehrlich overlapped with Carson's interests, especially the effects that humans have on nature, such as deforestation, overfishing, chemicals in the atmosphere, the toxification of the environment and the human body (what Nicola Baird called "a toxic time bomb" in an article for *The Guardian* referring to *Silent Spring*, 25/09/02), and, of course, the exponential growth of the human population. Unlike Taylor and Ehrlich, who used the metaphor of the *(time) bomb* to focus on the explosive and potentially risky growth of scientific knowledge on the one hand and of the world's population on the other, Carson's metaphor of *silent spring* focused on the possible outcome of such events, namely the silence that follows, implicitly evoking the cold and deathly image of *nuclear winter* – another seasonal metaphor that permeated 1960s public discourse, dominated by the image of the atomic bomb.

Whereas the 1970s became a decade of environmental activism, the 1980s and early 1990s were a time of scientific and technological euphoria, the end of the cold war and a time of a global economic boom. References to *silent spring* diminished (how much or how little will have to be ascertained) and it was only during the 1990s that *silent spring* re-emerged as a central symbolic reference point. At the height of the debate about GM food the phrase fanned fears that soon it would be "the year 2020 and the most silent of silent springs, apart from the rustle of genetically engineered oilseed rape, wheat, maize and other 'designer' crops nodding in the breeze..." (Nuttall, *The Times*, 13/7/98, p. 15). At the end of 1999 the development of a

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[5] "Le Guin presents in *The Word for World is Forest* (1972) the conflict of an extractive, industrially oriented culture of earthlings who undertake to colonize a new planet for the sake of logging so that wood, now a precious commodity on the earth, can be returned via space freight at a huge profit." (Killingsworth and Palmer 2000:193).

genetically modified tree was announced as "Silent Spring 2: The Terminator tree"[6] alluding at one and the same time to Monsanto's famous terminator seeds and to the 'terminator' movies with Arnold Schwarzenegger.[7] Groups opposed to genetic engineering as well as 'serious' scientists, such as Sir John Krebs, who studied the effects of intensive farming on common birds (Krebs et al. 1999), have used the title and imagery of *silent spring* ever since in various argumentative contexts, together with allusions to other literary and scientific sources.

Worries about the environment and health have increased over recent years after a series of health and food scares, such as E-coli, salmonella, and BSE or so-called 'mad cow disease' (Bovine Spongiform Encephalopathy, a cattle disease that might be linked to vCJD or variant Creutzfeldt-Jakob Disease, a debilitating brain disease in humans). In this context the 1997 announcement that a sheep named Dolly had been cloned unleashed a torrent of dystopian cultural imagery (Nerlich et al. 1999). Since then genetic engineering has been compared to Chernobyl (Bremner 1999) and xenotransplantation has evoked images of a 'genetic time bomb' (Bryan 2001) – replacing the atomic bomb and the biological time bomb of the sixties. To dispel some of the fears about genetic science going too far, scientists and politicians heralded the decipherment of the human genome or 'book of life' as the year 2000 equivalent of the moon landing (see Nerlich et al. 2002a), just as in the 1960s scientists might have hoped to allay the fears provoked by *Silent Spring* and other books by really sending men to the moon. In both cases landing on the moon, literally or metaphorically, might have been used as an icon of scientific achievement to counter fears of science gone too far.

[6] http://www.sw-center.org/swcbd/alerts/196-613.html (accessed (June 2001)

[7] Monsanto is the US seed and pesticide giant that tried to undermine the message of *Silent Spring* in the 1960s by distributing 5,000 copies of a brochure parodying *Silent Spring* entitled *The Desolate Year* that describes a world of famine and disease, where insects have taken over because chemical pesticides have been banned. In the 1990s Monsanto was at the forefront of GM technology. It also tried and failed to market sterile seeds, so called terminator seeds.

Figure 1

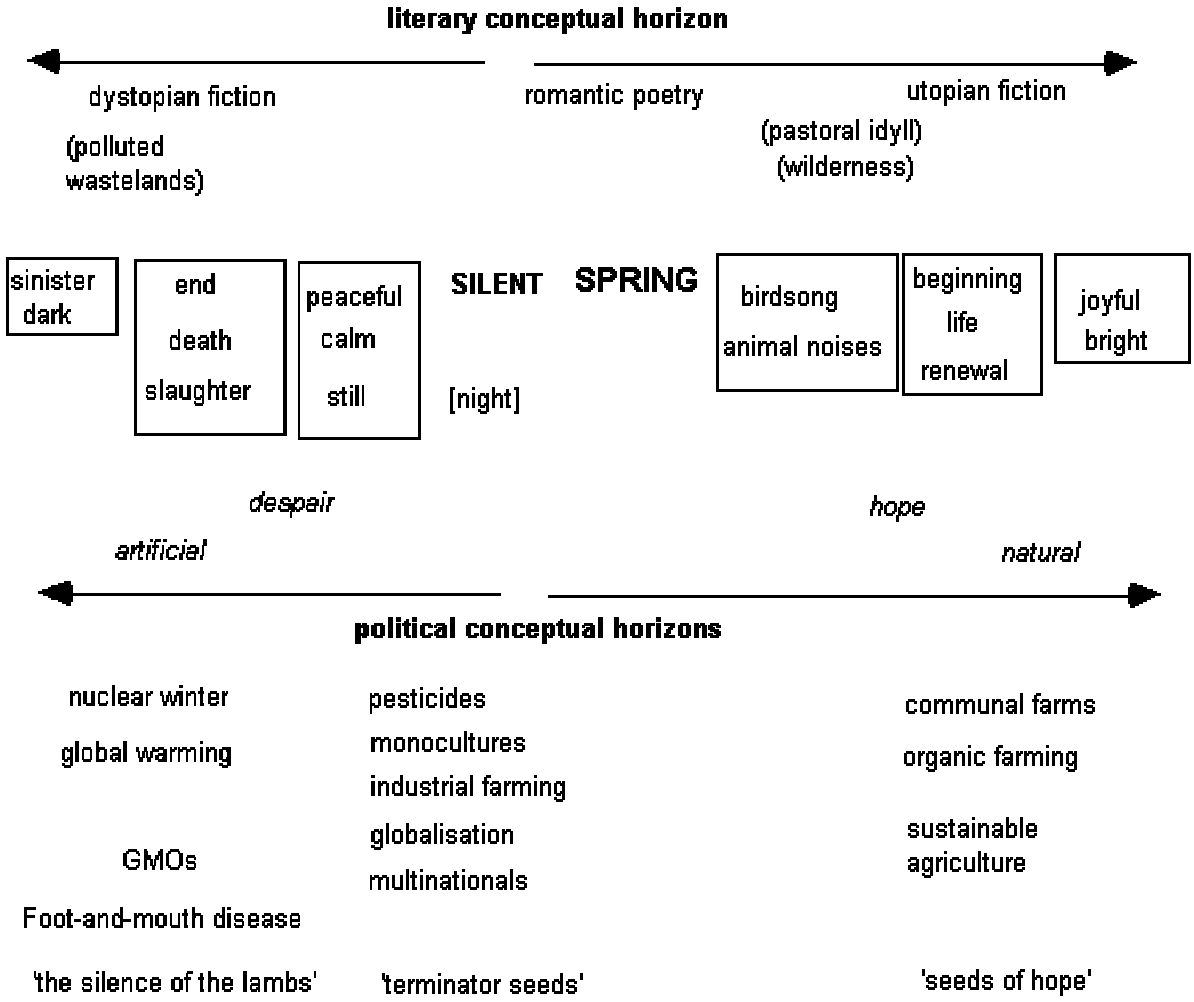
Science:	**hopes**	**fears**
1960s	(real) moon landing	atomic bomb
		biological time bomb
		population bomb
		silent spring/pesticides
1990s	'moon landing'/genome	BSE
		toxic time bomb
		genetic time bomb
		silent spring / GM food-FMD

However, then as now parts of the general public were not convinced of the benefits promised by scientific advances and, as a result, focused more on the associated risks. This renewed focus on risks happens to coincide, as during the 1960s and 70s, with threats of global war, environmental disasters, possibly caused by global warming, and the new threat of global terrorism, especially bioterrorism. Consequently, now as then the war metaphor pervades discourses that also use the metaphor of *silent spring*.

In 1962, as in 2002, a movement began to emerge of people who did not wish to land on the moon, either literally or metaphorically, but rather wanted to go back to an imagined 'wilderness' or 'back to nature', not to make war on nature but to become an integral part of it. These people fear the end of nature (see McKibben 1990) and the end of humanity as we know it; the future they envisage (again) is a silent world "full of plastic, concrete and electronic robots" (Prince Bernhard of the Netherlands, quoted by Lord Shackelton in his introduction to *Silent Spring*, Carson 1962/2000:16).

Over four decades the book *Silent Spring* has thus permeated public consciousness and the image of a silent spring has been used repeatedly as a rhetorical resource and a mine for metaphors and images in debates about the impact of science on society and on the environment.

Figure 2



Future research on a larger scale than this article should study the uses made of *silent spring* over four decades, between 1962 and 2002. This research would have a synchronic as well as diachronic dimension: to discover the polysemous uses of *silent spring* in modern environmental discourse and to examine the various uses of this polysemous title over time. The beginning of this development has been examined in a 'synchronic' study carried out by Gary Kroll in 2001. He distinguishes between three audiences and three messages that *Silent Spring*, the serialised version, the book and the broadcast, had in 1962 and 1963.

> The serialized version of the book was geared to an urban audience, and its salient message was that pesticides posed a threat to the individual's body through ingestion of staple foods coated with cancer-causing chemicals. A suburban "Silent Spring" was manifested by the book itself […], which outlined the dangers presented to personal property, home, and family within the context of a post-war domestic ideology. Finally, the televised "Silent Spring" introduced a mass audience to a philosophical discussion about the problems created when science assumes an arrogant confidence in its ability to control nature. (Kroll 2001:404)

In this paper I slice off the very tip of the metaphorical iceberg that has steadily grown around *silent spring* since 1962 by examining the uses made of the book and the phrase in the period between 1998 and 2002.

2. *Silent spring* in the media

2.1 Material and data collection

Carson's book was one of the most influential popular science books of the 20th century. It demonstrated clearly for the first time that a technology that seems harmless might have serious long-term effects on environment, wildlife, and human health. To study the impact of this book makes therefore good sense, especially at a time when debates rage about the risks and benefits of GM food and when something that seemed harmless, such as feeding cattle meat and bone meal made from sheep infected with scrapie, turned out to be not harmless at all – BSE. *Silent Spring* also highlighted for the first time the seeming complicity between government, industry and scientists which undermined trust in these institutions – a topic still very much with us today, especially with regard to BSE and GM food. The period under study in this article covers the years that followed the cloning debate in 1997 and the GM food debate in 1998 and goes up to the outbreak of FMD in the UK in 2001 and its consequences, with the shadow of BSE hanging over all these debates.

For this pilot study I used the available online material from four British broadsheets and two scientific magazines, one popular, one academic. As some online archives started in 1998 and some in 1999 the data collection has been somewhat uneven. The broadsheets studied were, in order of importance for this project:

> a.) Guardian unlimited (including the Sunday edition of *The Guardian*, *The Observer*):
>
> *The Guardian* is a left-of-centre paper of social and environmental protest. Between 1999-2002 it published 28 articles using *silent spring* in the headline

(twice) and body of the article, of which one was an interview, one a review of *Ecology Magazine*, and three were obituary/commemorative articles.

b.) The Times archive:

The Times is the oldest British national daily and generally regarded as the paper of the establishment. It is conservative, but not as conservative as the *Daily Telegraph*. Between 1998 and 2002 it published nine articles with *silent spring* in the headline (three times) and the body of text.

c.) Electronic Telegraph:

The Daily Telegraph has the strongest conservative outlook. Between 1999 and 2002 it published 8 articles using *silent spring* in the body of the text.

d.) The Independent:

The Independent is the youngest broadsheet leaning slightly to the left, but not as much as *The Guardian*. Between 1999-2002 it published four articles with *silent spring* in the body of the text and once in the headline.

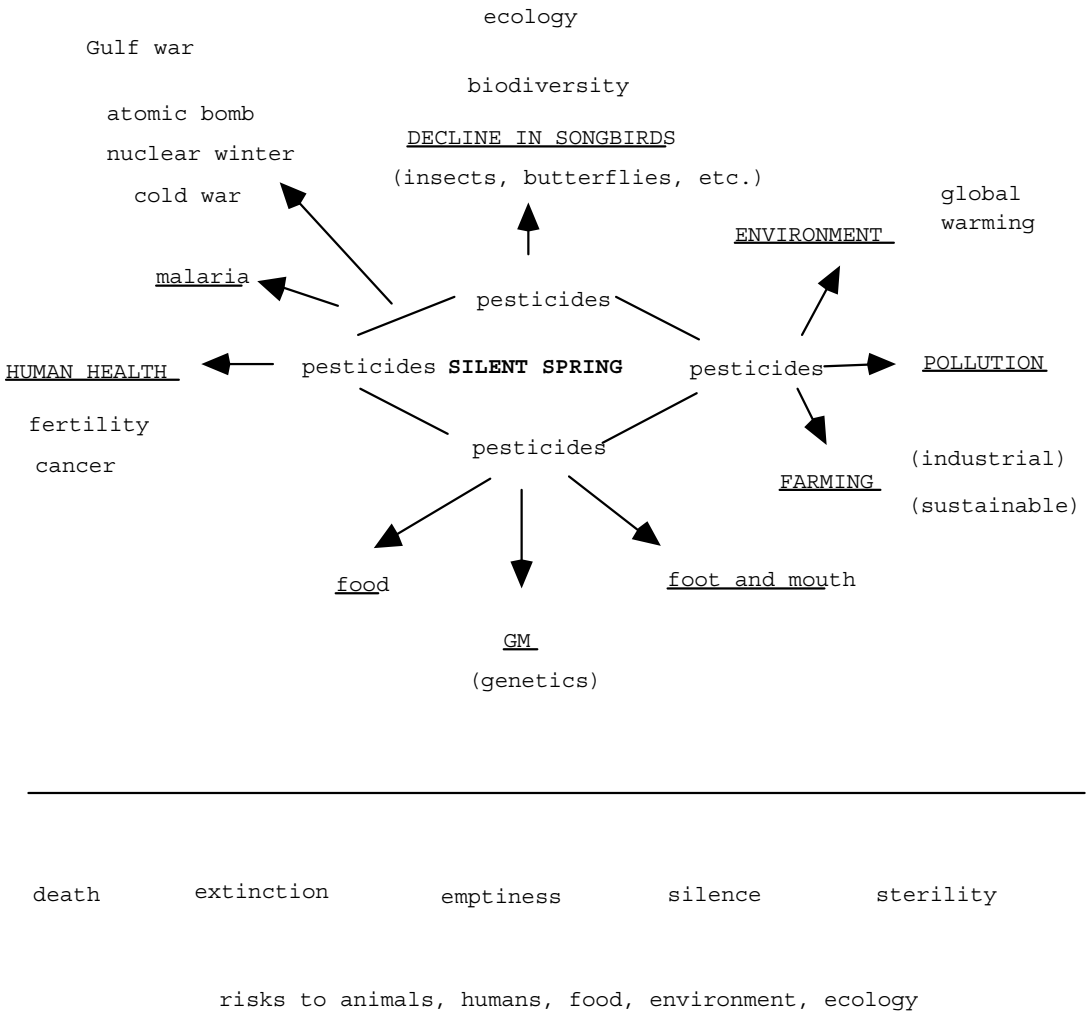
I studied one popular and one 'serious' science journal. The *New Scientist*, which calls itself 'the world's no. 1 science and technology news service', published three articles and three reviews using *silent spring* in the body of the text between 1998 and 2002. *Nature*, "the renowned international weekly science journal launched in 1869"[8], published the same amount of articles and reviews in the same period, one of them using *silent spring* in the title.

Both the broadsheets and the science journals used *silent spring* either as a scientific reference, quoting title, author and date of publication, or as a popular reference with all the associations it has accumulated over time. The main themes discussed by both broadsheets and science journals were the decline of the bird population, the fight against malaria using the pesticide DDT (or not) and genetically modified organisms. Only the broadsheets, not the science journals, used *silent spring* to discuss the topic of FMD. The majority of articles using *silent spring* to describe the effects of FMD appeared in *The Guardian*, whereas two important articles about GM using *silent spring* appeared in *The Times* and two in the science journals. The disappearance of birds was discussed in equal measure in *The Guardian*, the *Daily Telegraph*, *The Times*, and *Nature*.

The spread of all topics can be represented as follows.

[8] See: http://www.macmillan.co.uk/Companyinfo/macmillanuk/magazine.htm (accessed June 2001)

Figure 3



2.2 *Silent spring* as a scientific and popular reference

As already mentioned, both the broadsheets and the science journals used *silent spring* as a scientific as well as a popular reference. They referred to the book to continue the debate about the impact of pesticides and (pest resistant) GM crops on the environment and on human health and they used *silent spring* as a popular reference, cliché or catch-phrase to exploit its many associations with images (silence, death, emptiness, sterility etc.), emotions (fear, sadness, despair) and illocutionary forces (to alarm, alert, warn, etc.). I shall first examine the popular use of *silent spring* by scientists, then by journalists and by the farmers interviewed by journalists.

In 1999 Sir John Krebs, a zoologist, co-authored an article for *Nature*. It discussed the disappearance of birds, the loss in biodiversity and the impact of industrial agriculture on the bird population. The article was entitled: "The second Silent Spring?", using *silent spring* as a popular, easily understood reference. The second section of the article was headed by the question: "Where have all the birds gone?" – a question that Carson had posed in her book as: "The birds, for example - where had they gone?" (Carson 1962/2000:22). Inside the article itself, however, many scientific terms are used, which might not be as easily understood, such as *taxon*[9]. The article thus caters both to in-group readers as well as out-group readers, to environmental activists, biologists and ecologists, as well as to environmentalists and the public at large. After summarising the since Carson well-known effects of organochlorine insecticides, such as DDT Krebs et al. continue:

> The new losses in biodiversity are sometimes called the 'second Silent Spring'.[10] However, although they are associated with the intensification and industrialization of agriculture, they involve more subtle and indirect effects than the poisoning of wildlife by pesticide residues. In general terms, intensification is about making as great a proportion of primary production as possible available for human consumption. To the extent that this is achieved, the rest of nature is bound to suffer.
>
> Detailed ecological studies have shown the devastating effect of the intensification of agriculture on biodiversity. Here we summarize some of the key results, taking birds as our illustrative taxon, and link them to the broader issues of society's choices about the kind of landscape and environment it wishes to bequeath to future generations. (Krebs et al. 1999:611)

This debate about the decline in bird population was pursued in the broadsheets with other, more poetical means, as we shall see. Meanwhile, the debate about the intensification of agriculture and its consequences for animals and the environment deepened after the outbreak of FMD in the UK, which was often rightly or wrongly linked to the effects of industrial agriculture (see Nerlich, in prep.).

The popular, as opposed to the scientific, use of the phrase *silent spring* in newspaper articles that dealt with FMD, GM food and the loss of song birds can be illustrated by the following quotes:

(1) "Silent Spring indeed." (*The Times*, 19/03/98)

(2) "It is the year 2020 and the most silent of silent springs" (*The Times*, 13/07/98).

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[9] Any of the groups to which animals are assigned according to the principles of taxonomy, including species, genus, family, order, class and phylum.

[10] See Greenwood (1995).

(3) "Now there is a threat of another silent spring." (*The Times*, 13/08/98)

(4) "The silent spring scenario" (*New Scientist*, 31/10/98).

(5) "[…] another silent spring" (*Observer*, 09/01/00).

(6) "The phrase silent *spring* needled my brain." (*Daily Telegraph*, 29/04/00)

(7) "'It's the silent spring here'". (*Guardian*, 26/02/01)

(8) "Is this the start of a silent spring?" (*Guardian*, 07/03/01)

(9) "Out of this silent spring grows a special fear" (*Guardian*, 07/03/01)

(10) "Silent spring: Farming needs steady hands now and brave thinking later." (*The Times*, 14/03/01)

(11) "A silent spring indeed" (*Guardian*, 20/03/01)

(12) "He wonders what he will do with empty fields in a silent spring" (*Guardian*, 24/03/01)

(13) "In Britain this spring, a silence is descending on agriculture itself" (*Guardian*, 11/04/01)

(14) "Normally, by now, the fields would be alive with gambolling and baa-ing lambs. There is nothing: it is Silent Spring." (*Guardian* 14/04/01)

(15) "Meanwhile, spring has become a little more silent." (*Guardian*, 18/05/02)

(16) "… it's a tragedy of Silent Spring proportions." (*Guardian*, 17/07/02)

The 'silent spring scenario' exploited in these extracts had first been set out in a story with which Carson prefaced her scientific account of the impact of pesticides on wildlife and humans. She had called this *fictional* story 'a fable for tomorrow' (Carson 1962/2000:21-22). Here is a passage from this story. When analysing the media stories using the *silent spring* metaphor, we shall see how journalists (just as Sir John Krebs in the article quoted above) knowingly or unknowingly took their cue and their images from this story when writing about the loss of songbirds, the impact of GM crops or the handling of the FMD in Britain.

> There was once a town in the heart of America where all life seemed *to live in harmony with its surroundings*. The town lay in the midst of a checkerboard of prosperous farms, with fields of grain and hillsides of orchards where, in *spring*, white clouds of bloom drifted above the green fields. […]
>
> Along the roads, laurel, viburnum and alder, great ferns and wildflowers delighted the traveler's eye through much of the year. Even in winter the roadsides were places of beauty, where *countless birds* came to *feed on the berries and on the seed heads of the dried weeds rising above the snow*. The countryside was, in fact, famous for the abundance and *variety of its bird life*, and when the flood of migrants was pouring through in spring and fall people traveled from great distances to observe them. […].
>
> Then a *strange blight* crept over the area and everything began to change. Some *evil spell* had settled on the community: *mysterious maladies* swept the flocks of chickens; *the cattle and sheep sickened and died*. Everywhere was a *shadow of*

> *death*. The farmers spoke of much illness among their families. In the town the doctors had become more and more puzzled by new kinds of *sickness* appearing among their patients. […]
>
> There was a strange stillness. *The birds, for example - where had they gone*? [see article by Krebs, et al, 1999, quoted above] Many people spoke of them, puzzled and disturbed. […] The few birds seen anywhere were moribund; they trembled violently and could not fly. *It was a spring without voices*. On the mornings that had once throbbed with the *dawn chorus* of robins, catbirds, doves, jays, wrens, and scores of other bird voices *there was now no sound*; only *silence lay over the fields and woods and marsh*. (Carson 1962/2000:21-22, italics added)

The majority of newspaper articles published between 1998 and 2002 in the broadsheets are short and matter of fact, but some deserve a closer look in terms of the rhetoric and images used to convey a specific message. I shall therefore analyse some salient articles in more detail, one on the disappearance of songbirds, the theme that is most intimately connected with the phrase *silent spring*, one on GM crops and two on FMD.

2.3 Birds, crops and cattle – a silence of many voices

Songbirds

One article, with the title "The silent spring", published in *The Observer* by Nicci Gerrard[11] on Sunday, March 21, 1999, displays a particularly dense firework of metaphors and images, exploiting in particular the auditory associations suggested by the counterfactual metaphor *silent spring*: the absence of animal voices (see example 14). *Silent spring* is used as a popular reference here, as Carson's book is not mentioned. However, when reading the article, many readers, who know the book and the 'fable for tomorrow', would recognise direct intertextual echoes. The article begins with a description of a normal spring. This is evoked by phrases such as:

(17) "sounds of birds singing"
(18) "sweet, high sounds"
(19) "web of sound, up and down the scales"
(20) "world of sound"
(21) "singing their hearts out"
(22) "din"
(23) "hoarse-voiced rooks clattering from their nests"

[11] Since 1995, Gerrard is a senior feature writer and contributing editor at the *Observer*. She has also published a number of novels (see: http://www.figuresdestyle.com/french/us_web/gerrard1.htm; accessed October 2002).

(24) "reassuring call of the wood pigeons"
(25) "the great chorus resolves into the less rapturous songs of daytime"
(26) "liquid sound"
(27) "the dawn chorus"
(28) "'There's a greenfinch singing. Do you hear, do you hear?'"

This world or web of sound and imagery which captures the stereotypical aspects of spring in the British countryside, contrasts with the *silent* spring evoked by phrases, such as:

(29) "all that's missing is the soundtrack"
(30) "in search of a dawn chorus"
(31) "the dawn chorus is becoming muted in Britain; and it is changing its chorus line"
(32) "their voices have faded from the countryside"
(33) "it is empty and silent."

As Gerrard says, "It is more difficult to see and hear an absence", but the metaphor of *silent spring* and the network of associated sounds and images actually allows the readers or listeners to do just that: they can see, hear, feel an absence. This is quite an emotional experience, one of loss, sadness, despair, and regret, an experience that can spur readers into action - to do something, to restore the web of sound that has been torn and to banish the silence that lies over the countryside. Gerrard portrays this silence as a symptom of changes in agriculture and food production, in particular intensive farming, subsidies, the use of pesticides and the introduction of GM crops. These are seen as agents responsible for 'the killing of the countryside', as one writer, Graham Harvey, has put it in a book published at the same time (Harvey 1998). Gerrard too uses metaphors of death to portray the effects of this metaphorical and literal killing. She talks about 'a living shroud', and 'a landscape of the dead'.

The theme of the killing of the countryside was pursued by other writers, who used *silent spring* to discuss the possible influence of GM crops on the countryside and the more direct experience of killing millions of animals during the FMD outbreak. During the FMD crisis silence became in fact a major trope for those expressing their feelings in poems and pictures.

Genetically modified crops

In his article on GM food and crops entitled "Silent spring" (*The Times*, July 13, 1998) Nick Nuttall, the *Times'* environment correspondent, also exploits the auditory aspect of the metaphor *silent spring* and the associations surrounding the 'silent spring scenario' when he

begins his article in the style of a sci-fi story, echoing Carson' 'fable for tomorrow'. Both Gerrard and Nuttall continue this fable and warn us that fiction can easily turn into fact.

> It is the year 2020 and the most silent of silent springs, apart from the rustle of genetically engineered oil-seed rape, wheat, maize and other "designer" crops nodding in the breeze. Songbirds such as the lark, linnet and mistle thrush, long in decline, have finally fled the English countryside because the seed-producing weeds on which they depend have been eradicated from fields and hedgerows by relentless chemical spraying made possible by biotechnology. ["where countless birds came to feed on the berries and on the seed heads of the dried weeds rising above the snow", Carson, 1962/2000:21]
>
> Meanwhile the hum of bees and other insects has also been silenced, thanks to the planting of genetically altered crops that produce insect-resistant toxins. They annihilate not only aphids and other pests but also beneficial insects on which birds and bats depend. Native wildflowers are in retreat but "superweeds", resistant to chemical treatment, have emerged. This is the nightmare scenario surrounding genetically modified plants, echoing that of Rachel Carson's classic book about the pesticide DDT, Silent Spring.

GM crops and foods are, like the clones that appeared on the European horizon at the same time, artificial human creations, and have been referred to as Frankenfood etc. Unlike in the cloning discourse, references to other sci-fi sources (such as *The Day of the Triffids* or *The Attack of the Killer Tomatoes*) are however rare. The metaphor most often used in GM discourse is that of *silent spring*. A reason for this might be that it is much more difficult to use stock characters and images in the debate about GM. Writers therefore also resort to stylistic devices other than metaphor, such as alliteration, literary flourishes and word play, such as 'seeds of disaster', 'seeds of doubt', 'bitter harvest', 'cultivating concerns', and so on (see Nerlich et al. 2000), which all tie in, in one way or another, with the imagery evoked by *silent spring*.

Foot and mouth disease

As hinted at in the epigraph used at the beginning of this article, the start of 2001 was a turbulent time in the UK: "This year, like the enactment of some apocalyptic, millennial fantasy, we have already had storms, foods and blizzards. Agriculture is still linked to BSE, e-coli, salmonella, bovine tuberculosis and swine fever. Now there's a visitation from a virus, reappearing from a painful, long-ago memory, and burning through the ecology of commerce like wildfire." This is how Paul Evans, the *Guardian*'s countryside diarist, described the situation on March 7, 2001 in his article entitled "The silent spring". The last major outbreak of FMD in Britain had occurred in 1967. At that time over 250,000 million animals were

killed, mainly in one part of the country. This time about 6 million, mostly uninfected, animals, were killed all over the UK. It should be stressed that FMD is not harmful to humans, neither is it lethal to animals.

The strength of the virus lies in its ability to spread 'like wildfire' (through the population of farm animals and, on a metaphorically even more abstract level, the wider 'ecology of commerce' linked to farming, such as tourism), to 'flare up' everywhere and to undermine the economic competitiveness of a country that wants to maintain disease-free status. The reasons for eradicating FMD are therefore mainly economic. The policy of choice used since the beginning of the 20th century is that of slaughtering all infected animals (see Woods, 2002), a policy that was extended in 2001 to include millions of uninfected animals – effectively creating 'firebreaks' to halt the spread of the 'wildfire' that was the epidemic. This was seen as the only way to 'win the battle' against the disease, to bring the disease under control and thus to control Nature and the ecology of commerce. (For a more detailed analysis of the metaphors used during the outbreak, including the fire metaphor and the war metaphor, see Nerlich et al. 2002b).

The war metaphors used during the FMD epidemic were quite similar to those used in the 1960s in the 'war against insects' as described by Carson. In both cases, FMD and insects, scientists and policy makers assumed they could control nature, either by the use of pesticides or by the less sophisticated approach of killing millions of animals. In the 1960s they did not foresee the wider effects that pesticides could have on the environment, on wildlife and on humans. In 2001 they did not foresee the environmental, as well as the wider social and psychological impact of the slaughter policy (see Mort et al., in prep.). *Silent spring* captured the negative emotions that underpinned popular resistance to pesticides and might yet sway popular opinion against slaughter and in favour of vaccination when FMD comes round next time. In both cases, silence followed after the noise of the battle against pests or a virus had subsided.

In most of the articles studied here *silent spring* evoked death, emptiness and the general despair felt by many involved in the slaughter or affected by the slaughter, a despair vividly expressed in many poems written by adults and children during the FMD crisis, poems which are permeated by the topic of 'silence'. Here is one of countless examples, again playing with the contrast of a noisy and a silent spring:

> Silence….
> Lots of silence
> No moo, no baa, no neigh.
> No more sheep to round up no more.
> Silence…
> (Matthew Whitehouse, Age 11 from Settle Middle School) (published in: *Life Extinguished*, 2001:17 and 60)

In a second article on FMD, "Scrubs up a treat"[12] (*The Guardian*, April 11), Paul Evans turned the metaphor of *silent spring* as denoting death and despair on its head and turned it into a symbol of hope. FMD metaphorically and literally silenced cows, sheep and pigs, but it gave back a voice to wildlife, normally under threat from industrial farming and from overgrazing by sheep, which tends to destroy shrubs, scrub and trees and can lead to the loss of vegetation, soil and other animals' habitats.

Evans points out: "When Rachel Carson published Silent Spring in 1962, she conjured up an image of spring bereft of birds caused by insidious, unchecked pollution and the profligate use of pesticides by agriculture." As many journalists before him, Evans stressed that "[s]uch a simple yet terrifying idea inspired a generation and contributed to the rise of the modern environmental movement."

However, the silence experienced in the spring of 2001 was a new type of silence: "In Britain this spring, a silence is descending on agriculture itself. For a countryside which owes its character to farming, this silence is also terrifying." This was not a silence brought about by the use of pesticides, where the farm animals and crops survive but the 'pests' die, but a silence following the killing of these animals themselves.

After the slaughter a debate began about intensive agriculture, the role of supermarkets, the availability of cheap food for all (see Nerlich, in press) and the alternatives, such as local food distribution, farmers markets, organic food and sustainable agriculture – a debate that is currently continuing at EU level, where some dare to think about reforming the Common Agricultural Policy, and where some dream of replacing a productivist agriculture by a post-productivist agriculture. Evans evokes these dreams and debates as follows:

> Out of the silence will emerge a debate about what shape the future countryside will take. It will be motivated by competing interests and cultural, political and economic agendas. Despite the feelings of despair surrounding the present countryside crisis, there are many options.

[12] This title is a blend exploiting the expression ‚scrubbing up a treat', referring to a person who normally dresses blandly and unexpectedly appears in nice clothes, and the word *scrub* meaning ‚undergrowth'.

> However, new forms of agriculture may emerge which are subsidised to produce environmental benefit rather than food production. By design or default, large areas of Britain may be left to the processes of wild nature.
>
> *It could be argued that the present countryside crisis is the opposite of Silent Spring: as agriculture suffers, wildlife flourishes*. […]
>
> There are environmentalists who would dearly love to see an end to farming in upland areas of Britain and a return to wilderness exclusive of any human intervention. […] There are many who want to preserve the cultural landscape character of places like the Lake District, with its wide-open spaces maintained by sheep grazing, and find the prospect of new woodland an anathema.
>
> *The story of Silent Spring not only helped to start the environmental movement, it also coincided with the intensification of agriculture. We may have come full circle in that environmental concerns will reshape agriculture and in so doing, reshape the countryside.* But promoting the value and potential of scrub will require courage. (Italics added)

It should be stressed however that while a simple contrast of powerful images makes a good story, most conservationists would acknowledge that the reality of habitat restoration and maintenance is much more complex than 'removing agriculture to let wildlife flourish' – living in harmony with nature is a very difficult balancing act.

3. Conclusion

In this last part of my article I want to answer two questions: (1) What conclusions can we draw from this investigation for the theory of metaphor?; and (2) What can this investigation tell us about the influence of *silent spring* on recent environmental and agricultural debates?

3.1 *Silent spring* and the theory of metaphor?[13]

Metaphors, such as *silent spring*, are not static entities, but dynamic phenomena that adapt to the discursive needs of those who use them and to the socio-political circumstances in which they are used. They have what one could call an internal and an external productivity, which, through their interaction and feedback, mutually enhance each other. This means metaphors like *silent spring* develop new meanings over time and their study can shed new light on how to understand the dynamic and social aspects of metaphor, polysemy and semantic change.

[13] Without Roslyn Frank's prodding this section would never have been written. There is obviously much more to say here, but this will have to wait for another occasion.

Metaphors like *silent spring* seem to have a semantic dynamics that is based on the one hand on their intrinsic or textual semantic potential and on the other on their extrinsic or contextual use in various social, political, cultural and economic circumstances over time. This dynamic adaptability and polyphonic potential is also grounded in the metaphor's appeal to various audiences at one and the same time (see Kroll 2001) and over time. In the case of *silent spring* this double dynamics is further enhanced by the fact that the metaphor, unlike for example the metaphor *desktop* in computer jargon, is linked to a specific text, is a title that evokes a whole book. Over time the title becomes gradually dissociated from the book and takes on its own semantic dynamics, but echoes of the book's content survive with the title and are themselves adapted to changing circumstances. This is important if a metaphor is to survive in and reverberate with popular imagination. In his book *Frankenstein's Footsteps* Jon Turney (1998) has suggested that just the title of a cultural reference, such as *Frankenstein*, can evoke an entire story or 'script', which can be used again and again as an interpretative frame. This frame then structures the narratives through which the public communicate concerns – in this case about cloning, in the case of *silent spring* about the environment.

To create a somewhat circular metaphor in the context of this special issue, one could say that by observing the various uses and manifestations of *silent spring* in a range of discourses over time, I want to contribute to a new field of metaphor studies: the 'evolutionary ecology of metaphor'. Evolutionary ecology studies how organisms evolve and adapt in interaction with their environments, or more radically, how organisms co-evolve with the environments. The evolutionary ecology of metaphor would similarly study how metaphors adapt, change and co-evolve in contextual use.

Let us now summarise how *silent spring* has evolved and become adapted to its various environments, including its interaction with other metaphors and other textual, cultural and socio-political events.

- Its intrinsic metaphorical potential derives from the counterfactual blending or conceptual integration of the two words *silent* and *spring* and the network of connotations that they evoke, at least in some parts of western culture (see figure 2).[14]

- This intrinsic textual and conceptual potential is enhanced by the fact that the metaphor is the title of a book and resonates with various aspects of the book, such as the

[14] On blending and its dynamic features, see e.g. Fauconnier and Turner (2002).

'fable for tomorrow', the chapter title 'And no birds sing', and so on. Both the fable and the chapter title, for example, had an enduring appeal for readers over the last four decades, readers that might never have read the whole book, but who continue the textual tradition of the book and the metaphorical life of its title by linking the title to the fable and the chapter heading (and the chapter heading to a poem by Keats quoted at the beginning of *Silent Spring* and through it to the whole romantic tradition) and using them for ever new purposes. This link between blend and book gives *silent spring* a metaphorical depth and power of survival that other metaphors, such as say, *genetic time bomb*, may lack.

- The inter-textual potential of *silent spring* emerges from the way the blend resonates with other scientific and fictional narratives, which filled the literary and cultural space around it throughout the last four decades.

- The co-textual potential of *silent spring* derives from the way this blend resonates with other metaphors over time, such as *nuclear winter* and *population bomb* in the 1960s, *terminator tree* or *Frankenfood* in the 1990s (which, by the way, employ alliteration to enhance their metaphorical flavour, just like *silent spring*), and *killing fields* or *the killing of the countryside* in 2001 (for an analysis of *Frankenfood* from the point of blending theory, see Hamilton, in press).

- And finally, the con-textual potential of *silent spring* derives from the way the blend draws 'inspiration' not only from co-textual or inter-textual mental spaces but from backgrounded mental spaces which reflect the socio-political circumstances of those who continue to use the blend, such as the fear of the atom bomb in the 1960s, the fear of genetic modification in the 1990s and the fear of the death of British agriculture in 2001. The changing nature of these socio-political circumstances adds a temporal embedding to the blend, that is to say, a diachronic evolutionary direction: each time it is repeated, its socio-temporal embedding leaves a mark. There is continuity too, however, as the effects of pesticides on the environment, on wild life and on humans persist to be a general concern and with it the fear of a *silent spring*.

The various 'readings' given to the original blend over time, which are constrained but also enhanced by certain socio-political and cultural circumstances, can themselves become metaphorically and socially productive in turn and become gradually more dissociated from the book, but without ever loosing their evolutionary links to the text completely. I have tried

to highlight this by analysing *silent spring* as a popular reference, a cultural given, rather than a fresh metaphor.

This ecological and dynamic view of metaphor can be further elaborated by linking it to James Gibson's theory of 'affordances'. He defined affordances as follows:

> The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill. The verb to afford is found in the dictionary, but the noun affordance is not. I have made it up. I mean by it something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment […]. (Gibson 1979:127)

Gibson had been dissatisfied with the way psychologists studied perception in artificial laboratory settings as an internal cognitive event and he had wanted to replace this approach with a more ecological one. Similarly, I have been dissatisfied with the ways some cognitive linguists study metaphor in relatively artificial laboratory settings and conceptualise it as an internal cognitive event and I would like to replace this by a more ecological approach. I want to study the affordances that a certain metaphor has, what it can be actively used *for* and what it has been effectively used for, and how this changes the metaphor and the way it is used over time. I want to study the interaction and complementarity between a metaphor and its environments of use.

In terms of Maturana and Varela (1980) an ecological theory of metaphor would study the 'structural coupling' between a metaphor and the environment, how it is constantly interacting with its (discursive) environment and, in the process shaping the (discursive) environment itself, as well as, more broadly, the sociocultural/economic circumstances of the time(s). The counterfactual blend *silent spring* creates ways of 'seeing', of comprehending our surroundings. Over and above its intrinsic semantics it therefore has a 'pragmatic', dynamic, action-oriented face which allows it to interact with these (everchanging) sociocultural/economic conditions (its environment). In the process, through these 'structural couplings' it changes its own shape (its meanings and connotations) and at the same time impacts its 'environment'. It manifests what some biosemioticians and cybersemioticians call a niche-like quality (Hoffmeyer 1997), as it has the ability to aid in the mobilisation of human beings behind environmental causes.

3.2 *Silent spring* and the debate about the environment

There is no simple choice between nature and culture,[15] the natural and the unnatural or artificial, between civilisation and wilderness, between the silent spring that silences the voices of wild animals and the silent spring that silences the voices of domesticated animals. As Carson tried to make clear throughout her career, we have to find a way to live in harmony with nature, in balance with nature (see Lear 1997). But in the search for this balanced way of living on earth we cannot abandon science and just go back to nature, we need science to restore a balance that has been destroyed gradually since humans began to cultivate the land, but a science that dares to confront big business, where dreams of conquering, subjugating, controlling and exploiting nature are still being dreamt every day.

Testifying to a committee in 1963, "Carson took the opportunity to remind the world of the wider implications of her work: 'We still talk in terms of conquest. We still haven't become mature enough to think of ourselves as only a tiny part of a vast and incredible universe. Man's attitude toward nature is today critically important simply because we have now acquired a fateful power to alter and destroy nature. But man is part of nature and his war against nature is inevitably a *war* against himself.'" (Burnside 2002) Since 1962 this power has increased manifold, especially through developments in human and agricultural genetics. Hence, even more care has to be taken not to run away with the advances of science.

We have seen in the UK that when it comes to fighting ancient livestock diseases, such as FMD, a primitive all-out war or slaughter – what Carson called "as crude a weapon as a cave man's club" (Carson 1962/2000:256) – still seems to be politically and economically much more desirable than a more modern or 'scientific' approach, such as vaccination. When it comes to dealing with nature, war and conquest, whether on political, economic or scientific grounds, still seem to be the preferred options and the preferred ways of framing policies metaphorically, be it on a national or on a global level. One of the biggest challenges facing modern science, modern society and modern states is perhaps "how states can govern nature in the increasingly globalised risk society" (Macnaghten and Urry 1998:254).

[15] A rather arbitrary dichotomy that has dogged western thinking for a long time – but this is yet another story (see Descola and Pálsson 1996).

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