

# sophia

Issue 4

December 2009



The death of editing?  
'Difficult' languages  
Sustainable cities  
The future of ethics

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Cover image: As much as 71% of our planet's surface is covered with water and climate change is causing this to increase rapidly. We can expect to face the impact of this change in the next 50–100 years. We are exploring the possibility of living in a landless environment. Instead of capitulation and retreating away from the attacking waterfront, why not use the water's surface for everyday living.

VITAMIN (Vytautas Jackevicius and Mindaugas Skrupskelis) MArch Urban Design, Bartlett School of Architecture. See p.18–19 for more

THE GLOBAL ECONOMIC CRISIS and the assorted expenses scandals of the past year have gradually engendered a rather penny-pinching culture, with the spotlight frequently fixed on the public sector. This is fantastic food for thought for James Shafe (p. 15) but has been less than good news for *Sophia* as belt-tightening has meant that this issue will have, at best, a very limited print run. We are actively seeking advertisers and sponsors to fund printing of Issue 5 and would be very grateful for any suggestions.

This issue showcases the culmination of our first collaboration with UCL's Grand Challenges scheme: a writing competition on the theme of 'Sustainable Cities'. The competition was in memory of Craig Patterson who founded Grand Challenges and was passionate about student engagement with the initiative. The winner of the competition was Olivia Hamlyn, studying for an LLM in Environmental Law; her entry, an account of a fictional city – Athanasia – which exists in balance with its surroundings, is reproduced on page 33.

Our cover and centre pages feature stunningly modelled images from an altogether different imagining of a sustainable urban future on the surface of the Earth's oceans.

Editing an article about the 'death' of the editor could have been a rather strange and unsettling experience. Although, in a personal sense, I'm going to be hanging up my editor's cap in the next couple of months, Susan Greenberg asks what future there is in the act of editing in general (p. 8). While it is certainly true that the type of mass-collaborative editing made popular by Wikipedia has achieved much, and the scope for automated content generation in the putative semantic web is great, I have to say I was relieved that Greenberg still sees a place for human judgement and interpretation.

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*"Many commentators have seemed almost surprised that politicians act improperly under cover of secrecy. For Bentham, this would have been no surprise"*

James Shafe  
p. 15

*Sophia* is a volunteer-run magazine aiming to showcase talent in research, writing and art from current UCL staff and graduate students.

By publishing academic content written for a general readership, *Sophia* hopes to encourage the sharing of ideas and an appreciation of the advances being made in areas of research other than our own; and to act as a forum for the discussion of academic issues and current affairs.

In creating *Sophia* we hope to provide opportunities for graduate students to begin writing about their work and for established researchers to write more creatively and for a broader audience than in a specialist journal. We believe that providing this platform will help contributors to develop as writers as well as giving readers an insight into the diverse spectrum of research taking place at the university.

If you are interested in submitting content then please contact the editor or relevant section editor. Submission guidelines are listed on our website:

[www.sophiamagazine.co.uk](http://www.sophiamagazine.co.uk)

### VISUALISATION IN THE EDUCATION OF A CHEMIST

Professor Peter Atkins is a name instantly recognisable to chemistry students from their recommended undergraduate physical and inorganic chemistry textbooks. Unsurprisingly, therefore, the recent UCL Chemical and Physical Society talk given by Atkins was delivered to a packed-out lecture theatre, with some unlucky students even squeezed in behind the back row of seats. The thought-provoking topic that Atkins chose to present, to an audience ranging from first year undergraduates to retired academics, was 'Visualisation in the Education of a Chemist'. He explained to us how, throughout his career as a physical chemist and author of both chemistry textbooks and popular science books, he has attempted to use images to help people to understand abstract ideas.

Atkins strives to translate complicated concepts, equations and theories into more easily understandable diagrams and pictures. His textbooks are filled with carefully thought out images to accompany and reinforce the text. He believes that pictures are essential in textbooks to reduce the often complicated text to a more palatable form of communication, especially for those students who do not have English as their first language.

In the talk Atkins presented a few of the more demanding physical chemistry topics that he has successfully represented in

pictorial form. These include such difficult concepts as the origin of the electromagnetic force, the Schrödinger equation, complex wavefunctions and density matrices. Atkins lightened the tone somewhat with some amusing cartoons of famous scientists, then returned to more challenging ideas, such as the notion that tetrahedral holes in close-packed crystal structures are octahedral in shape. There are, however, some physical chemistry ideas, such as valence bond orbitals and phase equilibria, that even Atkins has found difficult or impossible to successfully represent in a visual way.

At the end of the talk we were reminded of the importance of developing our own personal visualisations of abstract ideas, since through this process one can gain a far deeper understanding of a topic than by simply using someone else's. Atkins made a comparison to the difference between watching a film and reading a novel: while watching a film we are presented with someone else's interpretation of the characters and setting, but when reading a book we are forced to actively visualise the characters ourselves, often leading to a greater engagement with the material.

Laura Fenner

### DISPOSAL?

Museums and collections are usually associated with the idea of gathering and caring for objects of interest. But what happens when it all becomes too much

and a selection *needs* to be made? This was the difficult and even controversial question addressed by the exhibition in UCL's Chadwick Building from 19–31 October. While wandering across the two rooms of the exhibition where a range of objects from the UCL Museums and Collections retrieved from different sites were displayed, visitors were invited to think about whether these exhibits were really worth keeping. The posters hanging between the objects – which included portraits, animal skulls, life and death masks and even a radioactive mineral – encouraged the visitors to consider the wealth of criteria such as size, condition, safety and uniqueness that could be used to answer the question posed by the title of the exhibition: *Disposal?*

The exhibition has certainly been an attempt to engage in a dialogue with the general public. The messages left on the board where visitors were free to express their views on issues related to the event were a clear sign that *Disposal?* has indeed been a thought-provoking experience for many. Some people reacted to the question *Disposal?* with even more questions, proposing other criteria according to which the selection of exhibits should be made; others stressed that unwanted objects should be given to individuals, communities and institutions that would appreciate, look after and make use of them. There is no doubt that the strongest reactions were provoked by a set of plastic dinosaurs and cowboy boots.

The exhibition also ran an interesting public vote. All the visitors entering the room were handed two stickers. After considering the first five objects – the so-called Agatha Christie's picnic basket, Channel Tunnel soil samples, surgical equipment, planetary images and a hippopotamus skull – you could use the red sticker to vote out the object that you would have got rid of. Having completed a tour of the whole exhibition, you could then vote with the orange sticker either confirming or changing your initial choice. As the rest of the exhibition, this exercise was a way to get people to reflect on all the practical and ethical issues involved when deciding whether to discard one of these objects or not. The disposal process is clearly complex and this is why, for now, no object will be disposed of, at least just yet.

*Elettra Carbone*

JORGE CHAM: 'THE POWER OF PROCRASTINATION'

Hey, what are you doing here? Don't you have some research you should be getting on with? That was the tongue-in-cheek message of Jorge Cham's hilarious illustrated talk on life as a PhD student.

Cham is a cartoonist who began drawing a regular strip of the trials and tribulations of a bunch of fictional PhD students while a PhD student himself at Stanford University. Entitled 'Piled High and Deeper' (PhD), the strip wryly recreates those situations all too familiar to PhD students. The nerve-racking meetings with supervisors who pull apart your work and send you back to the drawing board; the sinking feeling that no matter

how much work you do your research is going nowhere, but most of all, the power of procrastination. That overwhelming urge to check your emails, watch TV, go to a cafe, re-arrange your ringbind folder filing system – in fact, to do *anything* apart from the work you should be doing. The fact that UCL's Graduate Skills programme offers courses in overcoming procrastination suggests that it can be a genuinely serious problem for research students. Cham's talk – half stand-up comedy, half mass therapy session – offered no easy answers; the point was to entertain, not to advise. But, indirectly, Cham's cartoons do have a comforting message. You're not the first postgrad student to feel lonely, overwhelmed, insignificant and directionless. In fact, it's par for the course.

Cham was an engineering student, and so has a knack for expressing procrastination in terms of puns based on well-known scientific concepts and formulae. Newton's First Law of Motion becomes Newton's First Law of Graduation: 'A grad student in procrastination tends to stay in procrastination unless an external force is applied to it.'

The effect of the internet on postgrad research is also expressed formulaically:

$$\text{Net effect of the Internet on research productivity} = \frac{\text{Readily available information}}{\text{Ways to procrastinate}} = \text{None}$$

Piled High and Deeper can be viewed online for free at [www.phdcomics.com](http://www.phdcomics.com). The next time PhD life is getting you down, a flick through Cham's comic strips may be just the tonic you need to remind you that you're not alone. Besides which, procrastination has never been so much fun...

*Anna Bailey*

WHAT MAKES A GOOD SCIENTIST?

As a mathematician who has recently ventured into the field of Biology, I have found myself intrigued by the theory of evolution. So when I received an email about Professor Steven Rose's seminar 'Evolutionary theory today – from Dobzhansky's dictum to developmental systems theory', I decided to postpone reading my biological papers, and attend.

Professor Rose opened with Dobzhansky's famous quote: 'Nothing in biology makes sense except in the light of evolution', further adding that nothing in evolution makes sense except in the light of development. He opposed the theory of the 'selfish gene', and the perception of the organism as a passive vehicle in the process of evolution. Instead he asserted that a more holistic approach to understanding evolution is necessary, arguing that selection takes place not only at the level of the gene but also of genomes, cells, organisms and populations.

It so happened that among the audience was another outstanding scientist, Professor Lewis Wolpert, whose strong reductionist views were challenged by Professor Rose's talk. A lively debate commenced between the two, stemming from the vast chasm between their approaches.

I was captivated by the passion of those prominent professors. They were posing similar questions but had developed opposing views with regards to methodology. After the seminar, the thoughts running through my mind were less about selfish genes and natural selection, and more about what it is that makes a good scientist. By 'good', I do not simply mean 'successful'. Is a good scientist one whose discoveries and theories are coherent? Is it a scientist whose work and findings continue (or redirect) the trajectory of science toward the best? Or are passion, devotion and drive sufficient merits to constitute a good scientist? What would help me, a new PhD student, to make the best scientist I can out of myself?

After my long day of lectures, any signs of fatigue were giving way to a sense of purpose and motivation. For the first time, I truly appreciated the significance of keeping myself open to new challenges. The seminar had not just been a great opportunity to hear a fascinating discussion about the theory of evolution. It was an event I had chosen to attend, that had initiated a series of thoughts which, I now realize, are as significant to my research as the biological papers I read later that evening.

*Zena Hadjivasiliou*

OH, COME WITH OLD KHAYYAM

Pursuing a line of research which consists almost entirely of working on a computer makes one doubly grateful for UCL's proximity to a wide range of exhibitions and collections. A bout of square eyes recently took me to an exhibition currently showing at the British Library's Folio Society Gallery charting the 150

Ah, make the most of what we may yet spend,  
Before we too into the Dust descend;  
Dust into Dust, and under Dust, to lie;  
Sans Wine, sans Song, sans Singer, and – sans End!

*The Rubaiyat of Omar Khayyam, verse 26*

years of history since the publication of Edward FitzGerald's collection of translated Persian poetry *The Rubaiyat of Omar Khayyam*.

Although the achievements of Omar Khayyam would make a fascinating exhibition in itself, almost more interesting is the subsequent history of orientalist fashion which saw repeated republications of FitzGerald's translation as well as a scholarly battle over the core of Khayyam's philosophy.

A quiet-living poet and letter-writer, FitzGerald took up the study of Persian in his mid-forties, eventually publishing the first edition of the *Rubaiyat* aged fifty. The work features over a hundred of Khayyam's four-line verses or *quatrain*s (see quotation above) which muse on life, death, action and – recurrently – the drinking of wine.

In addition to his prolific poetic output, Khayyam wrote what is considered to be the foremost treatise on algebra in pre-modern history. He also wrote on music, medicine and astronomy and some have suggested that he predated Copernicus in proposing a heliocentric theory of the solar system.

FitzGerald has been criticised for an overly loose interpretation of Khayyam's original verse and his translation's immediate reception was one of indifference, but, after being discovered by the poet and painter Dante Gabriel Rossetti it became quickly popularised and has been in print ever since, even

finding its way into parodies such as *The Rubaiyat of a Persian Kitten*, *The Rubaiyat of a Huffy Husband* and, perhaps more fittingly given its fatalistic theme, *A Rubaiyat of the Trenches*, penned during the First World War. The increasing turnover rate of fashions in art and illustration, together with a novel craze for the 'gift book' saw perennial use of the *Rubaiyat* as a muse for illustrators in art nouveau, art deco and abstract styles.

As for the philosophy underlying Khayyam's verse and other writings, more modern writers have sought to paint the poet as anything from an atheist and hedonist to a devout proponent of orthodox Islam. Many view him as a Sufi mystic and, in the mid nineties, the Hindu yogi Paramahansa Yogananda even published a spiritual reinterpretation of the *Rubaiyat* in terms of a Hindu mystical belief system.

The very exoticism and foreignness of Khayyam may well have been what drove the popular reception of FitzGerald's translation in his later years and, to this day, news coverage reinforces the sense of a cultural gulf between ideology in the western and Islamic worlds. For me, though, the exhibition suggested that FitzGerald, increasingly agnostic in his later life, identified with Khayyam on a personal level: two independent thinkers separated by continents and centuries.

*Ed Long*

# When the Editor Disappears, Does Editing Disappear?

These days, the ‘death of the editor’ is announced with alarming regularity. Professional publishers no longer invest in editing as much as before, and the internet has made self-publishing commonplace and acceptable. The question remains, however: does editing disappear along with the editor? [Susan Greenberg](#) replies...

**T**HE SHORT ANSWER IS, NO. If we use a simple, generic definition, we find that there are still many ‘acts of editing’ taking place. But responsibility for the work has shifted from the professional intermediary down to the author and reader, and from human to other, more automated types of intervention.

Editing as a distinct activity tends to be pushed to the margins. This is partly because it takes place behind the scenes, and partly because it is everywhere and therefore nowhere. Where it does draw attention, the focus is usually on very specific people, periods, or aspects of the work, rather than a generic analysis. The field of bibliography provides some space for cross-cutting analysis but the focus is on textual editing for scholarly editions, mostly of long-dead authors, rather than on editing as a live, contemporary process.

## WHAT IS EDITING?

I make a distinction between the *activity* of editing and the *person* doing it, the editor. Over time, and in each new mode of production, editing has many different names, so a focus on the activity rather than the person gives us a more reliable basis for analysis. I describe editing as a *decision-making process*, usually within the framework of a professional practice, which aims to select, shape and link content. The point of the exercise is to help deliver the meaning of the work to its audience.

This happens in a triangular relationship between the editor, the author and the content itself. The author’s intentions matter to the editor but the priority is to the text, to make it as good as it can be. To do this, the editor is asking the same questions as the author about the process of creation, but with the distance of a

third party. The editorial content should be understood as something in a state of ‘becoming’ rather than a final, finished product. This applies as much to text in print as on the internet: computer software makes the mutability of text obvious to a wide audience, but professional editors have been aware of this all along.

At the end of the ‘making’ process, lies reception of the content by the reader/ end-user. The audience is not usually present in the making process, but is represented in a bodily way, through the person doing the editing. The editor has the explicit responsibility of representing the audience, and giving the text attention on its behalf. The metaphor of the editor as the reader’s representative is a consistent and persistent one. In a classic collection of essays on the practice of book editing, for example, the editor is characterised as ‘acting as the first truly disinterested reader’, while a film editor, writes: ‘The central preoccupation of a film editor [...] should be to put himself/herself in place of the audience’, and a bibliographical scholar refers to editors as ‘those who must mediate between text and reader’.

Editing, like good quality writing, is a way of regulating the user’s attention by creating a sense-making pattern. Cognitive psychology highlights the human need for patterns as a way of making sense of the world – people need to find a pattern in what they see and then match it to what they know; they do not enjoy the experience of being ‘lost’. Narratology and related disciplines concern themselves with the pattern-seeking impulses of storytelling, while developmental psychology and psychotherapy highlight the key role of the carer in helping the child make sense of experience, by putting things into expressible language.

## EDITING ON THE INTERNET

When computer tools emerged that allowed social networking and mass content creation – a phenomenon commonly referred to as ‘Web 2.0’ – this was praised as a revolutionary new stage in the development of the internet, and a discourse developed about relative merits of amateur vs professional content creation. Now, the debate has an added dimension in which *all* human mediation is potentially eclipsed by the automated interventions of the ‘semantic web’.

At the more automated end, acts of editing occur in the selection work of search engines and RSS feeds (data formats used to publish updated content on a website), which use ‘bots’, a type of software application, to trawl data and metadata. The same can be said of collaborative filtering, which offers people hyperlink choices based on the automatically logged preferences of other users. In many cases one finds a blend of human and automated choices: for example, in the social news website Digg, users rank content with a vote. The ‘shape’ and ‘context’ aspects of editing are present in structured interfaces such as content management systems, based on the computer language XML. This enables the separation of form and content so that the same information, written only once, can be used in different formats and can be easier to search and link. The different ‘objects’ are combined but remain independent. The template rules created for each ‘view’ are set by human decision-makers, but applied to content in an automated manner. On the whole, automated forms of editing make it easier for non-professionals to publish and edit their own work, for example on blogs and social networking sites. But typically, the new exists in a blend with the old. The BBC website, for example, includes both professional journalistic content and large elements of user-generated content, which has gone through varying levels of mediation to ensure useability.

Another type of human intervention is collective or ‘network’ editing, which depends on contributions by a mass of volunteers. The best-known example is Wikipedia, one of the world’s most used websites. Although its content is categorized as amateur, Wikipedia heavily encourages users to follow its guidelines on best practice, which have much in common with ‘professional’ editing conventions. Wikipedia also engages in acts of editing by removing stories found to be inaccurate, and locking controversial articles to prevent long-running ‘edit wars’. A related form of network editing is the kind that takes place after the

event: the feedback provided by readers, reaching an audience via the mediation of a Reader’s Editor, or directly via online discussion boards. Some writers build this feedback into the conceptual framework of the original work, as an ‘infinite cascade’ or by using it to create a new ‘edition’ of the work.

The internet is sometimes presented as a more democratic channel which bypasses the ‘gatekeeping’ of professional editing. But the unmoored nature of online content potentially increases the need for editing, rather than the opposite. Since an online text can be ‘found’ by the reader in many different ways, its meaning can be lost unless the different possible contexts are anticipated. Despite the novelty of the internet as a channel for communication, many websites still use the tried and tested conventions of professional print publishing, translated into a new media context by the language of ‘useability’. Hence content is moved manually through specified stages, modified by people with specific roles and responsibilities, acting according to agreed standards and rules, including attribution, source labelling, date-stamping, and a clear demarcation between editorial and advertising. This is particularly true of websites published by organisations with a reputation to protect, whose brand acts as an ‘editor of choice’.

## THE SHIFT OF EDITING RISK

A mixture of economic and technological changes has resulted in a widespread outsourcing of labour, and alongside it a transfer of risk, from the producer or service provider to the consumer. In book publishing, this has meant a shift in responsibility for editing from in-house editors to freelance editors or agents, and ultimately, further down the chain, to the author. Very little in-house textual editing now takes place. The shift has prompted a wide-ranging debate about why this has happened, and its likely consequences. The debate is influenced by the fact that skilled human intervention is expensive, and the invisibility of editing makes its ‘added value’ hard to quantify. Readers and authors can and do complain about the consequences of poor editing, but publishers measure themselves chiefly against their peers, and protests are unlikely to translate into action if the standards of all are sinking at the same rate.

With digital text, the shift of responsibility from publisher to author has continued moving down the chain, towards the reader him/herself. Originally, when reception theory made the case for the ‘active reader’, the reception was of a finished text and the ‘remaking’

took place in the mind only. With digital text, the reader can re-make the material in a literal sense as well. Even the most conventional online text is different from print in that it is searchable, copy-able, and linkable. To this extent, any text available online is 'unfinished'. Proponents of the semantic web, in which machines talk to machines, argue that we are now also witnessing an even higher level of automated media creation. However, the longstanding claims made for this are much disputed. In one small example, automated summarisation tools that use text-mining have yielded poor results and the focus is now on 'computer-aided summarisation' which helps (but does not replace) human summary-writing.

The internet's own trailblazers have generally recognised that even if the entire world's information could be 'captured' and annotated in the right way, there are some things computers cannot do. Sir Tim Berners-Lee, known as the inventor of the World Wide Web, has said in interviews that semantic tools help people find new ways of interrogating data, identifying patterns and re-using information, but data alone does not amount to human communication: 'If you write a blog, you write a poem, it is one brain to another: machines will try to understand it but they will really not be able to catch up with the poetry.' This limitation has been experienced by humanities scholars involved in digitisation projects such as the Text Encoding Initiative (TEI). One of them, the influential literary scholar Jerome McGann, has written widely about how the practical experience of editing the Rossetti online archive has changed his thinking about digital semantics. 'It was dismaying to discover how much of Rossetti's poetry – how much of his strictly textual work – escaped our powers to represent it critically,' he says in his book *Radiant Textuality*. The problem extended beyond poetry to a whole range of texts, he continues, because encoding privileges a narrow range of linguistic materials, ignoring the links made by the human mind using 'analogues and fuzzy logic'.

#### EDITING: PRESENT AND FUTURE

Editing is an inevitable stage in the creation of meaning – if it did not exist, it would have to be invented – and the question is not whether it happens but who does it, what it is called, and what standard it reaches. People look for skills that will give them professional communication skills, even if they do not end up using them in a professional setting. Workplaces and other

organisations are also putting more resources into editorial training, to enable a wider range of staff to handle 'acts of editing'.

However, the case still needs to be made for recognition of the value of editing, to counteract both cultural and economic pressures on all forms of human mediation. Modern management culture appears to involve a wide-ranging 'coding' of daily life: its critics argue that this has created a box-ticking culture that distorts outcomes and creates a false sense of security. What is missing, in such a culture, is human judgment and interpretation, which are hard to measure and standardise, and therefore suspect. A recognition of editing also goes against the grain of a 'network culture' that may be reluctant to discriminate and criticise, to say that A is better than B.

Ersatz acts of editing are unlikely to reach the highest standards possible on a consistent basis. The absence of experienced third-party intermediaries from the writing process is likely to have an impact over time on the creation of meaning by written text. We need to develop new ways of evaluating the added value of 'invisible' intermediary work, which would benefit not only writing, journalism and publishing, but also many other areas of cultural life and policymaking.

*Susan Greenberg is carrying out research at UCL's Centre for Publishing, is senior lecturer in Creative Writing at Roehampton University, and a founding member of the International Association of Literary Journalism Studies*

#### Further reading

1. R Chartier, *Forms and Meanings: Texts, Performances and Audiences from Codex to Computer*, 1995
2. G Gross ed., *Editors on Editing: What Writers Need to Know About What Editors Do*, 1993
3. RA Lanham, *The Economics of Attention: Style and Substance in the Age of Information*, 2006
4. JJ McGann, *Radiant Textuality: Literature after the World Wide Web*, 2001

A longer version of this article is appearing in *Convergence: The International Journal of Research into New Media Technologies*, Vol 16, No 1, February 2010

## Crónica del Desamor

### *The involvement of the reader and the transmission of female experience*

The Spanish transition to democracy in the late seventies saw a sudden release of literary thought which had previously been suppressed. Mazal Oaknin examines the memories of transition revealed in the characters of a contemporary novel: *Crónica del Desamor*.

**A**FTER MORE THAN THIRTY YEARS of fascist rule in Spain, during the 1970s Franco's health was visibly failing. Contrary to the dictator's master plan and to popular expectation, King Juan Carlos set in motion the changes to democracy after the dictator's death in 1975. The initial enthusiasm however soon led to a sense of disorientation and to a general disillusionment, for the fall of the Franco regime did not automatically bring on the long awaited free and happy world. Indeed, the confusion and uncertainty on how to create a new Spain provoked apathy in a population which was not accustomed to the new liberties just gained. Thus, pessimism, apathy, and disillusionment are constant in most Transition novels, which tend to portray the problematic relationship between the individual and his or her circumstances. In the case of Rosa Montero's *Crónica del desamor* (1979), these circumstances include a series of topics that had been little explored until then. The novel focuses on a group of middle-class, working, and mostly educated women in their thirties whose stories, conversations, and everyday life accounts under the Spanish Transition to democracy are depicted. In fact, the novel's treatment of abortion, divorce, and single motherhood makes the novel an important tool for a feminist analysis of Spanish society. Indeed, their political, cultural, familiar, and personal disillusionments form their particular account of life during that period.

#### CRÓNICA DEL DESAMOR AS AN EXPRESSION OF FEMALE EXPERIENCE

The hard discipline employed by the Franco regime not only tried to control people's lives, it also attempted to manipulate their historical memory and to fix it to the dictatorship period. The situation continued during the Spanish transition to democracy, which is still perceived by many as a pact of oblivion in which peace and democracy were exchanged for silence. Nonetheless, Franco's attempt to suppress dissidence failed in the literary field, for a number of contestant discourses saw the light with the arrival of the Transition. As democracy became reality in Spain, the breaking with the Francoist political institutions went hand in hand with a breaking with the regime's cultural horizon. Given literature's ability to analyse social and historical constructions, as well as to refocus collective subconscious, novels appear to have a great potential as vehicles to recuperate memory and to convey experience. In this sense, Javier Gómez-Montero, a Professor in Spanish Literature in the University of Kiel (Germany), advocates a literary memory of the Transition that facilitates the release of the collective subconscious, especially of its most repressed aspects. As Joanne Frye, an American educator and author of *Living Stories, Telling Lives* asserts, this would be particularly applicable to women who 'have found in novel reading an important means of gauging their own experience' after having being excluded from many forms of social consensus. In this sense, not only has women's traditionally marginalised position as outsiders placed them as recipients for the stories of others, but their memory in this position also 'includes stories of oppression and repression unknown to men'.

As in earlier Spanish *Bildungsromane*, which presented the psychological, moral and social shaping of the personality of its protagonists over a process of maturation, the female protagonists of *Crónica del desamor* reconstruct their past lives through their dictatorship and Transition memories. Although the recompilation of their experiences, memories, and voices, provides the reader with an alternative, and at the same time additional, testimony of the first years of democracy and of the immediate Francoist past, it is essential to remark that this portrayal is limited. The novel focuses on a group of middle-class, working, and mostly educated women in their thirties. Their political, cultural, familiar, and personal disillusionments form their particular account of life during that period. In the narration of this 'novella testimonial', the voice and opinions of the

author seem to have been filtered in an attempt to revise personal or transferred female experience.

#### THE EXPRESSION OF FEMALE EXPERIENCE, AND THE INVOLVEMENT OF THE READER

The protagonists of *Crónica del desamor* have already experienced the political disillusionment that went hand in hand with the fall of the Franco regime, and this disillusionment is now spreading to their personal lives. Elena, for instance, lives the end of her love story with Javier with infinite melancholy. But hers is a tearless break-up, and her feelings of tiredness and resignation to the irreversible are reminiscent of those experienced during her retirement from the Spanish Communist Party. As Rose Marie Marcone, Professor of Spanish at the University of Richmond, asserts, 'self-revelation replaces political revolution' in what appears to be the testimony of a group of female friends in their thirties in 1979 Madrid, when the novel was written and published. Although this testimony includes the memories, voices, and stories of different women, the similarity of their personal and emotional circumstances would suggest that they form a multiple, collective protagonist. Above all, what they have in common is their rejection of the Francoist ideal of woman, and their scepticism of the uncertain changes that other more progressive solutions could offer.

The different protagonists that conform the multiple protagonist are focalised through Ana, the witness protagonist who holds the novel together. Ana, a journalist single mother at the age of thirty, is the prototype of her group of friends: the group of all the Anas, of every Ana and of Ana herself, all of them being different yet the same woman. The reader learns about their stories, conversations, and everyday life accounts through an omniscient narrator who not only knows their past and future actions, but who is also aware of their memories, inner thoughts and feelings. Although the narrator is of objective nature, this narrator is responsible for conveying the political ideas of the protagonists, which indeed constitute the highly subjective political message of the novel. In a moment when the voices of women's rights movements were silenced in Spain by what was perceived as a more immediate need – the creation of democracy – the narrator in *Crónica del desamor* rescues those voices and presents them to the reader. The reader becomes involved through identification between the protagonist and the author on one hand, and between the narrator and the author on the other hand. Montero's ideas are therefore articulated through

the omniscient narrator, who attributes them to Ana in what Mikhail Bakhtin calls the 'double-discourse' of the novel. It is through this 'double-discourse' that the author appropriates the utterances of the narrator as the utterances of another speaker, and is able to use them for her own political aim.

The witness protagonist, Ana, is a young journalist like Montero herself. Working in a male-dominated industry, Ana is under the impression that, were she a man, her efforts at work would have been better valued. Writing is very important to Ana, both professionally and for her personal development. This coincidence between Ana's and the author's professions does not appear to be casual, for the novel contains autobiographical hints as part of a broader feminist concern. In this sense, the initial sensation of identification between protagonist and author moves on to a sense of identification between Montero and the narrator, in charge of conveying the novel's ideological message. As far as the voicing of the author's thoughts is concerned, the novel is full of jibes aimed at both Franco's Spain and at how little women's lives have changed since its fall. Abortion, for example, was illegal under Franco, and this prohibition was enforced by invasive government action. Given that the law did not pass until 1985, abortion was still illegal practice during the Transition, when *Crónica del desamor* was written. Although it was not uncommon for well-off Spanish women to travel overseas in order to have abortions, other not so wealthy women were forced to put up with clandestine, high-risk terminations in Spain. Occupying one of the first positions in the feminist agenda of that period, abortion is the subject of one of Ana's diatribes:

*'Piensa Ana que si los hombres parieran el aborto sería ya legal en todo el mundo desde el principio de los siglos [...] estos guardianes del orden genital ajeno pagarán sin duda un raspado internacional a sus hijas descarriadas, mientras otras mujeres han de someterse a carniceros españoles e ilegales'*

*'Ana believes that were men able to give birth, abortion would be legal since the beginning of time [...] whilst those watching other people's genital order will not hesitate to provide their unruly daughters with an international suction and curettage procedure, other less fortunate women are however forced to put up with Spanish illegal butchers'*

However, the narrator does not appear to be voicing Ana's thoughts in this paragraph, but the thoughts of the implied author, Montero herself. According to Roberto Manteiga, Professor of Spanish in the University of Rhode Island, Montero's wish to create a literary work of art was secondary to her desire to convey her feelings and her distress about a range of feminist matters in the early stage of her career. Her ideas are therefore articulated through the omniscient narrator, who attributes them to Ana in what Mikhail Bakhtin calls the 'double-discourse' of the novel.

In his work of literary theory *The Dialogic Imagination* (1975), Bakhtin introduces the concept of 'dialogism'. The dialogic work carries on a continual dialogue with other works of literature and other authors. The term 'dialogic', nonetheless, does not just apply to literature, for all language is dialogic, dynamic, relational, and therefore engaged in a process of endless redescriptions of the world. In this sense, Bakhtin distinguishes monologue, single-voiced discourse, from dialogue, double-voiced discourse. Dialogic discourse, in its relational nature, contains a deliberate reference to someone else's words. In the case of *Crónica del desamor*, the narrator's words, which he or she attributes to Ana, are but a clear reference to Montero's words. Thus, Montero, the author of these double-voiced statements, appropriates the utterances of the narrator as the utterances of another speaker, using them for her own purposes. Hence, as the audience of these double-voiced statements, the reader is offered both the original utterance as Montero's point of view, and the narrator's evaluation of that utterance from another point of view. The author's intentions are finally refracted through the narrative voice which, whilst objective, succeeds to convey the subjectivity of Montero's opinions.

By revealing these not so well known female memories of the Franco period and of the Transition years, the reader is given the opportunity to gauge their own experience. Whereas the variety of voices in *Crónica del desamor* provides the novel with a diverse, dynamic and multiple narration, which comes in clear contrast to the patriarchal, unique viewpoint narration, this is not the only vehicle to express female experience under Franco. The targets for transformation come in the form of the profound feminist criticism of Spain during the Transition, voiced by a narrator who attributes that criticism to the novel's protagonists.

*Mazal Oaknin is an MPhil student in Spanish Literature*

#### Further reading

1. Joanne S Fry, *Living Stories, Telling Lives: Women and the Novel in Contemporary Experience*, 1986
2. Roberto Manteiga, *The Dilemma of the Modern Woman: A Study of the Female Characters in Rosa Montero's Novels in Feminine Concerns in Contemporary Spanish Fiction by Women*, ed. Roberto Manteiga, Carolyn Garlerstein, and Kathleen McNerney, 1988
3. Rosa Montero, *Crónica del Desamor*, 1994



Rosa Montero, photographed by Anna Löscher

## Sinister Interests

The 2009 MPs' expenses scandal has shown the naivety of trusting our politicians to display noble and righteous conduct. Bentham warned us 200 years ago that politicians are selfish creatures who need clear incentives if they are to work in the community's best interests. Is it time for performance-related pay for MPs, asks [James Shafe](#)?

**A** KEY LESSON OF 2009 is that we will get the best out of our MPs only by catering to the worst in their natures. In 2009, the *Daily Telegraph* published a series of expenses claims made by MPs from all three main British political parties. Officially, MPs can only claim parliamentary expenses for costs 'wholly, exclusively and necessarily incurred for the performance of a Member's parliamentary duties.' However, the claims published by the *Telegraph* revealed widespread and systematic abuse of the system. A number of explanations of the scandal have been offered by the popular press, but naive trust underlies many of them.

Should we blindly trust our MPs not to abuse the system in this way? The 2009 expenses scandal suggests not. The British political philosopher Jeremy Bentham argued 200 years ago that politicians should not be trusted to act selflessly. His analysis of power explains why secrecy caused these recent misdemeanours,

and suggests what can be done to prevent their reoccurrence. Addressing the problem requires clear rewards and punishments for 'success' and 'failure', and a definition of what these mean in a political context, clarifying the rhetorical yet ambiguous language used by our politicians.

Bentham, unlike many political commentators, carefully emphasised the fallibility of those who wield power. He warned against relying on politicians' benevolence and argued that we should instead assume their 'sinister' self-interest. While other political thinkers have also emphasised politicians' self-interestedness – for example David Hume's in his 1742 essay 'Of the Independency of Parliament' – few provide a more comprehensive explanation of how to harness egoism than Bentham. Like an owner who trains his reluctant dog to obey by rewarding him with biscuits, Benthamite political systems make governors self-interestedly

Facing page: Tiepolo's Dog (2008) Oil on Canvas 30" x 40"

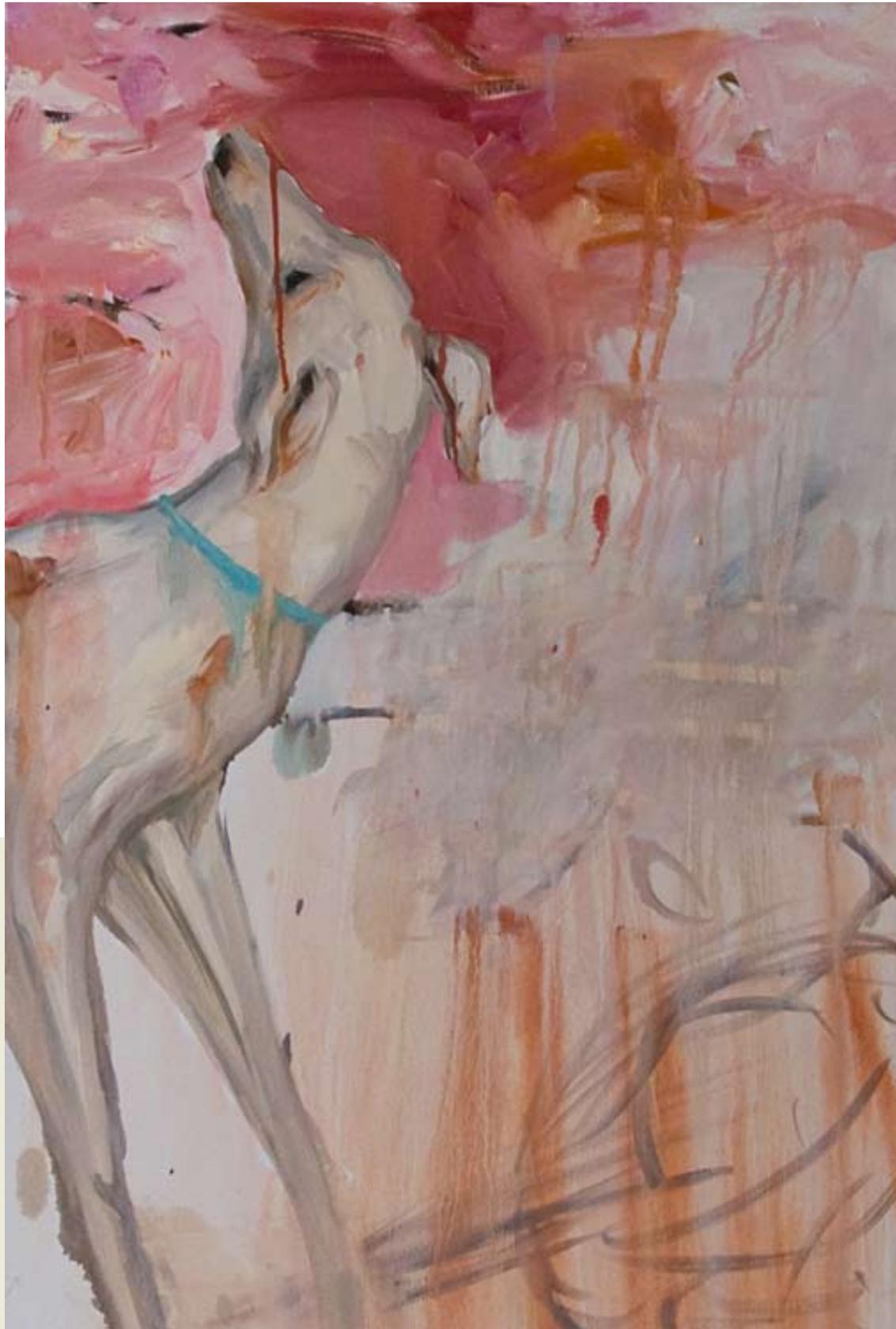
'I stated, in speaking of Venetian religion, that the Venetians always introduced the dog as a contrast to the high aspects of humanity. They do this, not because they consider him the basest of animals, but the highest – the connecting link between men and animals; in whom the lower forms of really human feeling may be best exemplified, such as conceit, gluttony, indolence, petulance. But they saw the noble qualities of the dog, too; – all his patience, love, and faithfulness; therefore Veronese ... has painted one great heroic poem on the dog.'

John Ruskin, *Dogs as Painted by the Venetians and Others*, Selections from the Writings of John Ruskin, 1862.

'Tiepolo relieves dogs of all social responsibility. Through size, placing, coloration, shape and angle of address, they concentrate visual interest as strongly as they people they appear with, while diverting us from human affairs. Their ordinariness is an attraction for Tiepolo: They were available in most of Veronese's paintings, and he took them up from there, one by one.'

Alpers and Baxandall, *Tiepolo and the Pictorial Intelligence*, Yale University Press 1994.

Georgie Flood is an MFA student at the Slade School of Fine Art





Jeremy Bentham, by Henry William Pickersgill

desire to serve us. Conversely, MPs should be wary of harming us (through excessive expense claims or corruption) because the repercussions of these actions will be detrimental to them. Like dogs who respond to treats, MPs react more to praise and blame, financial rewards and fines, than high-minded ideas. Anyone who understands the self-interest of MPs should not be shocked when some of them act improperly when confronted with temptation and secrecy.

Communities can play an active role in promoting good governance, because public opinion provides some of the incentives needed to make egotistical politicians serve our collective interest. The threat of being discovered and exposed should, in principle, scare the corrupt or inept. In his essay 'On Packing', Bentham argued that libel laws work against the public interest because they prevent corruption being held up to public view. These criticisms have particular resonance in Britain given the exploitation of the country's

famously tough libel laws to protect commercial interests. Specialist media lawyers such as Carter-Ruck have recently used super injunctions to stifle public criticism of their corporate clients. The paperwork for these injunctions (proceedings for which often take place in secret) are anonymous, so that no researcher going through court records could ever learn of what happened.

Similar secrecy has until recently surrounded MPs' parliamentary expenses claims. Yet many commentators have seemed almost surprised that politicians act improperly under cover of secrecy. For Bentham, this would have been no surprise: how else would egoists act when there is little chance of getting caught? What is truly dangerous, however, is for the sources of politicians' personal interests (including donations and expenses) to remain secret, because this makes public figures feel invulnerable to the threat of public opinion. In Bentham's words, secrecy allows the powerful to indulge in 'sacrifices of public welfare to private convenience.'

The expenses scandal demonstrates that while public exposure is a necessary tool, it is nevertheless not always a sufficient one. In October 2009 Prime Minister Gordon Brown asked former senior civil servant Sir Thomas Legg to lead an independent report into abuse of the expenses system. His letters to MPs, suggesting that they repay various amounts, demonstrate the strengths and weaknesses of relying on publicity. Bentham assumed that the community's condemnation would often be enough to deter wrongdoing because the displeasure we feel at others' disapproval is a strong deterrent. Clearly, though, this 'social' sanction' is not always enough. Faced with public revulsion at their behaviour, some MPs still insist that their claims were justified and ignore public outcry. James Purnell MP, for example, faces no danger of deselection, despite claiming over £9000 to cover grocery bills whilst earning over £140,000 per year. For the well-connected and experienced, claiming for cleaners and duck houses might be embarrassing, but its revelation is not career-ending. The shame of exposure can deter many, but not all culprits.

Part of a positive agenda for regulating selfish politicians' behaviour would ensure that they are not only punished for corruption but also rewarded when they serve communities well. As shown by numerous MPs' behaviour, monetary and not merely social sanctions are required. This raises the wider question: if, like the rest of us, legislators need the threat of

exposure, losing elections or even prosecution to deter bad conduct, what positive rewards could encourage good governance?

Influential public policy theorists such as LSE professor Julian Le Grand draw the distinction between systems that presuppose actors' motivation by self-interest, and those that assume a measure of benevolence. Le Grand argues that a mix of the two is required for any policy to effectively manage behaviour. Self-interest is used as a tool by policymakers to influence most agents in society. We use taxes, advertising and legislation to 'nudge' or even push people towards desirable actions like giving up smoking, going back to work or using less petrol. So far, politicians have been immune from these kinds of incentives, but it is unclear why. Current public policy suggests that we need rewards to shape the behaviour of such diverse social groups as smokers, drinkers, drivers, low-paid workers and mothers. Why should MPs be any different?

Recent events have already established the political necessity and principled need for an independent authority to assess MPs' pay. An obvious way of rewarding politicians' 'good' behaviour would be to link some component of their pay to 'success'. Hammering out the details could be a complicated and controversial process. First we would need an independent authority to define (admittedly rough) measures for the successful results of parliamentary activity (UK median income, the number of people in poverty, the number of failing schools). Quangos like the Care Quality Commission, Ofsted and Ofgem do something similar for a range of services from care homes and GPs to schools and energy suppliers. Different measures could apply to ministers of each government department, with separate criteria for those MPs in opposition or who serve on select committees or other parliamentary bodies. Of course, for Bentham such debates should be conducted in terms of utility (the creation of people's happiness): the single, universal currency of value.

Performance-related pay for MPs would be met with an obvious objection: how can we really measure success in something as complicated as politics? Any numerical measure of political 'success' will be always be controversial. This controversy could however, be an opportunity rather than a problem. By debating, openly and transparently, what political 'success' means to us, we could clarify what we really believe is important. Conservatives might propose that a portion of pay be determined by measurements related to home-ownership, GDP or inheritance, whilst progressives

might prioritise measures of child poverty or social mobility. By debating what constitutes success, the political class can tell voters where they really stand; what kind of society they want to create. Unanimous consensus on the more contentious measures might not be possible, but voters could understand which explicit objectives they are endorsing by supporting a particular party. The level of parliamentary support for certain contested objectives could then determine whether they are adopted for the life of that parliament. Another portion of performance-related pay might relate to less contested measures of activity, such as attendance at House of Commons debates or service on select or standing committees.

Instead of hoping that politicians are incorruptible, we must assume that they are easily tempted. This means rewarding good performance, punishing corruption and publishing information so that the corrupt are scared of being caught. Politicians' fallibility means that communities must be consistently involved in the political process – even between elections – if power is to serve their interests. The idea of using incentives for MPs performance may appear outlandish, but this is no reason to dismiss it. Things can change very quickly, as the panic flowing around Westminster following Thomas Legg's initial letters shows. The past few months prove that naively expecting the best will not work: MPs, like the rest of us, respond to incentives. Accepting and taking advantage of this fact will continue to be a real challenge.

*James Shafe is a postgraduate student in the UCL School of Public Policy*

## Further Reading

1. J Bentham, *The Elements of the Art of Packing as applied to Special Juries, particularly in cases of Libel Law*, 1821
2. P Schofield, *Utility and Democracy: the Political Thought of Jeremy Bentham*, 2006
3. J Le Grand, Knights, Knaves or Pawns? Human Behaviour and Social Policy, *Journal of Social Policy*, 1997

Also see UCL's online collection of works by Bentham: [www.ucl.ac.uk/Bentham-Project/info/wwwtexts.htm](http://www.ucl.ac.uk/Bentham-Project/info/wwwtexts.htm)



Market and Ornithology Centre



Locality Arial View



Local Centre



Vision

# Nautopia

TREATING OCEANS AS MERE FISHERIES has already proved an immature worldview. In the past fifty years we have eaten 90% of the world's big fish and destroyed half of the coral reefs in the seas and oceans.

The idea we are exploring is a culture set on water, where people have different values for life: they are living sustainably and consciously and are socially and environmentally active. Our animations and models depict different speculative scenarios. Marine objects are delegated various specific functions, but are also encouraged to stay sustainable and

independent. Ships can be part of the city organism as a whole, or detach themselves without damaging the system.

Our project demonstrates a detailed analysis of the North Sea region. The Dover Channel proved to be one of the best locations for a new type of offshore city as a 'filter' on the channel.

Our goal is to find out if it could be a futuristic answer to the environmental and social problems of today's 'land urbanism'. Our challenge is to design a better quality of living in comparison to the current model.

*VITAMIN (Vytautas Jackevicius and Mindaugas Skrupskelis)  
MArch Urban Design, Bartlett School of Architecture*



Nautopia Panorama

# Ethical Imperialism or The Origins of Speciesism

*'Man is the only animal that laughs and weeps, for he is the only animal that is struck with the difference between what things are and what they ought to be.'*

William Hazlitt (1878–1830)

In a secular society, on what foundations can we build a code of ethics? Is there such a thing as an objective moral value? [David Jobanputra](#) forecasts where ethics might be headed in the 21st century.

OUR SOCIETY IS FORGED UPON IDEALS of the sanctity of human life, though paradoxically the chief authority of the age, the decontextualised rationality of science, upholds no such belief. That the life of the individual human is more valuable than that of another species, let alone that it is somehow 'sacred', is a notion in direct contradiction to the West's founding ontological model, namely the theory of evolution, and is largely derived from archaic theological and philosophical separations of humanity and 'nature'.

The implications of this are far-reaching, but cannot be reasonably accepted. The current strategy is to try to widen the privileged domain of 'humanity', granting citizenship to some genetically-similar and charismatic mega-fauna, such as the higher primates. Still the arbitrary factors – language, transmitted learning, tool usage, self-recognition, etc. – that once accounted for humanity's self-separation from the rest of creation are employed here. Other life, meanwhile, remains unquestioningly of lesser value.

What is the future of such attempts at ethical imperialism? Can other species be given the rights of humans, and should they be? Would they want them? Applied ethics works solely as an anthropocentric model of customs and values. Human beings, by virtue of their evolutionary past, are not geared towards the protection of other species (except perhaps for domesticates, most of which enjoy protection only preceding preda-

tion). A human ethical code is thus heavily skewed. For humans, operating within the dual streams of evolution and ethics, existence is an unceasing trade-off between 'natural' (evolved) and 'cultural' (moralised) behaviours. No other species exhibit such dynamic restraints on their behaviour; they are, if you like, immersed solely in the evolutionary stream and so should arguably not be afforded human ethical consideration, albeit in a completely revised fashion.

What alternatives exist to extending the boundaries of personhood and its concomitant system of 'rights'? It is now widely believed, if not with any demonstrable change in attitude, that humans, animals, plants and other life forms have evolved from the same stock in a process that began around 3.7 billion years ago. One might fairly suggest, therefore, that all life is in fact of equal status. Extending the logic of ethics, one might well conclude that our interactions with other life forms should not exhibit preference or prejudice, also known as *speciesism*. Needless-to-say, such a position is untenable. Most life forms depend on the consumption of other life for their continued existence, often only accomplished through cooperation with other members of the same species (pack-hunting). Preference and prejudice, it seems, are part and parcel of existence.

If other species can not reasonably be granted human moral status, should humans' ethical codes follow those of the rest of the natural world? In short,

should ethics exist at all? Such a question requires a detailed understanding of morality's evolutionary context. Darwin likened human morality to the altruistic behaviour of other social species, suggesting that, as for meerkats and flocking birds, altruistic acts, though of little or no benefit to the individual, are adaptive at the level of the group. In *The Descent of Man* he writes:

*'It must not be forgotten that although a high standard of morality gives but a slight or no advantage to each individual man and his children over the other men of the same tribe, yet that an increase in the number of well-endowed men and advancements in the standard of morality will certainly give an immense advantage to one tribe over another. There can be no doubt that a tribe including many members who, from possessing in a high degree the spirit of patriotism, fidelity, obedience, courage, and sympathy, were always ready to aid one another, and to sacrifice themselves for the common good would be victorious over most other tribes; and this would be natural selection'*

For Darwin, morality represented not humanity's most vital break from the tyranny of nature, as some still hold, but rather an evolved response to inter-group competition. As such, it was not associated with the belief in the immutable sanctity of human life, which owed its existence to the dualist epistemologies of Judeo-Christian doctrine and Cartesian philosophy. Instead, moral tendencies functioned, at least initially, as a means for ensuring group survival. The human propensity for unselfish acts thus stems from an innate capacity for social cooperation in the name of one's family, tribe or clan. It is neither inclusive of other species nor indicative of the inviolability of human life.

Human ethics, then, has a biological origin, one which has been instrumental in our cultural evolution. Biomorphising ethics – bringing human morality in line with that exhibited by the other species – is therefore not a solution, for this would demand a deconstruction of age-old systems of laws and rights, upon which all civilisation has been constructed.

We have now rebuilt some parameters for our understanding of ethics. Ethical judgements cannot reasonably be applied to any species others than our own, as this is to betray the origins and function of morality. Neither can ethical codes be totally jettisoned, as this

*Most people in the western world are confronted by moral ambiguities on a daily basis. Many of these stem from apparent contradictions to the idea that all human life is holy. We are, for example, less concerned by the loss of human life in far off places than on our own doorstep*

would be to commit societal suicide. Instead, we must acknowledge the limitations of our value systems and seek to apply and refine these only within our species.

This brings us to the problem of empathy. It is all very well to state that our morality is merely a device for ensuring our clan's survival, but what of the myriad permutations and nuances that now, after thousands of years of cultural development, constitute a society's ethical code? Surely, in seeking to iron out every inequality, human morality has truly attained a righteous position? This is a question best left to the ethicists. The notions of right and wrong, though by no means universal, are so much a part of most cultures that to question them is to risk accusations of sociopathy. Despite this, most people in the western world are confronted by moral ambiguities on a daily basis. Many of these stem from apparent contradictions to the idea, mentioned previously, that all human life is holy. We are, for example, less concerned by the loss of human life in far off places than on our own doorstep (which, incidentally, fits well with the Darwinian perspective). Whether it is desirable to attempt to 'rectify' these contradictions, that is, whether we should strive to expand upon our evolved capacity for altruism and empathy, is again dependent on this notion of human life as sacrosanct. This is a problem which has only originated within the last two or three thousand years, perhaps since the development of city states, and which has only really gained currency since the dawning of global mass media.

Most people feel a moral obligation towards their family and local community. Others extend this feeling to their country (patriotism). In more recent years many people have been encouraged to include all humanity in their moral community, a situation facilitated by global mass media, which can trigger empathy – originally reserved for our close kin – from a great distance. In the days prior to widespread media coverage of wars and famines, such events were morally unproblematic. Now, however, television images engage our empathetic

brains, giving rise to apparent moral ambiguities. In a similar vein, the separation, objectification and commoditisation of domestic animals (and the extinction of some wild ones) is causing increased confusion for that part of our reason that serves to protect our close kin. Vegetarianism and wildlife protection agencies are just two phenomena triggered by this ancestral predisposition to kin protectionism.

What can be done about these alleged moral ambiguities? Should we confine altruistic acts to our closest kin, as 'dictated' by our evolutionary history, or should we confront our 'hypocrisies' and strive to extend protection to all humanity (as suggested by our 'evolutionary present')? These questions prompt further, larger ones. Again, the idea of human life as sacred demands we seek to look out for all our species. But once the myth of sanctity is neutralised, where does that leave us? To whom, if anyone, do we have moral obligations? In this modern atomised society the idea of a moral community of close kin has lost all meaning; is this therefore also true of the concepts of good and bad, right and wrong?

The answer to such questions, if any indeed exists, lies within the domain of meta-ethics. Meta-ethical schools of thought are commonly divided into *realist* and *anti-realist*. Theorists of the former hold that moral values are objective, intrinsic properties of the world that are simply discovered or intuited. Anti-realists, to the contrary, assert that moral values are contingent on the history and belief systems of individuals and cultures, and that differing moral codes are as numerous as there are people on earth. It is here not my intention to provide tentative responses to the above anomalies. Rather, I wish to explore the nature of this dilemma in the hope of shedding light on some causal mechanisms.

It should be apparent that the paradox discussed here is above all else a secular problem: unlike moral codes enmeshed in religion, secular ethics afford no consensus and no ultimate salvation. Morality, extrapolated over centuries by human reason, is now crumbling under the weight of global relativism (akin to what Henri Bergson termed the 'dissolving power' of human intelligence). The real issue here is not so much 'what is good:bad/right:wrong?' as 'how can we agree on a notion of good:bad/right:wrong?' It is this writer's opinion that the lack of consensus on moral issues in western secular society derives from the decontextualisation of many fields of knowledge, such as scientific and economic thought. By disembedding such knowledge, reducing it to that which can be

tested empirically, modelled and predicted, we have inadvertently narrowed our realm of understanding and meaning. Economics, for instance, gives objects, experience and beings a specious commensurability. From Roy Rappaport's *Ecology, Meaning and Religion*:

'The application of a common monetary metric to dissimilar things reduces their qualitative distinctiveness to the status of mere qualitative difference. The most appropriate answer to questions of the type "What is the difference between a forest and a parking lot?" becomes so many dollars per acre'

Of great importance to the sustainability of human societies is 'higher-order meaning' (a term coined by Rappaport). This refers to metaphor, symbol, aesthetics and so on. British anthropologist Gregory Bateson, among others, argued that such levels of meaning compensate for the inability of the linear, problem-solving nature of human consciousness to comprehend the circular connectedness of living systems. In other words, aesthetics, ritual and so on can make people aware of the holistic nature of existence by alluding to underlying unity. A common understanding of this could do much to dampen the pathological insecurity of modern moralists.

What does this mean for the future of ethics? Given the failure of conscious reason alone to construct solid moral foundations for secular society (as described above), it seems much could be gained from re-embedding ethical knowledge. Through a more holistic conception of the nature of living systems – their circularity and interconnectedness – we would be better qualified to answer questions relating to the way in which individuals should act in the world. This is a less a matter of building watertight moral systems as it is of gaining some perspective on, and reverence for, the systems of which we are a part. It should be of little surprise that all cultures and creeds who have managed their societies and environments sustainably have exhibited a heightened awareness of their part in a great network of life, coupled with respect for each node and interconnection. The future course of ethics, if it is to be anything other than deleterious, depends on realigning it with the spiritual and, in so doing, restoring meaning to the natural world.

David Jobanputra is a PhD student in the Department of Anthropology

## The Curative Powers of Diamond

Diamond is a promising material for biomedical applications, due to its low toxicity and inert nature. In the future, nanodiamonds, tiny spherical particles of diamond, could be used as a component of implantable devices or as drug delivery vehicles. However, as Katherine Holt explains, it is important to understand the interactions of this exciting material with human body tissues, as it seems that the surface of nanodiamond may not be as inert as expected.

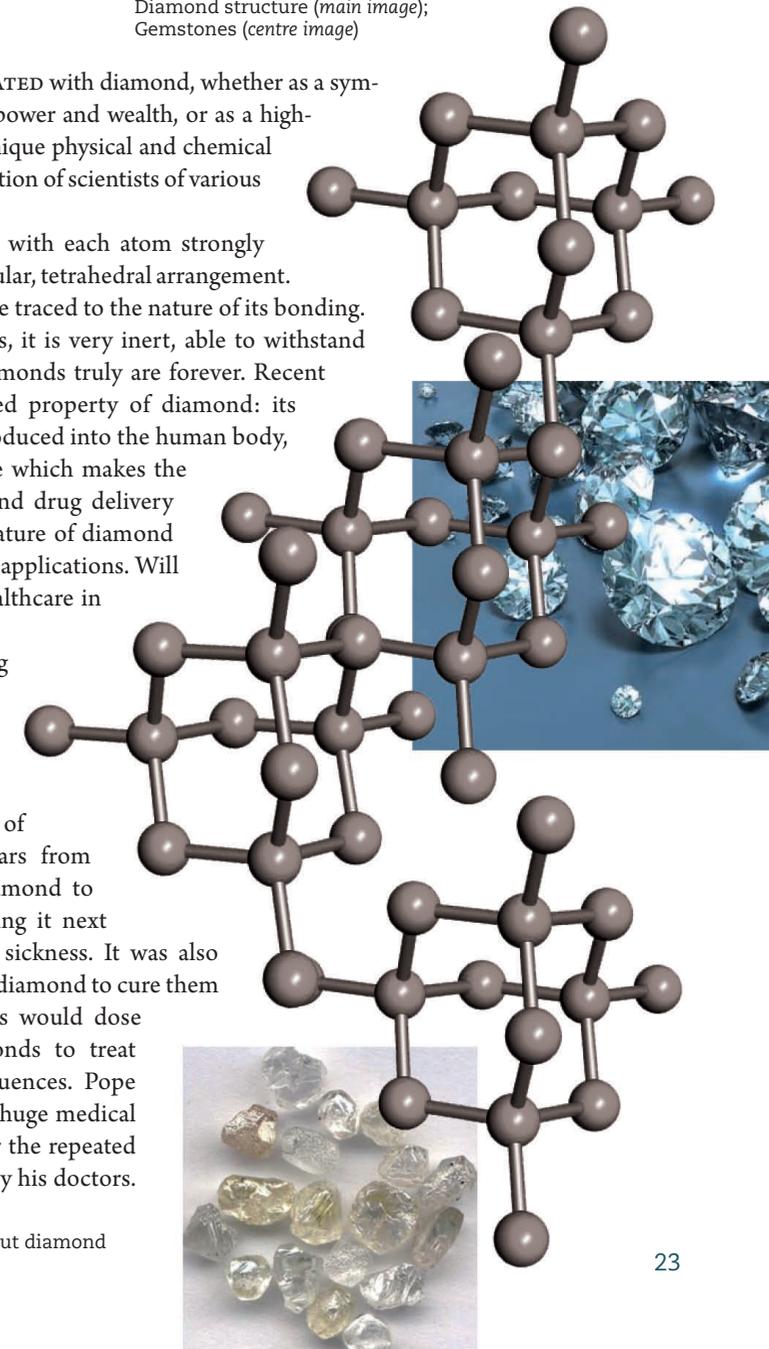
Diamond structure (main image); Gemstones (centre image)

**M**ANKIND HAS ALWAYS BEEN FASCINATED with diamond, whether as a symbol of eternal love, an indicator of power and wealth, or as a high-tech material. In recent years the unique physical and chemical properties of diamond have attracted the attention of scientists of various disciplines.

Pure diamond consists only of carbon, with each atom strongly bonded to its four nearest neighbours in a regular, tetrahedral arrangement. All of diamond's remarkable properties can be traced to the nature of its bonding. With all available electrons tied up in bonds, it is very inert, able to withstand attack from even the strongest of acids. Diamonds truly are forever. Recent research has focused on exploiting a related property of diamond: its biocompatibility. Many materials, when introduced into the human body, are toxic, or elicit an inflammatory response which makes the development of implants, imaging agents and drug delivery vehicles problematic. The inert, non-toxic nature of diamond seems to make it an ideal candidate for these applications. Will diamond become a major component of healthcare in the future?

Diamond has been regarded as having magical curative powers since ancient times. In his 'Natural History', Pliny the Elder (23–79 CE) claimed that diamond 'prevails over all poisons and renders them powerless, dispels attacks of wild distraction and drives groundless fears from the mind.' In the middle ages taking a diamond to bed, breathing on it while fasting or wearing it next to the skin were all accepted remedies for sickness. It was also recommended that liars and scolds suck on a diamond to cure them of their bad habits! 16th-century physicians would dose their wealthy patients with ground diamonds to treat stomach disorders, often with dire consequences. Pope Clement VII died in 1534, with a reportedly huge medical bill for 14 spoonfuls of precious stones, after the repeated ingestion of powdered diamond prescribed by his doctors.

Rough uncut diamond



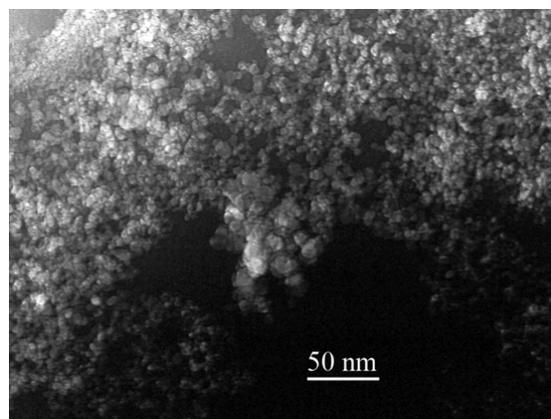


Even as late as the 19th century some wealthy Indian citizens attempted to repair tooth decay through the application of diamond powder.

Whilst diamond was regarded as curative by some, others realised that it could be used as a poison, leading to diamond dust becoming a popular (if expensive) means of assassination during the Renaissance. According to legend Beyazid II, the Sultan of the Ottoman Empire, was murdered by his son in 1512 after his food was dosed with a large quantity of diamond powder. William Crook, a member of the Bengal Civil Service at the start of the 20th Century, wrote:

‘..as an irritant poison, pounded glass has often been used. But diamond dust enjoyed a still higher reputation...it is believed in South India to be at once the least painful, the most active and infallible of all poisons. It was kept as a last resort in times of danger.’

Even uncrushed diamond has been alleged as a poison, although it is likely that this was a rumour started in the diamond mines to discourage gem thieves, whose



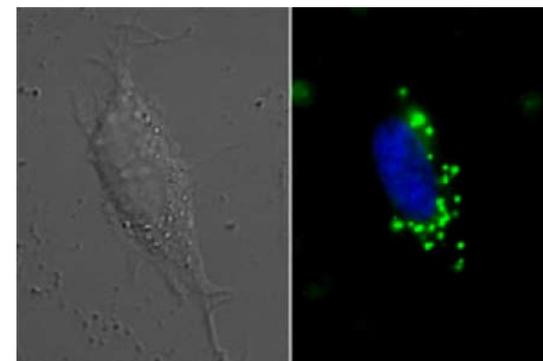
favoured method was to swallow the uncut stones and then allow nature to take its course.

So which is correct – will diamond kill or will it cure? If used correctly, there is great hope it may cure. Nanodiamonds, tiny spherical diamond particles of 5 nm diameter formed as a product of explosion, are a relatively unexplored form of diamond. This material was discovered in the Soviet Union in the 1960s but only in the last few years has it been posited for biomedical applications. Its small size, ability to be dispersed in water and the relative ease of surface functionalisation may allow its use as a drug delivery vehicle of the future. These properties, coupled with its low toxicity and robust and inert nature, make nanodiamond a promising candidate as a component of implantable devices and cell growth platforms.

*No one has yet shown how diamond is cleared from cells, with the distinct possibility it could hang around in the body forever*

Dean Ho and co-workers at Northwestern University USA have shown how nanodiamonds can be coated with a liver cancer drug, Purvalanol A, and a breast cancer drug, 4-hydroxytamifloxen, without loss of drug activity. Ordinarily these therapeutic compounds are only soluble in solvents such as ethanol, which makes clinical administration problematic. However, drug-coated nanodiamonds can readily be suspended in water, allowing new treatment routes. The same group has shown how insulin may be attached to nanodiamond particles, where it remains bound and inactive until the solution is made more alkaline. This change in pH causes the insulin molecules to detach from the nanodiamond surface and dissolve in the solution, where they regain their enzymatic activity. This property could be used for targeted wound healing, as an increase in alkalinity has been shown to occur in infected wound tissue. Insulin is known to accelerate wound healing by acting as a growth hormone and this means of delivery would allow targeted treatment at specific sites of injury.

While these posited applications of nanodiamond are very exciting we must be cautious about introducing such materials into body tissues without assessing potential toxicity. An advantage of diamond is that it will not biodegrade and release toxic materials within the body; cells have been shown to readily take up nanodiamond with no apparent ill-effect. However, no



Fluorescent diamond nanoparticles within a cell. From: TL Wee et al., *Diamond & Related Materials*, 2009

one has yet shown how the material is actually cleared from cells, with the distinct possibility it could hang around in the body forever. In nanoparticles, a high proportion of the total constituent atoms are found on the surface (15% for a 5 nm diameter nanodiamond particle). As it is the surface atoms that come into contact with body tissues, it is essential to understand the surface chemistry of these particles, and to study how they may interact with their environment. There is growing evidence that the surface of nanodiamond is not as inert as expected. Our research group has found that nanodiamond can accept and lose electrons when immobilised on an electrode surface. It can also spontaneously oxidise and reduce molecules dissolved in solution. As diamond is a ‘textbook example’ of an insulating material and is unable to conduct electricity, this remarkable ability of nanodiamond to donate or receive electrons is unusual and requires further investigation. As biological processes also involve the movement of electrons it is important that we assess how their mechanisms may be influenced by the presence of nanodiamond. For a material with such a long history and simple chemistry it seems there’s still a lot to learn. There’s certainly more to diamond than just a pretty face.

*Katherine Holt*

#### Further reading

1. Robert A Freitas Jr, *Nanomedicine, Volume II A: Biocompatibility* ([www.nanomedicine.com/NMIIA/15.1.1.htm](http://www.nanomedicine.com/NMIIA/15.1.1.htm))
2. Mark Chen et al., *Nanodiamond-Mediated Delivery of Water-Insoluble Therapeutics*, *ACS Nano*, 2009

## Is There Such a Thing as a Difficult Language?

Of all the European languages, Finnish has a reputation for being ‘difficult’. Its status as ‘the most difficult language in the world’ is perpetuated by native speakers and foreigners alike. Over the past two years historian [Mary Hilson](#) has grappled with learning Finnish in order to read original sources and became intrigued by this question of difficulty. Where does the idea of Finnish as a difficult language come from and how much truth is there in it?

THE REPUTATION OF FINNISH for being ‘difficult’ is based on several factors. Finnish is a Finno-Ugric language, i.e. non Indo-European, so the vocabulary is mostly unfamiliar to speakers of other European languages. At first glance, Finnish simply looks very strange. If you have never studied it then you are not going to be able to guess easily the meaning of ‘*Koirankakkaveroko epäoikeudenmukaista?*’ or of compound words such as ‘*työajankohdentamissuunnitelmat*’, or ‘*omenatäysmehutiivisteestä*’. It is also a so-called ‘agglutinative’ language. In agglutinative languages, affixes (morphological markers) are added to the stem of the word to change its meaning. What this means in Finnish is that suffixes (endings) are added to express tense, number, case and so on. To give an example, *Suomi* means ‘Finland’ in the nominative form (the country and the language) but *Suomessa* means ‘in Finland’; *Suomeen* means ‘to Finland’; and so on. There are fifteen grammatical cases; even the direct object can be expressed by two cases (accusative and partitive).

Finnish is spoken by about 5 million people in Finland, and by fairly small communities in Sweden, Norway and elsewhere. It is fairly closely related to Estonian and Karelian but not much else. So most learners, including those living in Sweden, will have had very little exposure to Finnish unless they have spent some time in Finland.

So much for the difficulty. On the other hand, there are also some straightforward things about Finnish. The vocabulary is very systematic: *Kirja* (book) has to be learned, but once you have grasped that then *kirjailija* (writer), *kirjasto* (library), *kirjallisuus* (literature) and so on are relatively easy. The rather systematic grammar seems to give the language an unusual flexibility for making verbs out of nouns and vice versa, and for coining neologisms out of compound words: *tietokone*, literally ‘knowledge machine’ to mean ‘computer’ is a common example. My personal favourites among these compound words include *huonekalu* (‘room tools’ = furniture) and *lohikäärme* (‘salmon snake’ = dragon). There are also far more loan words from Swedish than many people realise. Moreover, Finnish is semantically quite close to Swedish, which is not surprising given the long shared history between the two countries.

In addition, the grammar is logical and there seem to be very few irregularities, especially as far as the verbs are concerned; there is no grammatical gender and no future tense; there are no articles, and no distinction between definite and indefinite form (a peculiar difficulty of Swedish, for example) and the spelling is entirely phonetic (there is no ‘ough’ problem, or any of the other eccentricities that plague learners of English).

If Finnish really is so difficult, why do 5 million people speak it apparently effortlessly as their mother tongue? And, more pertinently, if it is so different, why are so many of those 5 million Finnish speakers able to speak excellent English?

Ever since the beginnings of the discipline linguists have sought to sort and classify different languages, and to create typologies. Norwegian linguists Halvor Eifring and Rolf Theil, for example, distinguish between analytic and synthetic languages, agglutinative and flecive, different ways of organising word order, tone and stress languages. This seems to be straightforward. You don’t need to be a linguist to understand that Swedish, Norwegian and Danish for example, or Spanish and Portuguese, are more closely connected than French and German, or English and Japanese.

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But what about ‘difficulty’ and ‘complexity’? Some attempts to rank languages in order of difficulty are made by the institutions that teach them. The American military’s Defense Language Institute, for example, classes languages according to the amount of time required for its English-speaking students to achieve the same level of proficiency in speaking, reading and understanding. According to its website, category I languages include French, Italian, Portuguese and Spanish; category II German and Romanian; category III includes mostly languages with non-Latin scripts such as Persian-Farsi, Russian and Thai but also Polish and Turkish; while category IV includes Arabic, Chinese, Japanese and Korean. Perhaps not surprisingly, Finnish seems to lack the strategic significance that would force the American military to take an interest in it. Wikipedia suggests that the British Foreign Office had rated Hungarian (like Finnish part of the Finno-Ugric group of languages although it is very different) and Japanese as the languages requiring most time for its staff to learn, but I have not been able to verify this through a reliable source.

Perhaps more interesting and relevant for our purposes here is the Economic and Social Research Council’s (ESRC) statement on ‘difficult languages’, included as part of its information on postgraduate research funding. The ESRC will provide extra funding to enable researchers to gain proficiency in difficult languages, but its criterion of difficulty is based mostly on the resources available to assist in studying. The category of ‘most difficult’, for example, includes ‘unwritten languages or languages in the early stage of being analysed and for which no grammars, vocabularies or other learning aids are available.’ The least difficult languages are those for which there are learning aids, including ‘all European languages.’ However, for Group B languages, considered the second most difficult, reference is also made to languages using different non-alphabetic scripts, and to ‘languages which present intrinsic difficulties for speakers of English because they are click, tonal, object-verb-subject, *agglutinating*, etc.’ (emphasis added). Might one make a case for Finnish to be included here? I’m not

convinced that this is what is meant. The emphasis is on the importance of study resources, and although the range of Finnish language textbooks might not be the same as that for English or French for example, there is quite clearly an enormous difference between learning Finnish and learning for example a native American language.

Moreover, it’s not quite clear to me why agglutination should present so many problems to English-speakers. I had the advantage of studying Latin for six years at school, and although I have forgotten most of what I learned it did teach me the concept that word-endings may change meaning. And Finnish word-endings are relatively simple: the stem of the word often changes to take the ending (so Helsinki becomes *Helsingissä*, in Helsinki), but the ending itself (-*ssa/-ssä*) is always the same. Further, native Finnish speakers who have studied English will frequently mention prepositions as something particularly difficult that have to be studied hard to get right, and is there after all a very big difference between *tothecity/inthecity/fromthecity* on the one hand, and *kaupunkiin/kaupungissa/kaupungista* on the other? In fact, Finnish doesn’t make a distinction between the definite and indefinite article, so the English-learner also has to decide whether they mean *to the city* or *to a city*.

Although there is a growing literature on language pedagogy, it seems that there have been very few attempts made to establish a systematic typology of language in terms of difficulty for adult learners. Some general observations may be made. Cristina Ros i Solé (Principal Research Fellow at the UCL-SOAS Centre of Excellence in Teaching and Learning Languages of the Wider World) suggests that at least some of the following will be important: the motivation and commitment of the learners; their knowledge about the language and also the related culture(s); opportunities to practise the language with other speakers; and the availability and quality of textbooks and other teaching material (as suggested in the ESRC criteria discussed above). Above all, it depends on your starting point, and the relationship between your chosen language and the one you wish to learn. A German speaker will almost certainly find it easier to learn Swedish than a French speaker; most Europeans will find Chinese or Japanese harder than another European language.

To return to the current problem, this suggests two things to me. Firstly, so far as I have been able to discover, no one seems to be seriously suggesting that Finnish, or indeed any other language, is somehow intrinsically

difficult, and different in that respect to other languages. Secondly, it must follow that perceptions of difficulty must therefore be cultural, and we move instead to the statement beloved by Finnish language textbooks and teachers: *Suomi ei ole vaikea kieli, se on erilainen* (Finnish is not a difficult language, it is different).

If we look at the problem the other way round, it is not so difficult, after all, to understand why so many native Finnish speakers learn good English relatively easily. Finnish speakers are exposed regularly, and from an early age, to English through the media of films, music, computer games and social networking sites on the internet. In Finland, English is the language of choice for practically all encounters with tourists, business and professional contacts from overseas. It dominates academic writing, especially in the natural sciences. For English speakers wishing to learn Finnish, by contrast, it takes a special effort to expose yourself to the language outside Finland; even more to use it actively. There is nothing unusually Finnish about this; the same would apply to all the ‘small’ languages of Europe, including all of those that we teach in the UCL Department of Scandinavian Studies.

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*Material in Finnish language textbooks often seems quite explicitly to combine instruction in the language with instruction in how to be Finnish: texts about weekends at the summer cottage, how to appreciate nature, the etiquette of the sauna, and the frankly quite shocking statement that ‘Finns are silent and blond’*

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In the case of Finnish though, I would follow others including David Kirby, SSEES Professor Emeritus and himself a native English-speaker who learned Finnish, in suggesting that the difference and unfamiliarity of Finnish for English speakers, say, may have been accentuated by peculiar historical circumstances. As the Tampere University Professor Emeritus of Finnish Heikki Paunonen has commented, in the international edition of the newspaper *Helsingin Sanomat*, from the mid-nineteenth century Finnish nationalism was intimately connected with the language question. Finnish nationalists, many of whom spoke Swedish as their mother tongue, self-consciously adopted Finnish as the language of the true patriot, even to the extent of fennicising their names. The first two decades after independence in 1917 were marked by struggles over



the status of Finnish and Swedish, which were played out in Helsinki University in particular. During this period there were also attempts to claim kinship for the new Finnish nation with a wider group of Finno-Ugric speakers in Estonia and Hungary.

The result is a small country that is intensely nationalist in many ways, and where language and culture, language and national identity are assumed to belong together in a way which would be quite unthinkable for most speakers of English or indeed any other 'major' language. In my personal experience, this essentialism manifests itself in two ways. First there is the often unspoken assumption that no foreigner can or will be able to learn Finnish (the myth of difficulty again) and the surprisingly widespread inability or unwillingness of native speakers to tolerate heavily accented or broken Finnish, and to adapt their own speech to make it easier for a learner to understand. I don't wish to sound too critical here: it's by no means universal in any case (witness the many Finnish friends and colleagues who have patiently tolerated my own stumbling efforts). The tendency among people in Helsinki shops and bars to switch to English on hearing less than perfect Finnish is often well-meaning, but it's also extremely frustrating to the learner.

The second way in which this appears is in the material included in Finnish language textbooks, which often seem to combine quite explicitly instruction in the language with instruction in how to be Finnish: texts about weekends at the summer cottage, how to appreciate nature, the etiquette of the sauna, and the frankly quite shocking statement (in a book published in 2009), that *Suomalaiset ovat hiljaisia ja vaaleita* (Finns are silent and blond).

Maybe all this sounds like an excuse, and I have to admit that foreigners living in Finland are often equally complicit in the difficulty myth, especially if they speak

English as their native language. Everyone seems to know an English speaker who has lived in Helsinki for over twenty years without learning a word, though for every one of these there are, of course, others who are quietly getting along in various degrees of fluency. As for me, after one year of very part-time study in London and now nine months living in Finland, I've finally reached the point where I am confident enough to manage simple conversations and to work my way slowly through a text. Days and even weeks of intense frustration sometimes give way to moments of elation when you make a minor breakthrough and suddenly realise you can understand, or express yourself, in a way that previously seemed impossible. If nothing else, I can (sort of) keep up on Facebook and follow the daily adventures of Viivi and Wagner in a strip cartoon in a national Finnish newspaper, and, believe me, it's been worth it just for that. And on the basis of this experience the only sensible conclusion I can make is the following: learning a language, any language, is always difficult, and it certainly doesn't get any easier as you get older.

*Dr Mary Hilson is a Senior Lecturer in Scandinavian History*

### Further reading

1. Halvor Eifring & Rolf Theil: *Linguistics for Students of Asian and African Languages*, 2005
2. Sirkku Latomaa, 'English in contact with 'the most difficult language in the world': the linguistic situation of Americans living in Finland', *International Journal of the Sociology of Language*, 1998
3. Viivi and Wagner: [www.hs.fi/viivijawagner](http://www.hs.fi/viivijawagner)

## On the Perils of Crossing Disciplines

The practicalities of publishing in a journal some way outside your field can be thorny. Interdisciplinary barriers were not enough, however, to discourage Jim Croll from drawing on his engineering background to explore arctic rock formations, all from the comfort of his office chair.

AT HIGH ARCTIC ALTITUDES one can commonly observe striking stone circle formations with such regular geometric features that it might suggest an awful lot of people have been very busy creating stone-free areas within which they might grow their crops. The reality is quite different. These circles of segregated stones are in fact natural features that have evolved over a very long period following the last ice age. Earth scientists have many theories as to how these curious geomorphic features form, but seemingly none have so far proven adequate to account for all the known facts. These circles are only one of the many fascinating natural periglacial features whose origins I have recently found myself trying to explain.

It was while attempting to publish a short paper expounding my own theory of how these periglacial features might have developed (see Box) that exchanges with the reviewers gave me pause to ponder not only the formidable issues discouraging scientists and engineers from breaking out of their self-imposed silos but also on some important differences in approach that an engineer might bring to such problems. One of the less kindly reviewers of my piece was shocked by the audacity of someone who, in addition to not being an earth scientist, has also never even set foot upon permafrost. How could I possibly venture a view as to the possible mechanical causes of these quite spectacular natural phenomena? He was of course in one sense right. But he was also in another sense wrong. Let me try to explain.

At the risk of gross oversimplification, a scientist is generally concerned with explaining what exists. Whether this is a physicist designing ever more sophisticated tests to capture the existence of an even more fundamental particle making up matter, a cell biologist trying to better understand the signalling mechanisms responsible for cell division, or a

geomorphologist sitting patiently taking readings of the movements of stones in the gradual formation of stone circles, a common factor in the way science is usually conducted is the concentration on that which *exists*. There are, of course, many exceptions. In formulating his theories of relativity, Einstein grappled with abstract ideas, many of which took years of carefully planned observational experiments before being confirmed. An engineer, in contrast, is inevitably forced to grapple with that which does not yet exist. A structural engineer will need to develop conceptual models of what sort of loading is likely to be experienced; how a bridge or building will respond to these loads; how the sea wall will resist storm wave action and so on without the luxury of anything tangible upon which to observe behaviour. At the design stage all the potential forms of failure of the system need to be conceptualised, modelled and analysed to allow the design to be tweaked to ensure failure of that particular form will not occur. To be able to avoid it, the engineer must be able to visualise and then model each and every potential form of failure. Conceptual models need to be developed for each of these modes of failure backed-up by the mechanics



Formations of naturally occurring stone circles above Arctic permafrost



that controls them. In contrast with the scientist, the engineer must become comfortable in being able to model things that are not yet tangible.

In some sectors of engineering the designer is able to derive comfort that correct decisions have been made through the use of prototype proof testing. In the design of aircraft, for example, it makes sense to further check the validity of the design assumptions through exhaustive full-scale proof testing. A civil engineer, on the other hand, is rarely in a position to undertake such testing. Usually, the bridge, dam or tunnel will be unique to the particular set of circumstances and client specifications. They may be constructed in areas with geological, soil and environmental loading conditions very different to those of the closest historical precedent. They may also be at scales so large that it would be completely impractical to attempt any full, or even large, scale proof testing. But of course the very scale of the construction often means the consequences of failure are so horrendous that the safety imperative may be even higher than within the manufacturing sector. After all, a deficient car braking system, that somehow escapes all the design quality assurance processes, may result in a few unacceptable accidents, but it is likely the deficient cars will be quickly called-in and production ceased until the deficiency is put right. A meltdown of a nuclear reactor core, the catastrophic failure of a high dam located above an area of population, the breaching of a levee, the collapse of a bridge carrying rush hour traffic are likely to result in damage to property and loss of life at levels orders of magnitude higher. Yes, the engineer in contrast to the scientist is usually in the fortunate position of dealing with processes that have been thoroughly researched within other contexts but

the design itself will generally be unique and the ways in which all these processes come together to control the behaviour will be different for each system. All of this places demands on engineers to be able to anticipate how a system might respond, and be able to develop models of this response, well in advance of the existence of that system.

These demands become most pronounced when major innovations are introduced into design, or when existing technologies are extrapolated to allow daring new lengths, spans, heights, slenderness or types of material. Bridge engineering is instructive in this regard. It is normally the case that an innovation is accompanied by a major research effort to validate what might be a fairly radical change in design directions. As steels with higher tensile capacities became available so it became possible to construct increasingly long suspension bridges. This was certainly the case with the growth of suspension bridge spans over the first few decades of the 20th century. With the completion in 1937 of the Golden Gate Bridge in San Francisco, which had a record-breaking clear central span of 4200 feet, it appeared that the rapid growth in clear spans over the previous few decades had reached its peak. In what might have been regarded as a fairly minor innovation (that of replacing the open form of web for the stiffening girder with solid I-beams) there seemed no strong reason why the design of the shorter clear span (2800 ft) Tacoma Narrows bridge should not be undertaken in accordance with what were then fairly well established international design approaches. However, with this seeming innocuous change in web design and some changes in the torsional characteristics of the stiffening girder, came major and unexpected changes in overall behaviour. Even before the bridge



The death throes of the Tacoma Narrows suspension bridge, November, 1940



was completed it became apparent at moderate wind speeds that the bridge was developing an unusually high dynamic response. Many working on the bridge suffered from a form of 'sea sickness' induced by the large dynamic motions. After opening to traffic, locals would spend Sundays driving back and forth over the bridge, to experience sensations easily the equal of fairground attractions, with the bridge eventually attracting the nick name of 'Galloping Gertie'. Needless to say the bridge was unable to sustain such disastrous and unanticipated motions and, some 4 months after its opening, it collapsed dramatically into Puget Sound. While there had been earlier incidents that should have alerted bridge engineers to the need to consider aero-elastic interactions, the failure of the Tacoma Narrows Bridge has most certainly had a profound effect upon subsequent long span bridge design. Here then is a case where what might have appeared small innovations in the design produced changes in behaviour that were not anticipated by the designers; a case where not all the possible failure modes had been properly taken into account. Fortunately, apart from a dog that had been left in the photographers car parked out in mid-span, there was no loss of life.

For somewhat different reasons the innovative design aspects embodied in London's Millennium Bridge suffered a very similar fate. Here the reason for innovation was visual rather than structural. Being

more concerned with appearance, and especially the need to be different, this suspension footbridge was conceived (by an architect, it should be added) to resemble a 'blade of light' crossing the Thames. This was achieved by adopting a sag of the suspension cable that as a ratio of their span is about one quarter of that adopted in more economically engineered designs. As a consequence the forces developed are very much greater and the high construction costs a reflection of this mechanical inefficiency. But the real problem was caused by the extrapolation of the design parameters to an extent that they no longer fell within those covered by generally accepted design practice. It was a feat of considerable significance that the designers were able to retrospectively add damping systems that have now largely eliminated the problem experienced on the opening day.

Here then are two examples from bridge engineering of the consequences of not conceptualising at the design stage all the potential forms of failure that could be exhibited by engineered systems. They and endless others like them, show how engineering designers must have an ability to visualise in the abstract all the potential forms of failure of their systems if they are to avoid failures once the system becomes a concrete reality.

So do I feel comfortable predicting what might be the thermal-mechanical origins of stone circles when I

## HOW ARE THEY FORMED?

Periglacial geomorphologists have a plethora of possible explanations for circles like those shown in the figure. The most widely accepted explanation could be thought of as a form of mini plate-tectonic model. In this model soil convection cells, driven by density differences caused by temperature and moisture inhomogenities, are believed to induce an up-welling near the centres of the circles driving the moist soil upward and outward. Outward motions are limited by a form of soil subduction beneath the stone ramparts at the boundaries. Surface stones are skimmed-off to form the characteristic ramparts above the subducting soil. The convective cells are envisaged to have the shape of a distorted toroid – or doughnut. A major problem with this model is that the small differences in density appear to be inadequate to mobilise the forces needed to shove soil and stones out to form the border ramparts.

My own theory of how these periglacial features might have developed is based upon what happens to the surface frozen ground when subject to cycles of warming and cooling: a small stone-free area of frozen soil will want to expand outwards when warmed. Whether it be cycles of diurnal warming and cooling or longer term, such as seasonal changes, the warming phase will be accompanied by the development of large outward compressive stresses – sufficient even with moderate increases in temperature to dislodge and move outward potentially large stones. Ice and frozen ground are weak in tension and will, upon subsequent cooling, crack at even a moderate drop in temperature. Moisture and frost getting into the cracks will freeze preventing the previous outward deformations from being fully recovered. As a result, each cycle of temperature warming and cooling beyond a critical threshold will cause the border stones to be pushed out a little further. It will be the most extreme of such thermal cycles that govern the greatest outward shoving forces and consequently the characteristic diameters of the stone circles.

have never actually seen them let alone stood on them? Well, yes. After all, if the model is wrong my little paper advancing a new hypothesis will just quietly slide into oblivion like so many other scientific publications – quite a different outcome from a failure to correctly model major engineering systems.

I have now heard from the editor of the international journal to which the article was originally submitted. Not unexpectedly it has been rejected. Interestingly, many of the reviewers' comments were in the form of questions to me, so that it is therefore even more frustrating, since there is no mechanism within much of modern publishing practice to challenge incorrect referee comments, not to be given the chance of continuing what could be a helpful dialogue for all concerned. Of course I do not propose throwing in the towel. But whether I make any progress with this particular journal is uncertain. Originality it seems comes at considerable cost.

*James Croll is Professor of Civil Engineering at UCL and has taught and practiced structural engineering for more than 40 years*



The Ibyuk pingo in Canada: another structure formed by the mechanics of ice in a permafrost environment



A pingo in Svalbard, photo Hanne Christiansen

## Sustainable Cities

In the previous issue we announced a graduate writing competition in memory of Craig Patterson, founder of UCL Grand Challenges. The winner of the competition and a £250 prize from the Grand Challenges scheme was [Olivia Hamlyn](#) of UCL Laws. The entire range of entries to the competition is published in an electronic anthology, available on the *Sophia* website: [www.sophiamagazine.co.uk](http://www.sophiamagazine.co.uk).

## THE CITIES

EVERYONE SHOULD VISIT ATHANASIA. The healthy city. The Immortal city. As you approach, you catch glimpses of it through the thick, surrounding forest. At first, you are not quite sure whether it is a city at all, so perfectly does it blend into the trees, living with them as part of the forest. Athanasia is a city with a light footprint and faint presence. The delicacy of its structures suggests that it is always almost on the point of dissolving. If it did dissolve one day, the forest would grow up again through the city, unhindered by relics of the last dwellers, and the wildlife would re-colonise. If you were to return a few years later, you would find no evidence of previous human existence, only an area where the trees are younger.

Athanasia's strength and endurance lie in its character. It balances itself and its needs against the shape and the needs of the countryside it inhabits. It allows itself to be moulded by the natural structures of the seasons and surroundings.

Athanasia has an unhealthy, sister city. If, turning away from Athanasia, you walk for five or six days through the forest until it fades into deforested stubble-plains and from there into vast agricultural fields, you will see a hard, geometric shape forcing its way through the horizon. Walk closer and the natural surface of the earth runs out, being replaced with cracked concrete and roads twisting through the landscape from every direction, piercing the boundaries of the city. If you are lucky enough to find a footpath into the city, take it, but beware of the potholes and plants struggling out towards the sky. Very few citizens of the unhealthy city walk, and certainly do not walk out of the city, for they see no need to view or understand their surroundings. So the

footpaths are not maintained, but left as disintegrating evidence of a sense that became extinct.

From afar, the unhealthy city looks indestructible and in a sense it is. Its buildings were built to be strong; made from concrete, reinforced with iron and steel, intended to withstand and fend off every onslaught of all parts of the world that are 'other' than the city. The unhealthy city would not dissolve like its sister, but it will crumble, slowly and reluctantly. The brickwork will break and crash to the ground, leaving the metal reinforcements bent and skeletal but standing defiant. The dust from the crumbling will hang over the ruins for centuries, or else be blown across the fields where it will settle, suffocating what life remains. The mark left by the unhealthy city will be permanent and although nature will eventually creep back, it will not be capable of eradicating the city's historic footprint.

## IN THE CITIES

The best way to reach Athanasia is to follow a stream. When you walk alongside the stream, you notice three things. Firstly, that the stream is deep, secondly that you can see right to the bottom and thirdly that it is full of life. As the stream leads you into Athanasia, you realise that the trees are gradually thinning and making way for buildings; both houses and then buildings of state and for work. The streets are still leafy and the air quality as clear and as sweet as it had been in the middle of the forest.

Athanasia wasn't planned or designed. Rather it grew into its surroundings, with the streets filtering through the wood, curving where necessary to take account of contours and using only as much room as the land could accommodate. The neighbourhoods are not just communities of people, but of all things

that live, and all live together in recognition of their mutual dependence. Each neighbourhood has its own character and knows no mirror-image neighbourhoods elsewhere in the city. The shops are unique, local and independent. Advertising is done primarily by word of mouth and large billboards displaying the temptations of a different reality are absent.

In the centre you find reflections of the city's surrounding countryside, with its large, wooded park. The stream you follow in leads all the way into a natural lake in the centre of the park. Do not misunderstand me, the city is not an untouched wilderness, nor is it sterile through excessive cleanliness. The centre is busy, like any city, bustling with shoppers, tourists, professionals, artists, street performers and school children on daytrips. The paths the citizens take in their daily movements weave in and out of one another, invisibly binding the city together. It is well lived in, as any city should be, and therefore familiar with dirt. But the dirt is simply the result of activities no more harmless than living and ordinary use. The living happens within the capacity of the city to absorb the residue and of the rain to wash it away to where it harmlessly disintegrates.

The first thing you notice when approaching the unhealthy city is the noise. The roar of the 6-lane highways that lead into the city, or the chorus of car horns stuck in jams on the roads. The noise intensifies as it bounces off the hard surfaces of streets and walls. The air becomes heavier and thicker the closer you get. It hovers, trapped between the buildings. This is a city built on burning: it burns to travel, to work, to construct, to entertain and to feed itself. Its buildings are black from smoke and this informs the dark humour of its inhabitants. It is the grime that holds the city up; if it were cleaned, it might collapse, they joke.

Uniformity is what characterises the public spaces of the unhealthy city. The streets are laid in a perfect grid pattern, with the same shop on every corner and the same pattern of facades along every pavement. There is little to choose between the different districts, which are all the same district. The business owners even learnt how to clone cafes decades ago as a generous gift of predictability and no surprises for their consumers. The consumers in turn, stupefied by Same, trace their usual routes in fragmented oblivion.

#### LIVING

If you were to meet an Athanasian and ask him what the city does with its waste, he would look at you blankly.

Waste as a concept died out generations ago and only the word remains, ancient and meaningless. The Athanasians see the arrangement and rearrangement of molecules into different objects for use at home or at work as a cycle without beginning or end. When the time comes for the molecules to pass out of human use, the Athanasians ensure that they can be reabsorbed into nature with the minimum threat to its resilience.

The Athanasians consume only what they need and their need is based on what the natural systems on which they rely can provide and continue to provide. Thus, life in the city thrives on a principle of reasonable austerity. Not because the resources to provide the citizens with more do not exist, nor because they cannot afford to acquire more but because excess is accepted as unnecessary. All possessions and equipment are treated as worth keeping and restoring forever, or until they are given a different function.

There is no need, in the unhealthy city, to enquire what it does with its waste, as it is obvious. On your journey into the city, you see mountains of rubbish, growing out of huge pits. The mountains are composed of every kind of discarded good: industrial, commercial, household, clothing, some of it barely used but all of it cheap and obsolete. At the heart of the culture is a paradox that places great value on material possessions but denies the attachment of value to any particular object such that the owner wishes to keep and maintain it. Rather, an obsession with the linear ritualism of acquiring modern and discarding outmoded prevails.

For this reason, the unhealthy city exists heavily upon the Earth. It devours all stores of nature ignorant of capacity or limits, blind to the need for maintenance and restoration. Exhaustion in two or three generations' time is no reason to quench its voracious appetite and so it eats more and more into its resources, deceived by the appearance of abundance.

#### ENERGY

I explained to you before that Athanasia's endurance lies in the lightness of its existence, but it also originates in a restrained use of energy. Like someone taking a stroll, it never exhausts its reserves but conserves them by leaving space for restoration and replenishment. It can thus continue strolling indefinitely.

The unhealthy city, by comparison, sprints. It draws constantly upon its reserves, attempting to distribute energy to each part of its heavy load while creaking

under the combined weight. It knows such speed cannot be maintained but its current insatiable hunger makes it too difficult to stop. It will only stop when forced to, starved of fuel, sinking breathless and shattered to its knees.

#### ORIGIN

You may wonder how a city such as Athanasia came to be. Perhaps you are imagining that centuries ago a wise lawgiver laid down how the Athanasians should live. Or, if you are practical, you may think that the citizens' behaviour is shaped and constrained by strict regulations. Actually, neither is true and in fact no one knows the origin for sure. Some say that the city was founded by refugees from the unhealthy city who brought with them the ideal of living the opposite life. Others believe that the city has always existed and that the invisible principles and network of laws governing its structures and way of life were gradually shaped by the environment which it inhabits.

The question does not cause the Athanasians much trouble beyond intellectual debate and interest. The truth is that, to a greater or lesser degree, they hold the same principles and live with a proper respect for the life systems of which they are a part.

My theory of the origin is that at some point in its history, the city underwent something you could call a natural revolution. This took the form, primarily, of a change of consciousness. The citizens realised that as humans, they need not place themselves outside or above nature but instead that they belonged within the natural systems and were as dependent on them as any other life form. They also saw that it was not their right to impose laws on the world, but rather that laws grew on trees. They understood that these laws should be observed, since it made no sense to argue the importance of something else with the unreasoning, unconscious force of nature.

Within the collective consciousness of Athanasia, the idea of stewardship developed. Current generations have a duty look after their natural heritage to pass on to succeeding generations. This idea is held so strongly in the minds and consciences of all Athanasians that sometimes you swear that the streets glimmer with those who will inherit next. The city formalised this by appointing to public office a citizen whose responsibility it is to ensure that the rights of future generations are respected.

All action to achieve this is based on certain principles derived from reading nature and understanding its laws. There are people whose full-time job it is to discover and interpret these laws. It is an intense scientific process. The discoveries are reported back to the political representatives and lawyers who translate them into language understandable by humans. Many of the laws are highly technical but there are some broad principles that you and I can comprehend.

The first is a duty not to exploit nature's resources beyond their own capacity to regenerate. Fish stocks, for example, are monitored and if the population is low, there is no fishing until it has recovered. It recognises the fact that there are limits to the burden humans can place on nature to meet their requirements, and if humans want to continue eating fish, they must respect those limits. Secondly, there is a duty to share fairly nature's assets both between humans and other members of the natural system, so that no part is deprived of what it depends on to exist. This is the recognition that human needs do not outweigh the needs of other parts of the natural system. The intrinsic value of non-human life is understood and respected by all the human dwellers of the city. Thirdly, it is understood that sometimes, human input is needed to maintain and manage natural resources. There is no ban on human intervention or use of resources as it is recognised that humans carry an instinct to develop, progress and improve. However, this is done sensitively and bearing in mind the other principles.

Should any of these principles be breached or the laws broken, it is not just humans who can bring a claim. The part, or parts, of nature that have been damaged may be represented in court. If the defendant is found guilty, he is not punished with a fine, or imprisonment, for these represent no compensation to the damaged party or those who depend on it. Instead, remedies are based on the principle of restorative justice which provides that the damage is repaired and places on the wrongdoer a duty to tend to that part of nature until recovery is complete.

When you have seen both cities, you understand the difference these principles make. A citizen of the unhealthy city would be as puzzled by them as an Athanasian is by the concept of waste. The unhealthy city is concerned only with the current needs of humans and these override all other considerations.

Everyone should visit Athanasia. The eternal city. The city that does not exist.