

# sophia

Issue 3

June 2009



Tales from the folk bible  
The impact of tsunamis  
Why did altruism evolve?  
Dreams and the cinema

*Sophia* Issue 3

This issue printed June 2009

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Typeset in Arno Pro and Caecilia LT

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## PHOTOS



*Cover image:* The pair of images is derived from a series of photographs exploring the placement of my body onto one of my sculptures. By capturing this recontextualisation I aim to focus on the dialogue between 'object' and 'creator'; a complex relationship that does not entirely abstract my body nor anthropomorphise the sculpture but meets somewhere between the two.

Ryan Riddington , MFA student, Slade School of Fine Art

# Editorial

THE STRUCTURE OF MODERN RESEARCH is like the Eiffel Tower. This intriguing image was cited in the inaugural lecture of newly installed Professor Hasok Chang of the Department of Science and Technology Studies. Although Eiffel's engineering wonder might seem something to aspire to, Professor Chang pointed out what it had at the bottom: a gaping hole. While the pinnacles of modern academia rest on purportedly sturdy legs, is the broad base from which it grew forgotten because it was wrong or simply because it was mislaid? Chang also evoked a time when the public played a more participatory role in research in the pages of an early 19th-century journal: William Nicholson's *Journal of Natural Philosophy, Chemistry and the Arts*. Compared with the austerity of later, peer-reviewed journals, Nicholson's featured broad and lively debate on observations sent in by amateur experimentalists across a wide range of fields. This pluralism is what (visibly) excites Chang and it may be no coincidence that the first plans for *Sophia* began shortly after I took part in his Philosophy of Science workshop series.

Cultural evolution is a field in which this dichotomy between precise method and intuitive understanding can be at odds. Although large data sets and statistical tools are our surest way to test hypotheses, the collection of the data must be done with care and sensitivity. In this issue, John Hardy discusses the evolutionary origins of altruism with Ruth Mace and Anna Barros wonders what kind of evolutionary argument could explain rape. In addition, the need for cultural insight in anthropological study is expertly taken up by Florentina Badalanova Geller and Ambika Aiyadurai.

Finally, in cooperation with UCL's Grand Challenges scheme, *Sophia* is delighted to be running a writing competition on the theme of 'Sustainable Cities'. Please see page 35 for the details.

“The twisting paths of our footsteps have given shape to the City's spaces, weaving together disparate places in an urban narrative. Taking part in this walking tour we have become practitioners of the City”

Karolina Kendall-Bush  
p. 31

*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:

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*Sophia* is seeking a candidate to take over the role of designer for the next issue. You should have experience using Adobe InDesign and some examples of your previous work. Please contact the editor if interested.

## THE KINDLY ONES

American/French writer Jonathan Littell's debut novel, *The Kindly Ones*, written in 2006 and winner of the prestigious French literary prize *Prix Goncourt*, is the fictional memoir of Max Aue, a Nazi SS officer who, having escaped justice after the war, is wholly unrepentant for his role in the Holocaust. At over 900 pages and divided into only seven chapters, *The Kindly Ones* is an unrelenting and often oppressive read, reflecting the complexity of its subject and brilliantly fulfilling Littell's ambition to draw the reader into the dark world of the perpetrator.

No event is spared from Aue's account of his life as an SS officer: from his conversations with Himmler in Berlin to crude reports of his bowel movements while serving in Stalingrad. Within the texture of this dense description, the well-educated Aue attempts an intellectual rationalisation of his crimes. He grasps at various ethical philosophies to explain his actions, but never quite shakes the feeling of having transgressed into evil. For all his cool-headed detachment, Aue is literally sick at the thought of his crimes, suffering from vomiting, nightmares and mental breakdown after acting in the mass murder of Jews in the Ukraine. Sharing Aue's perspective, the reader is left unsettled by the narrative's oppressive weight and its conflicting, unsatisfactory justifications for genocide.

Littell's novel is an exceptional exploration of the concept of personal responsibility in an era of total war and state-sponsored genocide. Littell has been criticised for his protagon-

ist's sexuality (Aue has an incestuous relationship with his twin sister) and private crimes (it is strongly implied that Aue murders his mother and step father), as if these particularities preclude Aue from being a character the reader can identify with. But it is precisely this characterisation of a man capable of evil but not entirely monstrous that Littell puts forward as his image of the Holocaust perpetrator: a human being who is neither a state-controlled automaton nor an inhuman monster. Without the slightest glimmer of a cathartic resolution, *The Kindly Ones* demands that we discard the abstract notion of inhumanity and examine evil as a human phenomenon with complex, real-life causes. As Aue tells the reader at the beginning of the novel 'you'll see that this concerns you', and one cannot help but take Littell's hint that, for all the uniqueness of the Holocaust, our human capacity to do evil unto others is still at play today.

Ronan McFadden

## DARWIN AT DOWN

As part of the intense Darwin 200 programme to celebrate the bicentenary of Charles Darwin's birth, the Horniman Museum in Forest Hill is displaying a series of photographs of Darwin and his family taken at their house in Downe, Kent. The exhibition, which will be on until June 7, includes nine family portraits kept by Darwin's wife Emma in her album, a picture of Darwin taken in 1880, and six photographs of Down House.

At Down House Darwin wrote some of his breakthrough texts, such

as *On the Origin of Species* in 1859. In this house and in its surrounding areas – this year's UK World Heritage Site nomination – Darwin also carried out most of his experiments and observations. Today a national icon and a fascinating museum, almost two centuries ago the house in Downe was first and foremost a home. In this house, which he bought in 1849, Darwin lived with his wife and seven children and died in 1882.

The captions accompanying the pictures at the exhibition emphasise how Darwin's interest in nature had a great influence on his family. Even his wife's much-loved piano became the perfect place for experiments: on this instrument Darwin placed a jar of worms to monitor their reaction to music. With a father so dedicated to the observation of nature and scientific research, it is not surprising that some of Darwin's children followed in his footsteps: Francis became Professor of Botany at Cambridge; Horace founded the Cambridge Scientific Instrument Company; George became Professor of Astronomy and Experimental Philosophy at Cambridge; Henrietta Emma edited her father's manuscript of *The Descent of Man*. The other children achieved notoriety in their own field, but still benefited from their father's support. William Erasmus decided for instance to be a banker and received his starting capital from Darwin himself.

Like many parents today, Darwin wanted to give his son William Erasmus a meaningful present for his eighteenth birthday: he therefore treated him to a camera, the same camera with which the family portraits on display were taken. Draw-

ing inspiration from this episode, the Horniman Museum, in cooperation with the Grant Museum of Zoology at UCL and the Institute of Biology, encourages the public to step into William Erasmus' shoes and use a camera. A photographic competition open until October 2009 challenges whoever interested to send in pictures showing the same willingness to explore and investigate nature that drove Darwin first and some of his children later.

*Elettra Carbone*

#### DEVELOPMENT IS THE BEST CONTRACEPTIVE – OR IS IT?

Global catastrophe scare stories progress in fashions. Back in the 60s the population boom was a concern treated seriously by politicians and academics alike. Since then our awareness has shifted onto nuclear holocaust, the Aids epidemic and most recently climate change. This change in perception has diverted attention and, more importantly, funding away from family planning initiatives in both developed and developing countries and, although it is a subject many wish to avoid, population growth is a current and future catastrophe which impacts on global health and sustainability.

This message was eloquently and convincingly presented by Professor Malcolm Potts of the Birkby Center at UC Berkeley (and formerly the first male doctor at the Marie Stopes Clinic in London) at a symposium hosted by UCL's Institute for Global Health entitled 'Straight Talking: Population growth and family planning'.

Two axioms ingrained in the minds of many economists and politicians are that population growth slows automatically as a result of

economic development and that poorer members of society *choose* to have larger families to maximise the chances of their offspring surviving; only when a family is relatively comfortable will they switch their strategy to have fewer children and invest more resources in each individually. While this may have some truth to it, Potts showed that interviews with mothers across the social spectrum revealed that poorer mothers did not want many more children than richer mothers. The factor that *did* make a difference was their access to effective family planning: accurate medical advice, contraception and safe abortions. Figures contrasting population dynamics in Thailand with those in the Philippines showed a clear picture: the fertility rate in Thailand quickly dropped after cheap, locally run family planning measures were put in place whereas it continues to climb in the Philippines – a country where the Catholic religion is at odds with the efforts of government health initiatives.

This interplay of cultural factors with the more concrete issue of access to family planning resources was enthusiastically discussed by a panel including UCL Professors Ruth Mace and Judith Stephenson, and Karen Newman of the Population and Sustainability Network. For success, the panel agreed that cultural sensitivity was key: shiny medical buildings springing up in the middle of dusty townships are intimidating and many societies fear doctors and hospitals as entities that you only come across if you are dying. The Thai programme was most successful after encouraging shopkeepers on floating markets to sell contraceptives, and an Indian doctor performed a record number of vasectomies after setting up shop on Platform 9 of Mumbai railway sta-

tion. Religious leaders, while often ultra pro-natalist, can help to encourage sustainable population growth: a state-sponsored programme of contraception provision accompanied by advice given in mosques to newlyweds led to Iran's birth rate dropping even faster than China's during the one-child policy.

Uncontrolled birth rates have an immediate effect on global health. Current global maternal mortality occurs at a scale equivalent to a jumbo jet crashing every six hours. So why the reluctance to address this issue? The panel agreed that in the context of global health, family planning just wasn't sexy compared to, say, programmes distributing antiretrovirals. The fact that it is relatively cheap to train locals to distribute contraception means that it is overlooked by governments and medical groups who want to invest in cutting-edge multi-billion dollar interventions.

'This evening we have a nice uncontroversial topic', joked the chair, Professor Anthony Costello, at the start. By the end, though, the panelists and audience seemed in broad agreement. Where controversy lies is with politicians and development agencies who often treat this subject as taboo. Potts ended by passing responsibility to the audience to make this an issue that is treated with the urgency that is required by lobbying MPs to add family planning to the global health agenda.

*Ed Long*

#### BUILDING NEW LEARNING COMMUNITIES

Global Citizenship is UCL's latest challenge. It is a pioneering programme aiming to form critical and creative students open to diversity

and innovation and ready to face the social and cultural challenges posed by the 'global' world.

As a key partner in the Global Citizenship initiatives, the Department of Science and Technology Studies (STS) coordinates a new programme for students from overseas universities, and offers a set of courses designed especially for the programme. The courses are also open to current BSc students and include: Science and Global Citizenship; Technology and Global Citizenship; Science, Communication and the Global Community; and Action for Global Citizenship.

On Wednesday March 25, the nine BSc students in the pilot group for the Action for Global Citizenship course presented a project entitled 'Building New Learning Communities' at the Garwood Lecture Theatre. The project was supervised by Dr Jane Gregory of STS.

Students chose to conduct a series of interviews addressing the relation between citizenship and universities, with a specific focus on learning disabilities. A film with extracts of the interviews – which involved UCL students as well as people with learning disabilities – was showcased in the course of the event on March 25. This was accompanied by a presentation of students' critical reflections on the significance of the project, their findings and their policy recommendations.

The project elicited stimulating questions from the audience. Students presented a sophisticated assessment of the concept of citizenship emerging from different experiences of learning that UCL students and people with learning disabilities reported in the interviews. They inquired into the role that UCL, with its commitment to diversity and

integration, can play in promoting equal opportunities on a local level and wondered whether it was time for 'London's global university' to become 'London's local university'.

Action for Global Citizenship is an action-based course, in which students are encouraged to 'change the world'. In this, the Action for Global Citizenship Group was most successful. The enthusiasm and commitment that animated students in undertaking the project resulted in an event of outstanding academic quality, which will certainly leave a legacy at UCL and hopefully become a yearly appointment for academics and members of the public interested in global issues.

*Chiara Ambrosio*

#### TOWARDS CUSTOMISED, WHILE-YOU-WAIT TISSUE FABRICATION

Stem cells can theoretically generate any tissue we desire, but 'tissue farming' has proved a laborious and troublesome process and one which is far from practical. Professor Robert Brown of UCL Orthopaedics and Musculosk Sciences suggests that it may be because we may be going about it the wrong way.

One existing approach involves culturing cells in a bioreactor 'scaffold' which shapes the structure of the forming tissue as it grows (sometimes for months) until it is ready for use in surgery. However this is not just a problem of time consumption; recent experiments have showed tissue cultured in this way contains very little of the structural protein collagen compared with the real tissue it is supposed to replace. Collagen accounts for a quarter of the human body's dry mass and the way in which it is arranged determines the 3D archi-

ture of the tissue. A poor replacement could just lead to scar tissue.

To tackle this problem of 'bulk', Brown's team uses animal collagen as a substitute, which is already safely used in a variety of medical applications from abating haemorrhage to plumping up those lips. Firstly a gel mould is made from the collagen and the desired cells. This is then sandwiched between filters to drain excess water and compact it. Multiple layers of these gels containing various cell types can then be constructed to form a tissue: soft tissue flanked at the side with bone-forming tissue and then rolled up (and looking very much like a cotton bud) actually yields a very biomimetic ligament. The team has also integrated soluble glass tubes through their fabricated tissue, which once dissolved eight hours later, leave behind channels which will increase oxygenation to the tissue or serve as networks to insert blood vessels.

This process takes hours, versus the months needed for classical tissue culture and the group envisage a 'while-you-wait' tissue fabrication system. To this point Brown and an assistant unveiled the prototype, complete with Lego robots and a conveyer belt. At one end a cooled collagen/cell mix is pumped into a mould, which solidifies slightly as it passes down the conveyer, being compressed and separated from filters en route before being dispensed to the 'waiting surgeon'. The computer can be programmed to tailor the gels in the event the surgeon may require, for example, thinner skin for an eye lid or thicker skin for the thigh.

So, it is suggested, rather than focusing all the effort on the scaffolding, check the foundation is intact first. It could save a lot of time.

*Stephen Griffiths*



# The Folk Bible

God taught people everything ... Granddad Adam and Granny Eve came together, God made them do it ... They didn't know how to make love and so God taught them...

God threw a flame at [Adam] and it hit him in the bottom and he got even closer to Granny Eve and they came together. And all the people started from there ... He threw this coal and that was it...

What is the relationship between the written text of the Bible and its oral sibling, the folk Bible? On the basis of over 30 years of field research on vernacular religion in Eastern Europe, **Florentina Badalanova Geller** is about to publish a three-volume monograph, *The Folk Bible*, addressing this question. Here she presents the main issues and some preliminary results of her project on the description of popular dimensions of Christianity, and of Holy Writ in particular.

**T**HE VERNACULAR ORAL COUNTERPARTS of Holy Writ are phenomena conventionally excluded from the scope of biblical scholarship. Even if taken into consideration, they are treated with extreme caution and often trigger resistance among both theologians and specialists in religious studies, who tend to interpret them as a deviation from the canonical written text.

Although it is generally admitted that the *canonical* written text of the Bible emerged from a certain undefined oral culture, evidence from ‘living’ contemporary folk traditions is rarely taken into account in modern scholarship. Extra-canonical, vernacular renditions of Holy Writ (unless extracted from prestigious written sources, or hypothetically reconstructed on the basis of such sources) are rarely accepted as reliable and worthy evidence, although they can reveal various stages in the process of the emergence and development of the canonical text.

A break with this long-dominant scholarly tradition is needed. A new discipline – the *ethno-hermeneutics* of religions of the Book – is emerging. It offers an innovative approach to scriptures such as the Bible or Koran, suitable for the re-evaluation of the hitherto underestimated oral material. While ethno-hermeneutics in general focuses on the study of the interpretation of texts within specific ethno-cultural contexts, the implementation of this discipline in studies of Abrahamic religions – Judaism, Christianity and Islam – puts the emphasis on their vernacular perception, colloquial interpretation and transmission by word of mouth. What I would like to demonstrate with my research is that vernacular versions of the Bible not only show an intricate connection between the written Judeo-Christian canon and local folklore systems, but also represent the unfolding of a certain primary oral entity; the earliest existence of this primordial verbal corpus – which can be termed the *Ur-hypertext* – preceded the actual formation of the Biblical text itself.

In fact, the Bible represents only one among many of the subsequent metamorphoses of the original oral proto-text, traces of which can be found in later Judaic tradition in Midrash and Aggadah; in Christian tradition in a number of apocryphal texts, as well as in early Christian writings; and in Islamic tradition in the Koran and Hadith. Moreover, these written offspring of the ancestral oral proto-narrative have their modern folklore counterparts, which have been circulating ever since as tales, chants and songs in the Middle East, the Mediterranean

region and Southern and Eastern Europe. In fact, these clandestine oral twins of Holy Scriptures never ceased to exist in vernacular traditions of Judaism, Christianity and Islam.

In my view, the proto-Biblical oral corpus provided the framework and created the intellectual landscape from which the written body of the Bible eventually sprang. Not only did this body of oral texts foster and nourish the corpus of texts which later formed the Holy Scriptures, it also survived to the present day in folk culture of many religious communities, as clusters of verbal, iconographic and ritual texts constituting the framework of their belief systems. Slavonic popular tradition represents one such case, and some medieval Slavonic versions of apocryphal Old Testament texts, the first written versions of which – in either Hebrew or Aramaic – can be traced back as early as the 2nd–1st century BCE, parallel recently recorded oral texts. The fabric of these folklore narratives demonstrates that a cultural continuity has existed among both men of letters and illiterate believers for centuries; in this, the oral and the written modes of knowledge transmission, together with that of the visual arts (iconography), put forward many facets of the original oral corpus of the biblical Ur-hypertext.

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*I was arrested twice in the former USSR for asking the simple question, ‘how did the Lord create the world?’*

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Indigenous folklore texts also show how the ‘language’ of icon-painting relates to the language of storytelling, chanting, and singing, since verbal and iconic texts were perceived by illiterate Christians as two interdependent manifestations of the ‘Divine Word’. This same idea can be found in the words of John Damascene (8th century):

‘Icons are for unlearned people what books are for those who know how to read; they are to the eye what speech is to the ear.’

In all medieval Slavic communities, whether under the political influence of the Byzantine Empire or under that of the Latin West, Christianity was the sole religion of the Book. The act of writing and reading acquired the status of a sacred undertaking. At the same time, for the unlettered peasantry, it was not only the written but the

oral text as well that was considered to be 'the emanation of God Almighty'. Orality was considered holy and therefore storytelling and singing were regarded as a sacred performance; in many cases, they acted as vernacular ritual counterparts to the Liturgy. In other words, if for the upper levels of society, Christianity was considered to be *the* religion of the Book (and writing and reading were regarded as a holy deed), likewise for 'simple folk' storytelling and singing functioned as sacred ritual activities.



Together with the written text of the Bible, another Bible existed among the peasant communities in Eastern Europe: a *folk Bible*, which was orally transmitted among the illiterate believers, and which changed its appearance at every new performance. Unlike its written counterpart, this unwritten Holy Writ was extant in many oral versions. Some of them were first registered during the 19th century and published in a number of ethnographic and folklore collections. The results of recent anthropological field research in the Eastern Europe indicate that traces of these texts can still be found in the Slavonic folklore tradition and many new versions may still be encountered. These may either relate to the canonical or apocryphal accounts of the Bible, or offer renderings alternative to them, thereby revealing a new cluster of folklore texts related to Holy Scriptures. They, in turn, present a picture of the folk Bible, which appears to be elaborate and complex. Analysis of the materials collected indicates that the folk Bible never offers a word-for-word reproduction of any of the canonical scriptural stories. Rather it puts forward a specific frame of reference in which the local system of religious beliefs, together with some universal cultural concepts, is incorporated.

Often narrators compress and abbreviate the biblical text, condensing and putting together various fragments of Holy Writ (in either their canonical or apocryphal versions) into a single tale which varies at any new performance. The Bible is thereby not only story-told and sung; it is lived and experienced as a collective narrative anchoring a community's existence.

Besides making use of archive materials and of some previously published accounts from rare ethnographic and folklore periodicals from the 19th and early 20th centuries, a project that attempts to document and analyse the oral folk Bible tradition requires extensive fieldwork. There were and still are major obstacles to this kind of research. Needless to say, one must be able to speak the local dialects fluently and a bond of trust must be established between the informant and researcher, in order to ensure accurate information is being given. This was particularly difficult under communism, when dissemination of religious knowledge was a criminal offence. I was arrested twice in the former USSR by asking the simple question, 'how did the Lord create the world?' On the other hand, it would be impossible today to reproduce this kind of fieldwork because of globalisation and modern communications. In addition, the last generation of those preserving this kind of knowledge is now mostly gone. The younger generation follows different patterns of religiosity.

Stories about the Creation and Flood were among the most popular of folk narratives concerning Genesis. During research trips in Bulgarian villages I have been able to record different variations on this particular theme. In November 1989 Dimitar Filipov Ivanov, a man from the village of Kotevovtsi, in the Berkovitsa area, North-Western Bulgaria, who was born in 1920 and had completed only one year of secondary education, told me his version of the legend of the biblical Flood. According to his story, Noah the cooper was told by God to build a barrel rather than an Ark, where he, his family and all the animals were to live while the Flood covered the Earth for years instead of days:

'When the Flood took place there was a cooper. God gave him a sign. He was told, "You will make a big barrel. The land will be flooded soon and there will be water everywhere. You will make a big barrel!" ... [And God said,] "Gather all the animals on earth in this barrel! Gather all the animals in the land!" ... Then he [Noah] realised that the great Flood was coming. The

water was coming! ... As he had been told from above! God Himself had told him ... And he and his family got in the barrel ... He closed it and the barrel floated on the waters while everything else was swamped! ... Everything was covered in water ... The whole of Europe was like that – valleys and mountains, fields and hills ... Only God knows how many years passed. There was enough food in the barrel, as he [Noah] had taken everything they needed. I don't know how many years passed, twelve or thirteen ... Many years ... At last they landed. There was land. The barrel came to rest.'

Over the many years of my field research I kept encountering the same type of narrative over and over again, in different villages. As a rule, the storytellers insisted that the Flood had taken place in their own vicinity; some even showed me the place where Noah's Ark was believed to have landed. Furthermore in some cases the biblical Patriarch was given a typical local (Bulgarian) name, thus 'becoming' an honorary ancestor of the village in which the Flood story was narrated. In the account of another storyteller whom I met about two years later in the same region of Bulgaria, Zonka Ivanova Mikhova (a peasant woman born in 1909), the biblical legend of Noah and the Flood becomes an etiological story that explains the origins of Bulgarians. In her version Noah, once on land, planted a shoot, which a bird from the Ark had brought back to him, and grapes started to grow from it:

'And the grapevine had grapes but they were still green, it wasn't yet ripe. He ate from it and said: "No, you can't eat that!" And when they were ripe, he pressed them and drank wine from them. And he drank and drank, and had more than enough, and got drunk and lay down to sleep. He had taken his clothes off as well. And one of his sons came, and said: "Look! My father is naked!" And the other said: "Forget about him! It's well deserved – he was so greedy he drank himself to death!" And he woke up and said that he who said that his father should sleep, he will be blessed. Wherever he goes, he will be happy. He who said that his father was naked, he will roam and roam, and never find peace to settle! He will have nothing! [...] And the one who obeyed his father, he was the forefather of the Bulgarians.'

The above tale also shows how the folk Bible accommodated indigenous ethnohistory. Some Russian religious songs present the same concept.

The results of the last thirty years of my research are soon to be published in a monograph – *The Folk Bible* – in three volumes focusing respectively on the actual folklore texts in their original language; their English translations; and an analysis on the links and differences between the written and oral Christian traditions, both canonical and apocryphal. The books will also examine the relationship between vernacular interpretations of the Bible and iconography. Emphasis will be given to an anthropological reading of texts as performance, both as a component of traditional ritual systems and as a phenomenon of popular Christian culture.

As this research project intends to show, the wealth of ethnographic material that comes together in the folk Bible is part of a rich cultural heritage, specific and at the same time all-embracing, many aspects of which are still to be unveiled. A similar process of extensive recording and analysis of vernacular counterparts to Holy Writ still needs to be carried out in other geographical and cultural contexts. Wherever that might be, one ultimate caveat needs to be taken into account. You cannot depend upon translators and interpreters to acquire fieldwork data, since there is no substitute for the bond of trust which knowledge of the local language confers.

*Dr Florentina Badalanova Geller is an Honorary Research Associate in Hebrew and Jewish Studies at UCL and works at the Royal Anthropological Institute, Centre for Anthropology, The British Museum*

### Further reading:

1. F Badalanova, *The Bible in the making: Slavonic Creation stories*, in *Imagining Creation*, eds. Markham Geller and Mineke Schipper, 2008
2. F Badalanova Geller, *Folk Religion in the Balkans*, European Cultural Heritage Online (ECHO), 2006–2007, [echo.mpiwg-berlin.mpg.de/content/religion](http://echo.mpiwg-berlin.mpg.de/content/religion)
3. A Dundes, *Holy Writ as Oral Lit: the Bible as Folklore*, 1999

Dr Badalanova Geller's three-part monograph, *The Folk Bible*, is due to be published in UCL's Arts and Humanities Research Series in October 2009

# If: an Evolutionary Perspective on Altruism, Religion & Self-Sacrifice

Altruism seems an anachronistic concept in biology. At first blush, it seems to oppose the Darwinian perspective: why should one animal sacrifice food, safety, or its life for another? How can altruism be reconciled with the idea of survival of the fittest? In our first salon feature, *Sophia* arranged for geneticist and neuroscientist **John Hardy** to discuss these points with evolutionary anthropologist **Ruth Mace**. In an enlightening discussion, we consider the evolutionary forces behind dogma, as well as the dogmas of the field of evolutionary biology itself...

**John Hardy** » Altruism, in actual fact, fits squarely into the concept of Darwinism once one appreciates that the unit for selection is the gene and not the individual. Parents ensure the survival of their genetic offspring through dangerous self-sacrifice. However, as genetic relationships become more and more distant, altruistic behaviour has to be assured of being reciprocal. Over more distant genetic relationships, altruistic behaviour may work against the altruist's genes as he or she sacrifices for another's gain. And yet, a species which could master more genetically distant altruism would be in a particularly strong position to increase its numbers, since they could effectively coordinate in larger and larger groups.

**Ruth Mace** » I think that in animal behaviour nearly all the altruistic behaviour that you see is kin selection. So there is something really different in fact in humans that needs explaining. An awful lot of altruism

in humans is kin selecting too, but a significant amount is too large scale to be explained that way.

**JH** » Yes, and language must be part of that. I would say that the word 'if' is almost the altruistic word in a way: 'If you do this, I'll do that'. 'If' is the word that formalises altruism. It created conditions, possibilities, choices and decisions. Perhaps this was the word that was invented somewhere in Africa around 100 000 years ago. The group of humans who invented 'if' would have been able to plan and communicate those plans with each other. At first, that planning might

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*Although religious leaders talk about peace, maybe they aren't understanding the evolutionary origin of their own belief system. Maybe the purpose of their belief system is, in fact, to do with war*

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have been only short term and obvious: 'if you do this now, I will do that later'. Those that planned their altruistic behaviour most effectively, in the largest groups, would have competed most effectively.

**RM** » That's one model of altruism; that ought to be able to work in any species. This kind of tit-for-tat altruism: 'I'll cooperate with you if you cooperate with me'. In reality, though, in non-human species there aren't very many examples of it. The famous example is of vampire bats which either have huge meals when they are successful or are very hungry when they get back to their roost. If they're not successful then sometimes the successful ones feed them to help them get through the next few days and this is reciprocated in the future. But that study was done back in the 80s and is still the classic study which everybody cites, which suggests that there aren't actually that many examples of altruism in animals, or some-

body would come up with another one. I think reciprocal altruism is not widespread within non-human species but instead might be between species; when you have symbiotic relationships and different goods are being provided by each side. Humans have division of labour which means it is much more likely that you'll have something that somebody else wants which you can exchange. Being a cultural species means that cultural evolution has kicked in, which can potentially take you to different outcomes than pure genetic selection.

**JH** » Speaking of culture, a second remarkable change occurred as man started on his conquest: he started to have burials with symbolic offerings, suggesting belief in an afterlife. This seems to have happened relatively quickly during and after the spread from Africa and perhaps this is not a coincidence. What better way is there to ensure altruism in your cause than through the promise of an afterlife? While money is altruism deferred, religion is altruism deferred forever, and we can imagine that those societies which formalised altruism through religion, whose soldiers would die for their tribal beliefs, would easily out-compete those in whom altruism merely related to the next meal.

As a geneticist, I've always been thinking about the reason for religion: it must serve some evolutionary purpose. Personally, I think it serves a purpose in war. Historically, we see it invoked in wartime so perhaps this is its 'purpose' – it helps people in war and helps them fight wars more effectively. So although religious leaders talk about peace, maybe they aren't understanding the evolutionary origin of their own belief system. Maybe the purpose of their belief system is, in fact, to do with war.

**RM** » Some evolutionary biologists would say that was a controversial argument, not because you bring up religion, but because you are violating one of their religions, which is invoking a group selectionist argument. This is saying that evolution acts on traits which benefit the group as opposed to the individual. Classically, selection operates at the level of the gene or the individual. In the

But theorists have noted that, with cultural traits, you can actually stop that process through punishment systems or systems that enforce conformity, so religion could be a classic example of that, where you have conformist biased copying. With these processes, the differences between groups can be maintained and selection on group beneficial behaviours can actually work.



last decade or so, however, there has been a resurgence in that kind of argument because theoretical models have been used to argue that group selection can work on cultural traits even if it can't work on genetic traits. The reason for that is that in order for group selection to work, you have to have distinct groups some of which do better than others. That doesn't work if there is any migration between groups because the groups end up all exactly the same because individual selection operates much faster. Individuals which migrate into altruistic groups will do really well because everyone else is an altruist and they are selfish. Eventually everyone will end up behaving selfishly and the altruistic traits will die out.

**JH** » Yes, I understand the idea of selection acting at the level of the gene vs group selection is an argument which goes back a long time. But the idea of group selection is something that has been subverted by language. That's the power of language in a way; it allows you to make group selection work.

**RM** » I think that's a hypothesis worth testing. Language obviously has the properties that we were talking about in the sense that it has to be conformist. There's no point making up your own language because no one else will understand you. If you migrate into another group, you can bring your genes with you but you have to leave your language be-

hind. Also, linguistic groups can remain quite distinct on the map even though genetically it's a bit of a blur. Obviously we see genetic mixing but cultural traits remain distinct. This certainly happens with language; if it happens with other cultural traits then cultural group selection could potentially work.



**JH** » Another interesting thing about religion is that people are sometimes more loyal to their co-religionists in a way that one would rationally expect them to be loyal to their kin. Of course when you look genetically, for example the Turks and the Armenians or Greeks; the English and the Irish, you find that they're pretty indistinguishable but what has happened is we've enforced a separation based on religion when there isn't one based on genetics. So through language and religion we've managed to subvert what might be better for our genetic good.

**RM** » In the end it might end up being for ones genetic good because genes can hitchhike along in these groups which are doing really well. If you join a group which is doing well,

even if it involves some costly rituals it might ultimately be good if your group outcompetes other groups. But groups don't need to evolve genetically for cultural evolution to work. Cultural evolution is fast compared to genetic evolution. Some of the cultural selection models require lots of cultural generations to affect genetic traits – and nobody really knows how long a cultural generation is – maybe it's hundreds of years. I think the real question would be if you could show whether the group level benefits or the individual level benefits were more important. Maybe there are individual level benefits which are associated with these kinds of behaviours which are also group-beneficial activities.

**JH** » It's certainly true that religions generally encourage having large numbers of children.

**RM** » Yes, they are often pro-natalist; and apostasy is often associated with the worst kinds of punishment. And punishment is another really important part of maintaining these systems. They only work as group selective systems if there are big costs associated with deviating from the group. But then the evolution question comes, where did the punishment come from? It doesn't entirely solve the problem. The model still requires reasonably low levels of migration between the groups and it also takes a long for time for something to happen. But it may be that groups don't completely wipe out other groups, it may be that groups just grow as people decide to join those which are doing particularly well. The Holy Roman Empire didn't spread by wiping everyone out; it absorbed everybody and they all decided that they were Romans.

**JH** » Yes, in southern Spain the population were converted at the point of a sword.

**RM** » Indeed, if the choice is die or change, you might change. Or even if the choice isn't die or change, if those guys look like they're doing an awful lot better than your guys, you might think it was a pragmatic decision to change your religion and make sure you're on the winning team.

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*In animal behaviour nearly all the altruistic behaviour that you see is kin selection. So there is something really different in humans that needs explaining*

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**JH** » Today, we ostensibly see religious martyrdom as an unnecessary and unfortunate side effect of religious beliefs and we don't see jihads, crusades, suicide bombers and the like as central to the religions themselves. Yet throughout the history of religious beliefs it has been this way: every society has fought with god on its side promised a better afterlife for those that die on the field of battle. All religions emphasise the self-sacrifice of the one for the benefit of the many and for the glory of god.

**RM** » Obviously we do lower levels of self-sacrifice all the time. Again, it is usually for the benefit of kin. Martyrdom could perhaps be explained as an aberrant behaviour as it's particularly rare. If it's a pathological behaviour or associated with some kind of mental illness then you don't need to explain it in evolutionary terms.

**JM** » I don't agree. There's blowing yourself up and then there's a continuum from that at one end, down to

signing up to join the army. I think it's a mistake to say one thing is pathological and the other is normal. It's a continuum. We see acts categorised as pathological but I think we should have to explain this kind of behaviour, even if it's rare. In fact it's rational, it's just not something that we would agree with.

**RM »** But a risk of death is different from a certainty. The point I was making is that people think every behaviour needs an evolutionary explanation but if it's sufficiently rare then it could just be a perversion of normal behaviour. Another point is that these groups subvert the terminology of kin so they are actually ...

**JH »** ... brothers in arms?

**RM »** Indeed. They're invoking the same emotional responses as you have with people who are close genetically, but transferring them onto non-genetic kin.

**JH »** Since these behaviours have been unwavering tenets of religious beliefs, perhaps we should consider the possibility the acts they inspire are the reason that there are religions. Jihads and crusades are not an unfortunate side effect of religion: they are the evolutionary reason for religion. We should consider the possibility that religions are the product of man's evolutionary history because they have permitted those who share them to out-compete those who do not: they are altruism perverted.

*John Hardy is Professor of Neuroscience at the Rita Lila Weston Institute of Neurological Studies and Ruth Mace is Professor of Evolutionary Anthropology in the Department of Anthropology*

# Dream Houses

The 'dream sequence' is a staple of cinema, but is the act of watching a film so far removed from the act of dreaming itself? **Matilde Nardelli** takes us on an oneiric exploration...

**S**IX YEARS IN THE MAKING, *The Lotus Eaters*, a film by Canadian artist Marcel Dzama, received its premiere in the UK in the Spring of 2007. A rough cut had received a screening at the Museum of Modern Art in New York the previous year but, more grandly, the final version was projected in a mini-cinema specially installed in the London gallery hosting the artist's solo show. This was carefully fitted out with a few rows of old-fashioned seats and a pianola to provide the musical soundtrack.

On entering the darkened space, viewers might momentarily be taken aback by the oversized contours of the person already sitting in the second row, or the pianist. Adaptation to obscurity, however, would eventually dissipate uncertainty and reveal these to be mannequins – bear-headed and in suits – rather than living beings. Coming from the frenzied newness of shop-window displays in nearby Oxford Street, entering Dzama's ad-hoc cinema was like stepping into a peculiar kind of shrine. If the pianola and upholstered wooden seats gave the place the familiar unfamiliarity of the bygone, then the presence of the odd dummies enhanced its strangeness, setting it out as a dreamlike environment – if not, indeed, the setting for fantasy, reverie or dream.

In both form and content, 'dream' was here embodied by the film itself. The story of *The Lotus Eaters* centres on an Orpheus-like character who, killed by his doppelganger, enters the fantasy world he has been drawing in an attempt to revive his dead wife. Metamorphosing from still drawing into animation, and from this to flesh-and-bone human being, the protagonist's dead wife is finally able to join her husband in a dance. Unless, that is, it is the husband who has been swallowed up into a dream world, as the partying bears would suggest. This topsy-turvy logic makes this a film about a mental state, or a reality, in which wakefulness and reverie are thoroughly interwoven and ultimately indiscernible from one another.

Form-wise, *The Lotus Eaters* owes much to the oneiric aesthetics of such surrealist classics as Luis Buñuel's *Un chien andalou* (1929) and Jean Cocteau's *Blood of a Poet* (1930), whose puzzling imagery and disjointed montage it evokes. It is not only these classics' formal qualities which Dzama's film conjures, but also a sense of their oldness. The film's coupling of hand-drawn animation with jerky live-action footage (from a mixture of video, 8mm and 16mm film stock) suggests that it is an outmoded and fading dream that we are watching.

The identification of an affinity between dream and cinema is no novelty, and the evocation of the oldness of this affinity is precisely what is at stake in Dzama's piece. Perhaps the association is as old as cinema itself, certainly aided by the near coincidence between the official 'beginning' of the medium and the publication of Sigmund Freud's *The Interpretation of Dreams* in 1900. The first projected moving images were shown to a crowd in Paris's Grand Café in 1895; only a few years later Freud's text effectively founded psychoanalysis, hailing the importance of dreams as audio-visual 'documents' of the psyche.

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*Whereas the surrealists enthused about the creative and redemptive potential of the perceived affinity between cinema and dream, the link is often also used pejoratively to suggest illusion, narcosis and deceit*

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But the coupling of cinema and dream can cut two ways: whereas the surrealists enthused about the creative and redemptive potential of the perceived affinity between the two, the link is often also used pejoratively to suggest illusion, narcosis and deceit. On the one hand, there is Antonin Artaud's surrealist enthusiasm for cinema as a medium that *translates* dreams and is therefore the 'revealer' of the depths of consciousness. On the other, in *The Last Day of the Locust*, novelist and Hollywood screenwriter Nathanael West puts forth a more pessimistic view of the movie industry as a *manufacturer* of dreams, a veritable 'dream factory' for the screen and in the mind alike. Or, again, we could consider the notion of the movie theatre as itself a dream place; 'optical fairylands', as critical theorist Siegfried Kracauer described the 1920s Berlin movie palaces. Or a place where, critical faculties temporarily switched off, one is enthralled by something akin to dreaming, a kind of hypnotic stupor, as 1970s *apparatus* theorists would keenly stress.

While all of the above associations between cinema and dream are at some level at play in Dzama's installation, what is more interesting is the way that these various analogies interweave with the work's location in the gallery, or the museum. This kind of space, too, has much to do with dreaming. As Walter Benjamin put it, 'museums unquestionably belong to the dream houses of the collective'. But if this is so, what to make, not only of Dzama's housing of film inside the museum but also of his reconstruction of the movie house inside the gallery? What to make of this transposition of one 'dream house'

into another? Is it to produce an effect whereby, just as with Chinese boxes, dream nestles inside dream?

Dzama's rehousing of film and cinema within the gallery and the museum is part of a well-established trend in contemporary art; a trend by which these exhibition spaces are being increasingly darkened and, indeed, 'cinematized'. Mark Wallinger, Rosalind Nashashibi, Tacita Dean, Rodney Graham, Daria Martin, Steve McQueen: the list of artists bringing 'cinema' to the gallery could go on, and keeps getting longer. Indeed, from this viewpoint, Dzama's piece is notable only for the literalness with which it pursues this cinematization. Moreover, Dzama's immersion in the history of cinema, and his pursuit of obsolete forms of the cinematic, are representative of the particular manifestation of this tendency which is characterised by an engagement with cinema's materiality and its historical status. From the perspective of our digital age, this may seem like a symptom of nostalgia for cinema's past, if not for cinema, full stop. Yet there is more to it than melancholia: it is also a diagnosis of the nature and state of cinema itself.

What is interesting and new about this diagnosis is the tension it keeps in place between an undoing and a redoing of cinema; between a redoubling and an unpicking of its dreaminess and the dream that cinema *itself* represents. In this respect, it is worth calling upon Benjamin again. Where on the one hand, 'dream' is, for Benjamin, a synonym for lack of consciousness or alienation; on the other it is also a place of possibility, discovery and critical opening, where 'everything – even the seemingly most neutral – comes to strike us'. And what comes to strike us in this re-dreaming of cinema is the distilling of a sort of essence of cinema; the fact that movement is not so much something cinema has, but something cinema is. Thus, if *Moving Picture* (the title of Dzama's show as a whole) encapsulates the current move of cinema to the gallery, then it also indicates that the 'picture' of cinema as such is always already in motion; always already changing. What Dzama ultimately suggests is that, through obsolescence and the dream of the old, it is possible to think the reality of the new: old dreams for new realities.

*Matilde Nardelli is a British Academy Postdoctoral Fellow at the Centre for Intercultural Studies*

### Further reading:

Walter Benjamin, *The Arcades Project*, 1999

# Protocells & Plectic Systems Architecture

Rachel Armstrong describes a new model of the built environment connecting buildings to the natural world through dynamic processes and ‘metabolic’ materials.

ARCHITECTS THROUGHOUT THE AGES have likened the built environment to biological systems, but modern architecture is not alive since it is made of inert materials that are belligerent to and disconnected from the natural world. Yet, biology is far more important to architectural practice than just providing the inspiration for new forms and aesthetics. Biological processes are critical to architectural practice in terms of developing more dynamic and environmentally integrated materials.

Architect Neil Spiller’s AVATAR (Advanced Virtual And Technological Architectural Research) group is investigating materials that couple built and natural environments so that energy and information flow freely between architecture and the biosphere as an integrated process. The development of materials that possess a metabolism for use in architectural practice would confer some of the properties of living systems on our cities. These ‘metabolic’ materials would enable architecture to change over time using local sources of energy and raw materials and respond to variations in the urban environment. Metabolic materials could be designed to extract carbon dioxide and other greenhouse gases from the air and release oxygen into the environment. Such materials could even remove toxins or nanoparticles from the environment and process them into safer substances. When the metabolisms were no longer active they could senesce and decay back into their components for recycling. Gradually, metabolically informed cities could respond to local environments and habitats to create geographically distinct metropolitan forms and

urban ‘physiologies’ whose speciation and variability would be comparable to those observed in biological systems. Our cities would truly come alive.

AVATAR is collaborating with scientists, who are working in the fields of ‘wet’ Artificial Life (the chemistry of self-organising systems) and Synthetic Biology (re-engineering of biological systems) to explore new ways of making materials livelier. This new discipline within the field of architecture has been called *Plectic Systems Architecture* and, in practice, takes the form of scientific experiment with design-led outcomes. Current models of interest include *protocells*:

precursors to fully synthetic cells built from scratch in the laboratory and based on the complex chemistry of oils. Protocells are programmable and can be instructed to seek out certain kinds of environments: Martin Hanczyc of the University of Southern Denmark and Takashi Ikegami of the University of Tokyo designed a protocell system that is capable of both movement and primitive sensation. Some species are able to produce a skin that is vigorously shed.

The discarded skins are thought to be able to form sedimentary deposits or coral-like structures under certain conditions so that the technology may be thought of as being able to make artificial rock.

Uniquely, the architectures that are expected to result from these experiments will be grown from their fundamental components rather than being assembled by following an architectural blueprint.

*Rachel Armstrong is a PhD student and teaching fellow at the Bartlett School of Architecture and a researcher in the AVATAR group*

# Sequel

Running from March 25, *Sequel* was a collaboration between the Slade School and the Strang print room, which responded to works by the old masters.

This ongoing series attempts to survey overgrown and interior landscapes alike in moments of relative vacancy. By absence, the suggestion of past presence lingers. These images record a place's memory of its visitors. The calm is disconcerting and yet eerily familiar.

*Erin Gutierrez is an MFA student at the Slade School of Fine Art*



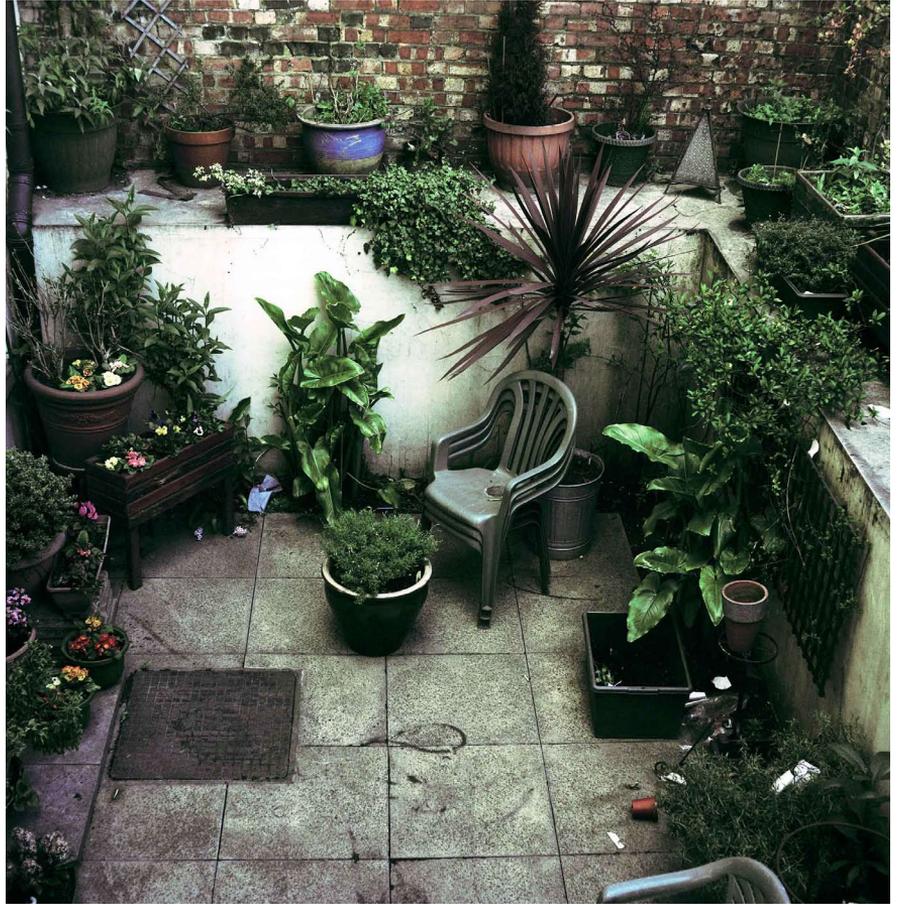
The featured photographs are part of an ongoing series of untitled works by Erin Gutierrez. Number 1 was featured in the *Sequel* exhibition as part of a response to works by the Japanese woodcut artist Ogata Gekko.



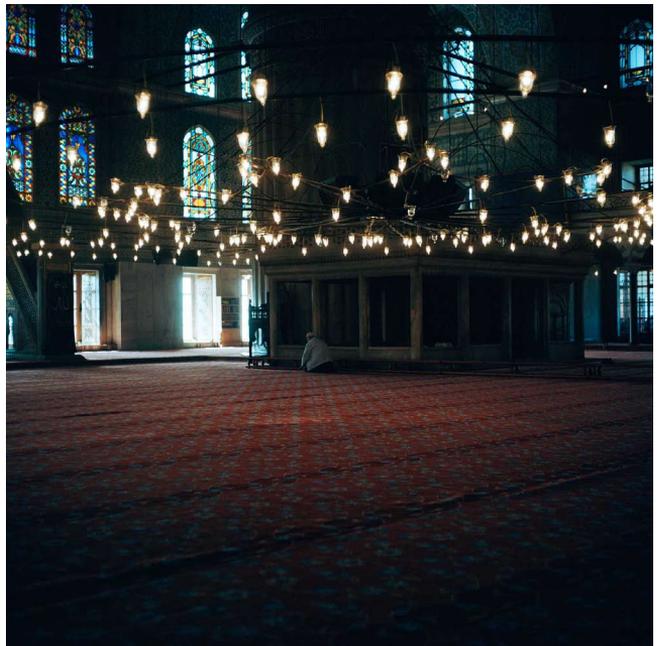
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# The Destructive Impact of Tsunamis

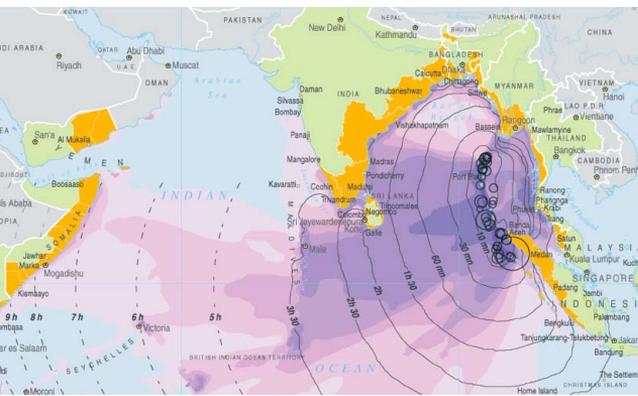
In recent years, tsunamis have exacted a notoriously heavy cost, both on human life and the global economy. While prediction of the event is hard enough, modelling the likely extent of the damage is even more complex. **Ingrid Charvet** summarises recent developments in tsunami science and discusses what steps can be taken to mitigate the effects of future events.

**T**SUNAMIS ARE DESTRUCTIVE WAVES caused by a rapid displacement of a large volume of water. Contrary to popular belief, tsunamis are not single waves: several are generated simultaneously. They are commonly caused by marine earthquakes, volcanic eruptions, landslides, underwater explosions and asteroid impacts. The Indian Ocean tsunami in 2004, which destroyed and damaged coastal habitations, structures and vegetation on a global scale, resulted in approximately 275 000 casualties. However, out of all the natural hazards impacting human communities, tsunamis are probably the least understood, and the least predictable.

Before recent advances in technology, such as tsunami buoys and satellite imagery, it was almost impossible to record the real event, and so there was a lack of field data for scientists to work with. The 2004 tsunami was a turning point for tsunami science because it was so extensively recorded, allowing scientists to gain a deeper understanding of the destructive nature of the wave. The wave by itself is not the only culprit, however, and this article will illustrate how amplification by local factors can significantly enhance the wave energy.

Understanding the nearshore activity of a tsunami is crucial for prevention and mitigation strategies in countries at risk. The propagation of a tsunami from the source through the deep ocean can be reasonably well modelled numerically, but these models generally fail to produce accurate results nearshore and onshore. Indeed, such areas are subject to complex processes as the waves interact with beaches, sediments and coastal structures. The 2004 tsunami illustrates how local amplification can modify the tsunami and make it potentially very destructive.

The 2004 tsunami was generated by a submarine earthquake (9.3 on the Richter scale) in the Sunda Trench of the Indian Ocean. Offshore, the tsunami's characteristics could be observed from the JASON



Above left: propagation of the 2004 tsunami and affected countries, from [www.grid.unep.ch](http://www.grid.unep.ch)

satellite, recording world ocean topography data: the main tsunami period was 40 minutes, but several waves were observed ranging from 30 to 50 minute periods. Its maximum amplitude was 80 cm; it travelled at approximately 200 metres per second, and it was approximately 500 kilometres long. In the open ocean, tsunamis have very long wavelengths and very small amplitudes, but as they approach the shore, they shoal up dramatically and wave heights are capable of reaching over 30 metres in some places. One of the greatest wave heights recorded in Thailand – one of the countries closest to the source – was 19.6 metres, in the northern region of Ban Thung Dap.

#### TSUNAMI ENERGY: CLOSE SITES VS DISTANT SITES

If we look at the wave propagation radiating from the source (see map), it is interesting to notice an empty wave zone located to the north and south of the wave affected area. This striking feature means that the tsunami energy was concentrated on an axis perpendicular to the source. Similar observations have been made in the past, such as in the numerical modelling of the 1964 Hawaii tsunami. This meant that countries like Thailand were located directly in the path of the most energetic tsunami waves. Following these first conclusions on wave directionality, further modelling work shows that, on a global scale, the tsunami energy was channelled over ocean ridges. These ridges acted as waveguides and allowed the tsunami to stay highly energetic over great distances. The very nature of the tsunami allows it to travel great distances without significant energy loss, but ridges seem to enhance this phenomenon, which explains why the 2004 event could propagate so vastly through the world's oceans and be recorded as far away as Alaska.

The map shows that some sites in the intermediate field underwent significant damage (e.g. Bangladesh) or recorded higher tsunami waves than expected (e.g. Oman), although they were not on the direct path of the highest waves. One explanation for the extensive damage throughout the Bay of Bengal is the generation of numerous reflected waves, as the planar configuration of a bay makes the signal reflect in multiple directions all around the coast. Indeed, it has been estimated in results from physical experiments as well as numerical modelling that reflected waves are likely to carry more energy than the direct wave. In the 2004 tsunami, as the distance from the source increased, multiple wave trains occurred and the highest waves came later. The formation of these

far-field higher waves was due to the global and regional topography. Incoming waves pump additional energy to coastal regions, enhancing local oscillations. Oman is one of numerous locations that experienced the resonance effect during the event.

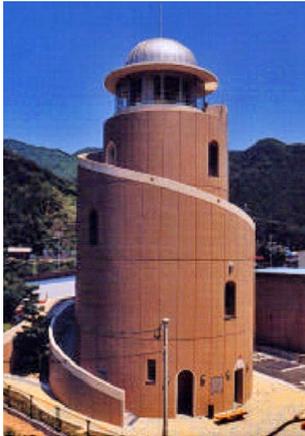


#### INTERACTION WITH ISLANDS AND SHORELINES

As tsunamis reach the shoreline, they measure several metres in height and have also been reported to accelerate. As a striking example, amateur videos from tourists staying in Thai resorts during the 2004 tsunami show that the wave velocity went from 8 to 35 kilometres per hour at the shoreline location; greater velocities are likely to contribute to enhanced damage.

Islands can be either a good or a bad shelter. They seem not to be subject to significant wave amplification if located in the open ocean, where waters are deeper so tsunami heights are small. This is what happened with the Maldives: with their 'pillar' structure the waves passed between them without shoaling up drastically. However, local wave amplification will occur if islands are located in coastal areas, where the highest waves are created. An experiment aimed at understanding the Babi Island (Indonesia) tsunami disaster of 1992 examined a conical island hit by a tsunami. In this experiment, the wave crests split around the island and gave rise to constructive interference (where colliding waves merge to form a higher wave) on the opposite side of the island from the initial impact. This ultimately endowed the waves with more energy and made them penetrate further inland.

On many coasts there is a sharp slope in the ocean floor where the deep ocean meets the continental shelf. This causes the impulse of the wave to be reduced significantly, and long tsunami waves are deflected and tend to travel parallel to this slope. This is what seems to have happened with the waves



reaching Sri Lanka in 2004, where waves reaching the eastern shore were redirected to shoal up on the south-western side of the island. By contrast, the amplitude of the waves reaching Sumatra was much greater, showing that there was no such reflection from the slope.

Some places were spared from the tsunami thanks to shoreline protection: in Patong beach in Phuket, South Thailand, a small sea wall separating the beach from the road reduced impact velocities. In South East India, coastal communities were protected by mangroves. Conversely, however, small openings in shoreline protection will greatly enhance damage due to constriction of the flow, which in turn leads to greater velocities. For example, during the Nicaragua Tsunami of 1992, the reef facing *El Transito* had an opening to facilitate navigation: the land behind was devastated whereas the adjacent land was spared. The same effect was observed in Sri Lanka in 2004, where coral mining had created a similar channel in which the tsunami accelerated so much that it was able to penetrate inland and derail a moving train carrying more than 1000 people.

#### DEFENDING AGAINST THE TSUNAMI THREAT

As we have seen, there is more to the destructive power of tsunamis than the initial wave. A tsunami-triggering event generally generates many waves. The first waves are the highest if they follow a direct route from the source, otherwise processes such as scattering, reflections, refraction and local resonant effects may strongly amplify the waves arriving subsequently. Therefore, it is important to know where the potential sources are and take them into account in conjunction with geological evidence of past events when planning for tsunami defence and evacuation measures. Inland, large flow depths

and penetration are associated with extensive damage, and occur in places where the wave can be amplified by local coastal effects: areas with low lying topography, on the lee side of islands, or with unprotected shorelines.

The closer structures and buildings are to the shoreline, the more vulnerable they are to wave damage; and more so if they are poorly engineered. Interestingly, however, pillar structures have been shown to be rather tsunami-proof, either at a small scale, such as pillars and columns on churches and temples, or at a large scale, such as the topography of open ocean islands. Some countries, such as Indonesia, have already learned their lesson and are currently building tsunami-proof structures, mounted on resistant stilts. In Japan, tsunami shelters designed to resist the tsunami load also adopt a cylindrical form.

Tsunami science is a fast-growing field of research. Matters of everyday life, however, can interfere with the best intentions. The new tsunami-proof Indonesian houses have large open areas below, which are designed to allow the free flow of water, but these are starting to be used as parking or storage areas. Tsunami walls have been built in Japan, but they are limited in height (4.5 metres). So if the tsunami waves are higher the walls will easily be overtopped, and if no appropriate warning is issued on time, lives will be lost. This is what happened in the devastating May 1983 tsunami in the Sea of Japan (where recorded wave heights reached 14 metres).

One of the main issues for human communities at risk is to stay prepared for such deadly events, which, typically being very rare, are easily forgotten from one generation to another. Responsibility for such preparation lies not only with governments, who must put in place effective prevention, communication and mitigation strategies, but also with individuals, who must strive to remain aware of the threat and take responsibility for their own safety, both before and during the event.

*Ingrid Charvet is a PhD student in the Department of Civil, Geomatic and Environmental Engineering*

#### Further reading

1. CE Synolakis & EN Bernard, Tsunami Science before and beyond Boxing Day 2004, *Philosophical Transactions of the Royal Society A*, 2006
2. SS Voit, Tsunamis, *Annual Review Fluid Mechanics*, 1987

# Approaches to Creativity & Discovery

Should we take creativity seriously at a time of global financial and environmental crises? Not if we want to find solutions, argues **Julian Evans**. In an article based on the Presidential Lecture to the Chemical and Physical Society he proposes that there is an intimate connection between laughter and creativity. Is he serious?

**W**HERE DO GOOD IDEAS COME FROM? There is precious little in the curriculum about observation, creativity and discovery, which seems odd given their importance in the history of ideas. Science is presented as pictures at an exhibition after the studio is tidied; as a pristine building after the construction site is cleared; as a series of pure, clean, creative acts. We see the product but not the process. To find out what we've missed, let's break into the building site!

## ON THE DIFFERENCE BETWEEN LOOKING AND SEEING

Most philosophers of science agree that all observations are theory-laden: students can sometimes only make observations in laboratory classes if they already know the relevant theory; something stops them seeing what is there. Perhaps there is a preconscious filter that shuts out 'what the teachers don't want'; a template for a good mark that extinguishes everything else. Similarly, post-graduate researchers have a filter based on the perceived expectation of their supervisor. If all observations are theory laden, by teaching theory do we teach what to see? Worse still, do we teach what not to see?

Before September 1985, no one had seen the hollow, often football-shaped carbon structures called *fullerenes*. One day, English chemist Harry Kroto found an odd mass spectrometer peak at 720 and received a Nobel Prize. After September 1985 fullerene spheres and tubes were everywhere – they are in candle soot! The important question, asked by Professor Peter Atkins in

an article in the *Times Higher Education Supplement* on March 14 2009, is: why were they not seen earlier?

On Friday, March 24 1933, ICI chemists Reginald Gibson and Eric Fawcett were experimenting with ethylene and benzaldehyde at high pressure. On the Monday when they dismantled the vessel, there was waxy stuff on the wall. Instead of a cleaning challenge, this became the discovery of polyethylene, the highest tonnage synthetic polymer ever produced.

In the late 1960s an employee of a company making handbrake cables was on his way to morning coffee when he had an idea that made the company a lot of money. A handbrake cable is much like a bicycle cable, only bigger, and to secure the spiral outer to the chassis you need to turn, bore, mill and screw-cut a brass adjuster. He had worked most of his life with cables but he suddenly realised that the screw is already there, in the spiral of the outer. All they had to do was injection mould two lock-nuts and the brass adjuster was redundant.

In 1928, Alexander Fleming noticed that a plate contaminated with *Penicillium notatum*, was free of staphylococci in the vicinity of the mould. This ranks among the greatest observational achievements of all time.

Louis Pasteur gave us this aphorism: 'In the field of observation, chance favours only the prepared mind'. When we read of Fleming's discovery of penicillin, we find that culture dishes were always becoming contaminated. Lots of tests were discarded. What is chance in this context? Wasn't Fleming's genius to see what had probably been staring others in the face? Isn't this really

about the difference between looking and seeing? Was it chance that enabled the cable manufacturer to see that the thread was already there? Every hour of every working day he had been looking at handbrake cables.

What is a prepared mind? Were other chemists in Fleming's lab educationally prepared to notice an absence of staphylococci? Were electron microscopists prepared to see fullerenes before 1985? Surely our cable manufacturer must have known everything there is to know about handbrake cables, so why did it take him so long?

## CREATIVITY IN SCIENCE

A huge amount has been written about creativity in science. In the 1920s the emphasis was on unconscious processes such as 'incubation' and 'intimation'. Later, in the 1960s, Liam Hudson tried to divide everyone into two groups: convergent and divergent thinkers. Divergent thinkers could, for example, write down twenty uses for a toothpick in one minute whereas convergent thinkers could only write down one or two. The 1960s 'stimulus-response' psychology of creativity also highlights the importance of making unusual associations.

In the 1950s, Humanistic psychologist Carl Rogers' approach (see Box 1) endeared itself to scientists and articulated several principal ideas. Openness to experience expresses an absence of preconscious filters. Internal locus of evaluation expresses independence of peer pressure: we know what is good, we can trust ourselves. Allied to this idea is independence from authority; there is a hint of iconoclasm in creativity.

Toleration of ambiguity appears throughout the literature on creativity. For discussion of play, we may use Rogers' own words: '...the ability to play spontaneously with ideas, colours, shapes, relationships, to juggle elements into impossible juxtapositions, to shape wild hypotheses, to make the given problematic, to express the ridiculous, to translate from one form to another, to transform into improbable equivalents...'

Leisure also plays a part; Ernest Rutherford did not allow his staff at Cambridge's Cavendish laboratory to work after 5pm, he wanted them to relax. Among his students, John Cockcroft and Ernest Walton won Nobel Prizes.

Many people share the view that something valuable was lost when we gave up tearoom discussions, but I would suggest that also lost was an 'internal tea room'. Where can we go to be free from the barrage of emails with their demands? Herman Hesse in *Demian* says: 'We should be able to go inside ourselves like a tortoise.'

## BOX 1: KEY PRINCIPLES OF CREATIVITY AS DESCRIBED BY CARL ROGERS

*Openness to experience:* Each stimulus is freely relayed through the nervous system without being distorted by defensiveness. Lack of rigid boundaries in concepts, perceptions and hypotheses.

*Internal locus of evaluation:* The centre of judgement lies within the boundaries of self; values are not established by praise or criticism of others.

*Toleration of ambiguity:* Ability to accept conflicting information without forcing closure.

*Ability to play with forms and concepts:* Through the spawning of thousands of possibilities, there emerge one or two forms with permanent value.

## THE ROLE OF MISCHIEVOUSNESS

Richard Dawkins tells us that children are genetically programmed for obedience. No teacher could get through the A-level if students questioned their elders: 'What is a force? What is *actually* between the poles of the magnet? What causes electronic charge?'

The following story has a long tradition. In an A-level physics exam, a question reads: 'You are given a barometer; explain how you would use it to estimate the height of a tall building.' One candidate replies: 'I would drop the barometer from the top of the building, time its descent,  $t$  and estimate the height,  $s$  from  $s = \frac{1}{2}gt^2$  where  $g$  is the acceleration due to gravity.' From one examiner, this effort gets a zero mark because the student has clearly failed to understand the question. Another examiner disagrees; the method would work, after all. They decide the student should be interviewed by the panel of examiners. The chairman begins: 'We wonder whether there are any other methods whereby you might use the barometer to estimate the height of a tall building?' 'Oh yes', says the student. There is a great deal of relief around the room. 'Please tell us', says the chairman. 'Well I would go into the caretaker's office on the ground floor and say "If you can tell me the height of this tall building, I will give you this elegant barometer."'

Here, refusal to measure air pressure is a declaration of independence from teachers and examiners, much as an adolescent gains independence from parents. Risking a zero mark is analogous to risking being thrown out of

the family home after an argument. The student can take the risk because intellectual resources have appeared from beyond the examiner; in the same way the rebellious teenager finds inner emotional resources that will serve throughout life without parental consolation.

Harvard professor of education, William Perry, charted the intellectual maturation of college students. They begin in a world of duality; everything is right or wrong, true or false, good or bad. When things not known are encountered, the student first concludes that the teachers are no good, then that they are playing a game to 'make us find the answers for ourselves.' In later stages, through participation in research, the student realises that what is not known is extensive, and, set against it, knowledge seems rather limited. Young people who previously compared themselves to others now begin to compare what they know to what is not known and a new humility settles upon them, resulting in newfound openness. Perry waves them farewell thus: 'The student experiences the affirmation of identity among multiple responsibilities and realises that commitment is an ongoing, unfolding activity through which he expresses his professional lifestyle.'

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*If all observations are theory laden, by teaching theory do we teach what to see?  
Worse still, do we teach what not to see?*

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In an interview in the *Financial Times*, in February 2009, one-time UCL professor of pharmacology Sir James Black said: 'Our brains seem to be organised to make random comparisons of the contents of our memories. Daydreaming allows the process to go into freefall. Suddenly there is a new idea, born with intense excitement. We cannot organise this process but we can distort or even defeat it.' Black alludes to a form of combinatorial processing which embraces many of the features in the literature on creativity: play, leisure, disorganization etc. Combinatorial methods are used because they allow unconstrained observation.

Under the Popperian view of science, theory precedes experiment. Francis Bacon gave us a different view: experiments are done without much theory and from the array of data, we extract rules. Combinatorial experiments are based on Baconian science in which *experiment precedes theory*. Black's view of creativity gives an insight into how the mind can escape from the 'all observations are theory laden' trap that prevents progress.

## LAUGHTER & CREATIVITY

By what mechanism does the inner adjudicator select from the huge combinatorial pool? People often laugh when they get an idea. But what exactly is the evolutionary function of laughter? To help with breathing? The only plausible theory in the literature is to indicate to others that a putative danger was in fact a false alarm.

Why does the barometer story make us laugh? I think it originates from the moment we realised that in science, we had made a connection with something that stood above and beyond ourselves, our teachers and our parents. I have a suspicion that laughter and creativity live in adjacent semi-detached houses. When laughter laughs, creativity wakes up, and when creativity wakes, laughter laughs louder.

Is laughter connected with finding creative solutions and hence with survival? Does responsive laughter signify agreement? Is the creative solution that extinguishes compromise recognised by laughter, the shout of survival?

There is a problem with this interpretation: laughter also identifies completely ridiculous solutions. Suppose the tribe is under attack. Someone suggests digging holes so that everyone can put their head in them, ostrich-like, in order not to be seen; this might get a laugh but not promote survival. On the other hand, digging holes so that the attackers fell into them might help survival. Is it possible that laughter has chosen this particular line of thinking from the combinatorial process? How does it know that a good solution lies ahead?

It doesn't. It simply sends up a signal that a break with conventional thinking has been made. We have to do the rest. Remember, if all observations are theory laden, we cannot break free. The Baconian combinatorial method allows us to escape but we still need a way to select from the huge matrix. There is a strange similarity between a joke and a creative solution. Is it possible that these breaks with convention have been so important in the past that, through evolution, nature has conferred upon us laughter and endorphins in order to help us identify creative solutions and so survive?

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## Further reading

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# Democracy Begins at Home?

## The role of public participation in British planning

It has often been assumed that public involvement in local government planning processes brings significant practical and democratic benefits. But the reality in Britain has proved much less straightforward, explains [Arata Yamamoto](#).

**T**HE ROLE OF PUBLIC PARTICIPATION in planning has long been assumed to be a positive and democratic one. It is claimed that such participation is essential for bringing transparency and accountability to bureaucratic planning processes. When successful, theorists argue, participatory practices can help reduce conflicts of interest between planning professionals and the general public, making the planning process more efficient in the eyes of both planners and citizens alike.

Since coming to power in 1997, the New Labour government has championed such a participatory approach in Britain, passing legislation supporting a more collaborative form of planning. The aim was not only to improve the efficiency and effectiveness of the planning process, but also to promote greater trust in local government, where the practices of planning as well as participation have the most direct consequences for citizens. Much has been promised by the recent expansion of participatory practices in British planning, and expectations are correspondingly high. But the big question is: how are these reforms working on the ground?

Recent analyses seem to favour scepticism. The democratising effects of participatory practices are described by many researchers as at best mixed, with little

evidence to suggest that they lead to greater recognition of ordinary citizens' views by planning authorities. Moreover, planning analysts frequently point out that effective participation by all sections of the public is particularly difficult to achieve. Even when a large section of local community does participate, it is often motivated by so-called 'NIMBY-ism' (Not In My Back Yard). Decisions on the location of waste disposal facilities provide a prime example. Simin Davoudi, Professor of Environmental Policy and Planning at Newcastle University, has described how planning authorities often feel compelled to avoid specifying a site location for refuse disposal in their Local Plans, simply to avoid the inevitable deadlock resulting from a stream of vocal community opposition groups and public inquiries. In other words, the provision of a facility that is essential to the local community can be endlessly delayed if that community is allowed a key voice in its planning.

In addition to the problem of selective participation, a number of other drawbacks to extensive participation exercises have been reported by planning authorities and there is now growing scepticism amongst planning authorities on the benefits of extensive participation schemes. In a comprehensive review of such processes

in England, Vivien Lowndes, Professor of Local Government Studies at De Montfort University in Leicester and others found that 27% of all local authorities expressed predominantly negative views on accommodating extended public participation. They gave the unrealistic level of expectations raised by enhanced public participation processes as their chief concern.

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*Planning authorities often feel compelled to avoid specifying a site location for refuse disposal in their local plans, simply to avoid the inevitable deadlock resulting from a stream of vocal community opposition groups and public inquiries*

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These findings present major challenges for a significant body of theoretical literature called communicative planning theory, which has been particularly influential within planning thought since the 1980s. Within British planning, its position is perhaps most eloquently expressed by Professor Patsy Healey in her 1997 book, *Collaborative Planning: Shaping Places in Fragmented Societies*. For Healey, planning represents a process of collective decision making, which should be designed specifically to reach consensus among all those who have a stake in planning decisions. The process should act as a counterbalance against unequal distributions of power, which would ordinarily be a barrier to reaching consensus among participants with conflicting planning interests and, perhaps more crucially, a varying degree of resources and influences to bear. Healey believes that successful collaborative practices can eliminate the problems of selective participation altogether, because a planning decision reached through universal consensus implies that all planning interests, however marginal, are given thorough consideration. As such, it becomes a rational choice for all citizens concerned to participate in the planning process. Thus, Healey makes a normative case for planning authorities to act as conflict mediators rather than key decision makers. They should be critical of their own actions too, so that they are motivated only by the aim of ensuring that all planning interests are represented in decision-making processes. Yet, despite sporadic claims to have established genuinely collaborative forms of planning as envisaged by Healey, planning authorities have not, in general, overcome the problems of selective participation and resource limitation. There is an increasing awareness that extensive participatory

practices only rarely bring significant democratic benefits to planning processes.

Perhaps these observations merely show that theoretical knowledge capable of yielding consistent democratic benefits is presently not yet available to planning authorities. But, on a more realistic level, they suggest an urgent need for emerging planning theories to move away from assuming public participation to be inherently positive and democratic. Rather, theorists should provide more realistic insights into the costs as well as the benefits of accommodating extensive participatory practices.

One approach currently gaining recognition among planning theorists emphasises the importance of the institutional dimension. This approach views planning authorities themselves as rational and strategic actors, rather than neutral facilitators. The outcomes of participation processes are analysed with respect to key features of individual planning institutions and how they affect the consensus-forming process. Other emerging planning theories have focused on the structures of governance, power relations, and other contextual factors that seem better able to explain the mixed outcomes from participation processes. Rather than simply assuming that public participation automatically democratises planning processes, it is this very variation in outcomes that is at the heart of recent theoretical developments in planning literature. Explaining the respective successes and failures of public participation processes under New Labour is beginning to provide planning theorists with more sophisticated tools for further analysis, and providing much-needed insights into the state of democracy in British planning today.

*Arata Yamamoto is a PhD Student at the Bartlett School of Planning*

### Further Reading:

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# Development & Wildlife Conservation

*Dilemmas of an indigenous hunting  
tribe of the Eastern Himalayas*

Cultural knowledge and practices of indigenous tribes are not only interesting in their own right; anthropological research can also play a key role in successful development and ecological projects, writes [Ambika Aiyadurai](#).

**T**HE SUN WAS SHINING BRIGHTLY after three days of rain. The village boys, one by one, appeared from their huts actively looking for birds. A cloth bag across their shoulders and with catapults around their necks, the boys strolled by the roadside. They scanned the tree tops and chucked a handful of carefully picked pebbles. One of the boys was Ajanso, a 12-year old who was extremely energetic and loud. Several brightly coloured barbets and black bulbuls flocked from the trees. This excited Ajanso. He ran frantically downhill to pick up a bird he had just hit and came back carrying a dead barbet. One of his friends cleared the belly feathers commenting, 'Mmm ... lot of fat', with a smile that seemed to indicate how good it would taste. Two boys followed Ajanso as he headed home, where the bird was thrown casually into the hearth with all its feathers. Together, the boys devoured this tiny bird in minutes.

It is very common to see young boys catapulting birds in the Eastern Himalayas. Unlike children in the rest of India who spend most of their free time playing cricket, boys in these parts enjoy both the cricket and catapults. They learn this skill very early in life and become experts at catapulting small game. Ajanso will soon grow up to be a good farmer and hunter like his father. By the age of ten he knew where one could find different kinds of birds as well as which seasons to look for them. He could even identify several birds by their calls.

Ajanso belongs to Chipru village in the Mishmi hills in Arunachal Pradesh, Northeast India. The Mishmi are one of 26 major indigenous tribes in the Arunachal and there are an estimated 15 000 Mishmi people spread across 340 villages. Mishmi have three major sub-groups and practice shifting cultivation which involves cutting, burning the vegetation and growing crops on the burnt land. They were hunter-gathers in the past and even now hunting is still a large part of their lifestyle, culture and economy. Mishmi, like other tribes in this region, have always hunted wild animals, both for their own consumption and for trade. The tribe uses various animal parts in its medicine, but it is the cultural aspects of hunting which are even more interesting than the consumptive value of wildlife.

Hunting traditions are much in evidence across the region and every Mishmi hut has a large bamboo trophy board decorated with skulls of wild animals hunted both by the current generation and their forefathers. The trophy boards are a status symbol displaying the prowess of the hunter, and generally consist of a series of neatly arranged skulls of barking deer (*Muntiacus muntjak*), wild

boar (*Sus scrofa*), takin (*Budorcas taxicolor*), Himalayan goral (*Naemorhedus goral*), serow (*Capricornis thar*), Himalayan black bear (*Ursus thibetanus*) and, occasionally, wild cats.

Articles made using wild animal parts are noticeable in the everyday lives of Mishmis: many carry bags made from black bear skin and offering smoked wild meat as a bride's dowry is the norm. Skulls were used as currency in the past. Today, in remote villages, skulls are bartered for bottles of rum and whisky with soldiers in the Indian army and wild meat is offered to guests during village festivals and weddings. When people fall ill, a shaman priest who is also a healer sacrifices domestic livestock, fowl and pigs for quick recovery. For this reason, domestic animals are kept as a reserve for medical emergencies in remote regions like the Mishmi hills. Spiritual and cultural reasons take precedence over the practical uses of wildlife in the lives of Mishmi, but there is also an extensive trade of wild meat and other wild animal parts.



The strong tradition of wildlife hunting emerges from the Mishmi's animistic beliefs. Regular sacrifice of domestic fowl, pigs and cows is believed to appease the spirits, which is important for protecting the villages, farms and forests from floods, famine and disease. Hinduism is not practised in the Mishmi hills, though other tribes in Arunachal Pradesh follow Buddhism and Christianity (a recent but fast-spreading religion due to missionary work, which is replacing animism). Consumption of beef and pork is common with a preference for wild meat – unlike the Hindus in mainland India who are largely vegetarian. Many villagers prefer to eat wild meat because they find it tastes better and consider it 'purer' than meat from do-

mestic animals, which tend to eat refuse lying around the village. Moreover wild animals are both free and thought of as an inexhaustible resource.

Wildlife hunting is illegal in India under the country's Wildlife Protection Act (1972), which bans all forms of wildlife hunting across the entire country. The ban has impacted on the livelihoods and lifestyles of many communities, although places like Arunachal Pradesh have remained largely unaffected by the law, with both geographical remoteness and the strong cultural aspects of hunting making enforcement difficult.

Arunachal Pradesh, nestled in the Eastern Himalayas between the oriental and Palaearctic zones, harbours unique and rare biodiversity. It is something of a 'biodiversity hotspot', attracting biologists and ornithologists to the region for ecological surveys and research. Large areas of forests and remote villages still remain unexplored due to its remoteness and restrictions imposed by the Indian army along the Sino-Indian border. Recent scientific explorations and surveys have even led to the discovery of new mammals and birds in the area, including *Bugun liocichla*, a babbler from Eaglenest Wildlife Sanctuary, and leaf deer (*Muntiacus putaoensis*) in Eastern Arunachal Pradesh.

Like other parts of Northeastern India, Arunachal Pradesh has spent decades cut off from mainland India in terms of economic and infrastructural development, with both its geographical isolation and cultural distinctness contributing to its slow rate of development. But in recent years a wave of development has begun to sweep through the region. While change may be inevitable, the speed at which development is taking place is worrying. Not only do the benefits of development not spread uniformly, the new wave of hydroelectric dams and roads is placing the region's unique biodiversity under threat. Indigenous people are particularly vulnerable in the face of development since their needs often ignored, as well as suffering the consequences of environmentally damage. Carefully structured policies that are sensitive to local people's interests are urgently needed.

Indigenous knowledge has an important role to play in the success of development, conservation and ecological research projects alike. Projects developed without involving such local knowledge are more likely to fail on the ground, despite the use of modern 'scientific' techniques. The traditionally deep division between the social and natural sciences often creates a barrier in this respect, because we miss out on important opportunities to understand a society in a holistic way. Unfortu-



nately, inter-disciplinary research seeking to understand the cultural linkages between natural resources and indigenous groups in India is rare. In a country where religion and culture pervade all aspects of life, missing out their implications for resource use and hunting could be a serious mistake.

Chipru village is not immune to change. By the time Ajanso grows up, his village will look very different. Whether the trees, rivers and wildlife will still be there is doubtful. We can only hope that he and his other Mishmi friends do not end up feeling that development in the region has failed them, their culture and the natural resources. The task we have is to make sure the development and conservation of culture and natural resources is balanced and made sustainable. This is challenging, but can also be a source of valuable opportunities.

*Ambika Aiyadurai is a Masters student in the Department of Anthropology*

*Image credits: Ambika Aiyadurai*

# Walking in the City: Towers, Traces and Urban Narratives

In the bewildering chaos of the city, it is easy to lose the spatial sense of urban reality. **Karolina Kendall-Bush** recounts new ways of approaching and getting to know the spatial dimension of urban buildings and streets through sensorial narrative experiences.

**O**UR WALKING TOUR GUIDE points to the towering structures of London's historic and financial centre – the City – and informs us that they populate the area we will traverse this Saturday morning. The Openhouse London Architecture Tour does not, however, start on the streets of London looking up at the City's skyscrapers; rather, it starts with walkers and guide looking down upon them. We are gathered around a scale model of London at the Building Centre, just off Tottenham Court Road. The model includes buildings that already exist, alongside others that soon will. Our bird's-eye view over the City is suggestive of the views to be seen from these real and projected towers, and recalls cultural theorist Michel de Certeau's introduction to a chapter on walking in the city in his influential study *L'Invention du Quotidien (The Practice of Everyday Life)*. He starts not on the ground looking up, but looking down from a great height: the 110th floor of the World Trade Centre. De Certeau is thus a suitable guide to understanding the ambulatory experience of this walking tour.

Looking down at the model of London, our assembled group of walkers are removed from the physical contact and chaos of the streets. Likewise, de Certeau does not start his chapter on walking amid the hustle of people on the pavement; rather, looking down from his privileged position he describes himself as a voyeur and a reader. The confused paths of walkers on the ground – who are apparently blind to the spaces of the city – create a confused and complex urban text that, though incomprehensible at ground level, becomes legible from a great height. Looking down at the model of London at the Building Centre, we, like de Certeau, are able to see all of the City's landmark buildings at once and understand, or read, the complex street patterns that link them.

Disembarking from a minibus at the Royal Exchange to start our walking tour in earnest, we can no longer be voyeurs but become what Certeau calls 'practitioners' of the city. Blind wanderers upon the city's floor, we twist around, trying to orient ourselves. The Royal Exchange faces us, Mansion House is behind, and the Bank of England is to our left; yet the City of London's two tallest towers that situate the City so clearly in the model; Richard Seifert's Tower 42 and Norman Foster's 30 St Mary's Axe (more commonly known as the Natwest Tower and the Gherkin, respectively), are invisible from this vantage point. The previously legible patterns of streets, buildings, courtyards, and gardens are obscured by the monumental façades that surround us.

At first our guide keeps to the broad thoroughfares immediately surrounding the Royal Exchange, leading us first to James Stirling's 1 Poultry Street and then Nicholas Hawksmoor's St Mary Woolnoth. Quickly, however, the expansive width of the street contracts as we start to move along hidden pathways, and are plunged into the ancient street patterns that have survived the City's continual process of renewal. We wander through a series of narrow alleys and covered walkways and now trust to more than sight to direct us. We now rely on what de Certeau describes as a 'style of tactile and kinaesthetic appropriation', or footsteps, to lead the way.

Architectural theorist Juhani Pallasmaa contends in his book *The Eyes of the Skin: Architecture and the Senses* that we confront the city with our bodies, measuring spaces with our legs, and sensing our architectural surrounds with not just the eyes, but ears, nose, skin, tongue, skeleton and muscle. Walking in single file behind our guide we smell the musty scent of old stone, touch the smooth white tiles that clad some of the walls, measure the confined space of the alleyway with our bodies as we pass one of the City's still existing chophouses and

emerge opposite Jamaica Inn Wine House; the site of one of London's first coffeehouses. Walking through these spaces we employ all our senses to navigate and orient ourselves on our way.

The towering landmarks of the City slip in and out of view as we disappear into, and emerge from, narrow walkways. The Natwest Tower appears as if from nowhere as we look up just by the Jamaica Inn; Richard Rogers' Lloyds Building and Norman Foster's newly completed Willis Building catch us unawares as we emerge from the Victorian Leadenhall Market; and, turning to walk between the Lloyds and Willis buildings, Foster's Gherkin surprises as it rises before us. The text of our walking route that, at the Building Centre was made legible by sight of the City's towers, can now only be read if we utilise our other senses.

The tour navigates its way through the iconic, the idiosyncratic, and the newest buildings of the City and finally finishes outside St Paul's Cathedral. The twisting paths of our footsteps have given shape to the City's spaces, weaving together disparate places in an urban narrative. Taking part in this walking tour we have become practitioners of the City. Walking, we have created an ambulatory narrative comprised of the tactile, aural, olfactory, and visual traces experienced along the way.

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Department of French*

### Further reading

Michel de Certeau, *The Practice of Everyday Life*, trans. Steven Rendall, 1984



### THE SÁMI MAGIC DRUM

From November 27 2008 to January 18 2009, Room 3 at the British Museum hosted a small exhibition where the object in focus was the 17th-century Scandinavian Sámi drum pictured above. The Sámi people, usually mistakenly referred to as 'Laplanders', are the indigenous people of the Sápmi region of Northern Europe which spans parts of Sweden, Norway, Finland and Russia.

For Sámi shamans, drums such as this – most probably used to accompany *yoking*, a traditional Sámi style of singing – were a medium of divination. Each shaman coming into possession of the drum would depict a series of designs on its membrane, often representing spiritual journeys and including images linked to aspects of Sámi life. On this particular drum, reindeer, the sun and moon and a man in a boat travelling across the underworld sea are said to be still visible.

The drum is part of a greater Sámi collection in the possession of the British Museum. Unfortunately, due to their fragility, these objects cannot be displayed for long as this would endanger their own existence. The short public appearance of the Sámi drum – originally part of the collection belonging to Sir Hans Sloane (1660–1753), the Museum's founder – also celebrated the 250th anniversary of the British Museum, which in January 1759 opened its doors admission-free to 'all studious and curious Persons'.

*Elettra Carbone*

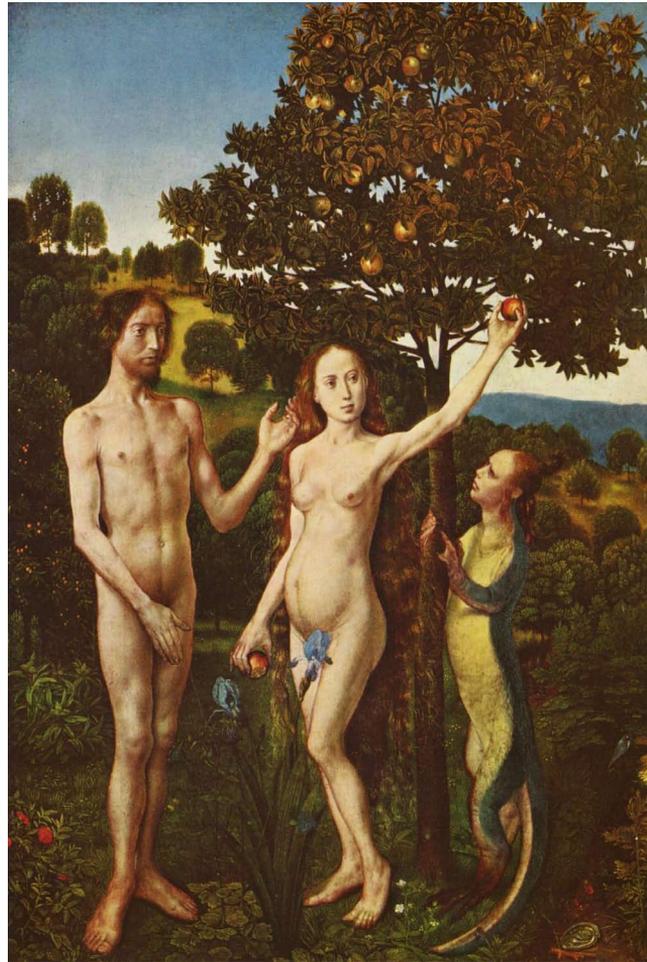
# Breaking Eve

January 21 1982. My mother's pelvic bones are too small for my head and she will need a caesarean. It's 8.08 PM; we're in the middle of a snowstorm that almost prevents my father from making it on time. When I finally arrive, at almost 5 kg, I'm declared the heaviest female baby the Montreal Royal Victoria Hospital has seen up to that date.

Human birthing is a difficult task and there is a reason for that. If there was ever an original sin, writes [Anna Barros](#), it wasn't reaching for the apple; it was reaching for it on two feet.

**R**IGHTFULLY NAMED, the vertebra upon which the skull directly rests is called the *atlas*, and stacked below it stands a whole frame designed to support the load of our globular heads. Like Atlas, our whole bodies are burdened with the weight of the world – our brains – and the demands of leading a life on two feet whilst having to balance a head whose volume is three times greater than in our greatest furry counterpart – at almost 10% of our total body mass – have forced our human bodies to completely restructure themselves from a biomechanical standpoint; and it falls to our ever-narrowing *Homo* female pelvises to labour the costs of these greedy crowns.

As a result of these architectural shuffles, 'taking a bite of the forbidden fruit' can have physically painful consequences, and assuring our species' continuity on two feet while balancing 1400 grams of folded gray matter must come at a price. The World Health Organisation estimates that there are 529 000 maternal deaths per year worldwide, only 1% of these occurring in the developed world. Obstructed labour, which relates to disproportions in the head-to-pelvis ratio (thereby making it physically impossible for the baby to pass between



the mother's pelvis) accounts for 8% of deaths, or 42 000 women, worldwide.

Perhaps not so surprisingly, it seems that our most powerful resource is the hardest to deliver; so much so that our pelvises must unhinge themselves during this event. In order for our newborn frames to pass through Eve's Ivory Gates, our large heads and shoulders must perform a specific sequence of manoeuvres involving a string of choreographed extensions and rotations, as does the female pelvis. While a gap between the pubic bones of 4–5 mm is normal, in pregnancy a total width of up to 9 mm can be seen between the two bones.

Occasionally, delivering a new life can involve not only a mere unbuttoning of the pelvis at its seam, but a more violent rupture of it. In some extreme cases, the pelvis separates itself entirely – *postpartum symphyseal diastasis* – in a condition that causes much pain but that about 45% of all pregnant women and 25% of all women

postpartum suffer from. Other times, it is the offspring who must pay the price for their 'mega-encephalised' bulges being too large for their cradles, and archaeological evidence shows that fetuses have sometimes had their limbs severed in order to extract them from their wombs.

But this epicentre of life is also the one female body part that gets plundered the most: both from the inside out and from the outside in.

For numerous evolutionary and biological reasons, wombs are prized possessions, which must be kept, protected, controlled, and forced into submission. In the most extreme of cases or situations of war where dominance is the rule, rape, mutilation, and torture of women often serves as a powerful weapon for terrorising, shaming and demoralising a people. In 2005, Doctors Without Borders admitted 1292 women who were victims of sexual violence in the Democratic Republic of Congo and as many again in the first six months of 2006; more than 3500 women and girls have been raped in the first six months of 2008, the most severely affected age group being between the ages of 19 and 45 (53.6% of the population).

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*This epicentre of life is also the one female body part that gets plundered the most: both from the inside out and from the outside in*

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Biologist Randy Thornhill and anthropologist Craig Palmer in their book *A Natural History of Rape*, state that they 'fervently believe that, just as the leopard's spots and the giraffe's elongated neck are the results of aeons of past Darwinian selection, so is rape ... There is no doubt that rape has evolutionary – and hence genetic – origins'. In support of their arguments, lies the fact that the majority of rape victims in the DRC are young women at the peak of their fertility.

But then what to make of systematic gang-rapes, mutilations, fistulas, usage of foreign objects, forced incest, rape of prepubescent women, all of which go against any procreative or evolutionary reasoning?

Given that only a small percentage of rapes that target females of reproductive age lead to pregnancy (4% in the US out of the 100 000 that occur every year, according to Dr John C Willke of the Life Issues Institute, Cincinnati), an evolutionary framework makes for a poor and overly simplistic explanation of this twisted behaviour.

According to Christine Drea and Kim Wallen, in the book *Evolution, Gender and Rape*, the payoff from rape for reproduction is very unlikely without female cooperation. Females' rather cryptic physiology imposes certain physical and postural impossibilities to a successful copulation if she is not willing. Baboon females must carry the males completely off the ground on all fours, and ringtail lemurs' vaginas point downwards. Even in orangutans, who are often cited as having successfully evolved rape as a procreative strategy, rapist males have a negligible reproductive output when compared to those who do not use force.

In what seems to be the most exemplary case of bad PR, the human Eve puts herself through the physically (and emotionally) demanding task of ovulating once every month without ever making the effort of marketing her fertility periods. This rather passive-aggressive 'I'm not telling' strategy, also greatly reduces the chances that a forced sexual encounter will be reproductively fruitful.

In the same way that our desire to avoid pregnancy decouples sex from fertility, the occurrence of sex can be decoupled from the desire to reproduce and, instead, take the shape of pure dominance, power and violence.

Whether we accept it in our genes or relegate it to our wicked souls, it seems that 200 thousand years ago, our own bipedal Eve bred her own continuity along with her own demise, as she released 6 billion Trojan horses into the world (genetically speaking), some even evolving to turn against her. It looks like our 'gateways' to earth are also gateways to hell, as each one of us brings a new bundle of mutations into the world, and with it a new possible evolutionary road; each new life being a potential branch in the tree of life, and each new woman its potential Eve.

As humanity's genesis occurs between our legs, both good and bad sprout from between them in deliverances equally as painful. But no matter how good we are, what sex we are, or if we are newborns or grown-ups, as a result of our blown-up, Machiavellian brains balanced atop an erect frame, we are, in one way or another, forever breaking Eve ...

*Anna Barros is a UCL graduate, starting a PhD in the Department of Anthropology in September*

**Website**

[www.annasbones.com](http://www.annasbones.com)

# £250 Graduate Writing Prize in memory of Craig Patterson:

## The Challenge of Sustainable City Living & the Scale of Community

**S**OPHIA IS DELIGHTED to be running a writing competition in partnership with UCL Grand Challenges, open to PhD and Masters students from any UCL department and medical students in their fourth year and above.

The winner will receive a prize of £250 and a prize of £100 will be awarded to the runner up.

The text to the right is intended as motivation for your submission but we encourage as wide a range of entries as possible so interpretations need not be overly literal. Popular articles and creative pieces of up to 2500 words are all welcome. As well as spelling out a vision of the utopian – or dystopian – future, entries could look to literature for writers' reactions to urbanisation and societal change.

Despite intending originally to publish the winner in this issue of *Sophia*, we have extended the deadline of the competition in order to publicise it properly and elicit a wider range of entries. The final deadline for submission is November 1. Because of the extended deadline, entries will

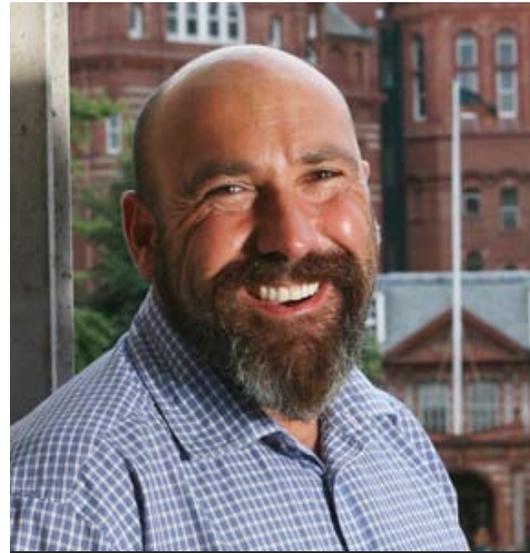
be accepted both from graduate students who will finish in Summer 2009, and newcomers in Autumn 2009.

The winning piece will be published in the November issue of *Sophia* and all entries will be released as a PDF anthology as part of the Grand Challenges initiative.

The competition is dedicated to the memory of Craig Patterson (above right), Founding Director of UCL Grand Challenges, who died in September 2008. The many members of the UCL community who had met him will have been struck by his energy, enthusiasm and pragmatic idealism. He regarded student engagement as essential to the success of the UCL Grand Challenges.

Entries should be submitted to the *Sophia* editor, Ed Long, at [editor@sophiamagazine.co.uk](mailto:editor@sophiamagazine.co.uk). Our website contains further details on the competition as well as guidelines on submitting articles to *Sophia*.

[www.sophiamagazine.co.uk](http://www.sophiamagazine.co.uk)  
[www.ucl.ac.uk/sustainable-cities](http://www.ucl.ac.uk/sustainable-cities)



THE EVOLUTION OF SOCIAL TRAITS allowing humans to cooperate was undoubtedly one of the key steps which led to the success of our species. Small communities banded together to support and defend one another and the age when an individual hunted and cared solely for themselves was over. With reproductive success came population growth, requiring innovative new social structures and settlements at higher densities than ever before. The culmination of this trend is the modern city: hugely dense in population with inhabitants playing diverse and specialised roles in order to support themselves.

Yet despite the growth of the community in size, individuals in the city environment are often more solitary and detached from their neighbours than those in smaller communities. The very size of the population affords anonymity to those who choose it, making selfish behaviour easier to indulge in unnoticed.

As governments and activists attempt to find ways to enable sustainable living in the city environment, where resources and space may have to be shared more thinly, how important are local social interactions in the development of a community committed to living within its means? Government initiatives on the use of resources are one way to change the way we live, but is it more important to find a way to cooperate with the Joneses?

