Bijlage VWO

2011

tijdvak 2

Engels

tevens oud programma

Engels

Tekstboekje

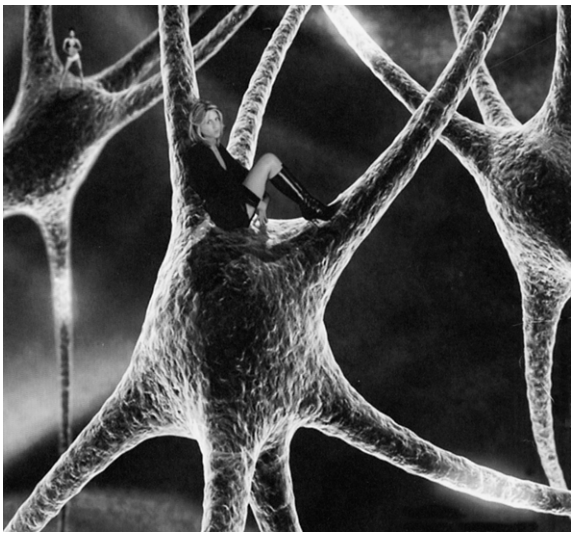
What Makes
Your Brain Cells Tick?

The work of a University of Leicester scientist, Dr Rodrigo Quian Quiroga, has been cited as one of the top in the world for 2005. His groundbreaking international research into how the brain responds to images was one of the top 100 international science stories of 2005 by *Discover* magazine and challenges the beliefs of most neuroscientists.
We all know the images that fire our imagination, whether they are of film stars, musicians, actors or a monument or feature of landscape with special associations for us.

Scientists have long thought that recognition of such concepts was the result of huge numbers of neurons (nerve cells) reacting to very basic details – such as colour of hair, width between the eyes, height – fragments of information which all combine to recognise a complex pattern or concept.

Research by a University of Leicester bioengineer, however, suggests that this is not the case and that a single neuron is able to respond to an entire concept. The visual representation of a person will be achieved in an abstract way by single neurons and not by a huge neural population, as science previously thought. To recognise a person, for example *Friends* star Jennifer Aniston, does not require a whole army of neurons to each register minute pieces of detail like pixels on a television screen. Lots of neurons will fire but just one will recognise the whole concept.

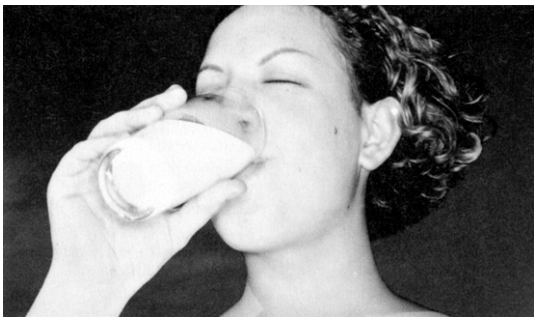
2, these 'intelligent' neurons are able to respond to the name of the film star and are fired through association. In some individuals the 'Aniston' cell fired when an individual saw an image of Lisa Kudrow – Aniston's co-star on *Friends* – because they associated these two people with one another. Associations are different for each person. For one individual a neuron might fire when they see the Eiffel Tower and the Tower of Pisa, whereas another person might associate the Eiffel Tower with the Colosseum, depending on their experiences and memories.



"Aniston" cell

This study is important in understanding how memory is created and how we gain our understanding of the world.

Graduates Review, 2006



A taste for milk

"Today more than 90 per cent of Europeans can digest milk."

MOST mammals grow out of drinking milk when they are weaned. Northern European humans don't – and the gene that allows them to digest milk may turn out to provide the first direct example of natural selection at work in modern humans.

Today more than 90 per cent of Europeans can digest milk, but Mark Thomas of University College London has found evidence that this capability only developed during the past 7000 years. For Europeans to have undergone such a rapid change, the ability to digest milk must have held a big evolutionary advantage, Thomas argues.

For the majority of people around the world, the ability to digest a sugar in milk called lactose disappears before they reach adulthood. This happens when a gene for the enzyme lactase, which breaks down the sugar, gets switched off. For people without lactase, consuming milk or milk products leads to symptoms such as bloating and diarrhoea.

To determine when northern Europeans acquired a version of the lactase gene that remains active for life, Thomas's team analysed the DNA from 55 bone samples belonging to eight Neolithic Europeans dated to between 5840 BC and 5000 BC. After extracting the DNA from the fossils, the researchers determined the sequence of the lactase gene for each of the Neolithic individuals. Surprisingly, none of them had the gene variant associated with the ability to deal with lactose that modern-day Europeans have.

Thomas concludes that the mutation for lactose tolerance arose spontaneously in Europe within the past 7000 years and that natural selection quickly ensured its spread. He points out that the ability to digest milk would have given a massive survival advantage to people living a few thousand years ago. Milk from cows is uncontaminated by parasites, making it safer to drink than stream water. It is also available year-round, unlike most crops, and provides both calcium and some vitamin D, which may be in short supply during the sunlight-starved winters of northern Europe.

The study offers a window onto past human genetic variation, says bio-archaeologist Clark Larsen of Ohio State University, Columbus.

Roxanne Khamsi •

New Scientist, 2007

DILEMMA

What are the options for green smokers?

Tobacco production is costing the earth, says Lucy Siegle, so your green credentials go up in smoke every time you light up

There is no escaping the fact that keeping 1.2bn smokers in declining health uses up a huge amount of the earth's capacity. Were this land and effort given over to growing food, some 10 to 20m of the globe's 28m malnourished inhabitants could be fed.

Naturally, the tobacco industry tries to wash away the guilt. Beginning with British American Tobacco in 2002, each of the big players (just 10 brands control a quarter of the tobacco industry) began to roll out an annual corporate social responsibility (CSR) report, as if it were producing vegan nut cutlets as opposed to cancer sticks.

Tobacco CSR reports do show progress in terms of lower input methods on farms, which increase sustainability and reduce incidences of soil erosion. They do not, however, dwell on the wider ecological impacts. Globally, one in eight trees is cut down for tobacco production; nearly 600m trees are chopped down each year to provide fuel just to dry out tobacco. Losing 51m acres of canopy for tobacco – according to recent research – equates to the production of nearly 5 per cent of all greenhouse gas emissions.

Big Tobacco has famously fled to the developing world. By 2010, 87 per cent of the world's tobacco will be grown there. Such a rapid depletion of trees in an already semi-arid climate leads to desertification, as has already happened in Uganda, where valuable arable land has been lost. It leads to the stark choice: cigarettes or food?

We eco smokers (until recently I was part of this sheepish gang) know deep down that the planet has to work overtime to sustain our habit. So we salve our guilt with supposedly greener cigarettes. Traditionally, this has meant roll-up cigarettes with a reputation for being 'cleaner' and chemical-free. Fine, except that research shows the reverse to be true. Their only eco plus point is that at least they don't leave a toxic cigarette stub to wash into watercourses.

American Spirit is the best-known and most widely available organic tobacco, best friend to those of us who can't (or won't) kick the habit but want to nurture the earth and make sure a proportion of the 33m tobacco workers aren't subjected to repeated doses of heavy pesticides. So which artisanal, Native American co-operative lovingly produces these leaves? RJ Reynolds – America's second-biggest tobacco company.

It is no surprise that the industry is falling over itself to offer organic and fairly traded tobaccos. It's an unparalleled marketing opportunity in a market which, thanks to legislation and education, was thought to be finished. Green tobacco helps to keep a deadly industry in rude health. The fact is that there is really no such thing as an ethical cigarette, and it's time to put that in your pipe and (not) smoke it.

The Observer Magazine, 2008

BOOK OF A LIFETIME

THE MARRIAGE OF CADMUS AND HARMONY

BY ROBERTO CALASSO

1 I pick up books with scepticism. It's as if I were eager to discover they were of no interest to me so that I could safely put them down again. And when *The Marriage of Cadmus and Harmony* was thrust into my hands at the Frankfurt Book Fair in 1990, I was doubly sceptical. Because at the time its title was *Le nozze di Cadmo e Armonia* and an American lady wanted me to translate it. "It's a wonderful book about the Greek gods," she enthused, "by the Italian scholar and publisher, Roberto Calasso."

2 So it was easy to say no. The book was 400-plus pages. I was already thinking I must stop translating to have more time for my own work. I was not interested in the Greek gods, and certainly not in an Italian academic's verbose and dusty take on them.

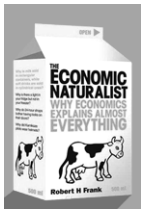
3 "Please, Tim," the lady insisted, "just give it ten pages." That plea rang a bell. It was what I used to ask when I sent in an unsolicited manuscript. It was one of the most important decisions of my career, my life in a way. Back home in Verona, I opened the first page and read, in Italian, an epigraph from Sallust: "These things never happened, but are always." Is it possible, I wondered, to write such a tense sequence in English? And then the opening paragraph, which two years later, after interminable revisions, would be thus: "On a beach in Sidon a bull was aping a lover's coo. It was Zeus. He shuddered, the way he did when a gadfly got him. But this time it was a sweet shuddering. Eros was lifting a girl onto its back: Europa."

4 It was an entirely new reading experience. After 20 pages, I had phoned New York and told them I would do it. Calasso has a remarkable capacity to dart in and out of stories, telling them in different ways with different details; there is no tedious explanation, no questioning of validity. Dazzling, even bewildering at first, a vast body of bizarre material slowly declares itself in vibrant patterns. It is as if a gallery of ruined paintings had been restored to animate life, each calling to the others, complementing and contradicting, or keeping secrets, telling lies. The rooms of the gallery are a maze and some demented attendant must be shifting the noisy canvases about so that they laugh and quarrel together in new ways. Eventually, surprise subsides into recognition: these are Europe's ancestors; with a shiver you are bound to admit that their way of seeing the world was at least as sophisticated as yours. I learned a thousand stylistic devices translating this book, and stole as many as I could for my own writing. But most of all it inspired an orgy of reading in any number of directions. Quite suddenly life and, yes, even love was different and new.

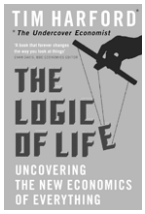
Tim Parks

The Independent, 2007

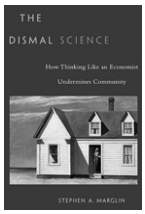
Tekst 5



The Economic Naturalist: Why Economics Explains Almost Everything
by Robert H Frank



The Logic of Life: Uncovering the New Economics of Everything
by Tim Harford



The Dismal Science: How Thinking Like an Economist Undermines Community
by Stephen A Marglin

BOOKS

Jonathan Derbyshire

1 Popular economics hit the bestseller list in 2005 with Steven D Levitt's *Freakonomics*, which sold by the bucketload and __9__ that, for the time being at least, no aspiring economic populariser would dare to tamper with. Certainly Tim Harford's *The Logic of Life* and Robert H Frank's *The Economic Naturalist* stick closely to Levitt's formula – right down to their subtitles, which promise, as *Freakonomics* did, that economics will explain "everything" or, in Frank's case, "almost everything".

2 That word "almost" might suggest a doubt or two about the explanatory power of economics, but it doesn't occur all that often in the work of those economists Harford calls the "new breed", for whom economics is about much more than graphs and calculus, the stock market and the money supply – it's nothing less than a general theory of human behaviour.

3 The emergence of popular economics is a sign of the confidence, therefore, of a discipline in rude health with imperial designs on the territory of its competitors. If how economics analyses things is as important as what it analyses, then, as Levitt recognised, "no subject, however offbeat, need be beyond its reach". The astonishing success of *Freakonomics* owed a good deal to Levitt's nose for quirky subject matter – bout-rigging among sumo wrestlers, the resemblance of Ku Klux Klansmen to estate agents or the changing fortunes of children's names – as well as his unerring ability to find evidence for some bracingly counterintuitive conclusions.

4 __11__. Harford wants to show that economic theory is not only useful but "fun". He chooses his case studies accordingly, examining, among other things, the probabilities of winning at poker. Frank's book, meanwhile, is based on an assignment he gave to students taking his introductory course in economics at Cornell University. The students were asked to pose and answer a question about observed events or behaviour, and what they came up with certainly wasn't the staple fare of Economics 101: why did kamikaze pilots wear helmets, they asked. Why is coyness often considered an attractive attribute? Why do women endure the discomfort of high heels?

5 All these phenomena __12__ what Frank calls "economic logic", the fundamental law of which is the cost-benefit principle. This says that an action ought to be taken only when the extra benefit that accrues from taking it outweighs the extra cost. So when a woman decides to squeeze her feet into

a pair of stilettos, for example, she has weighed the benefit of being "more likely to attract favourable notice", as Frank puts it, against the costs of discomfort.

6 Now one could be forgiven for thinking that this is just a dubious bit of folk-wisdom dressed up as economic theorising and the same could be said of many of Harford's "insights". Yet for all the demotic breeziness of their style, both writers have a serious purpose. In Harford's case, it is to defend a version of rational choice theory, which tries to explain human behaviour in terms of the maximisation of individual preferences or "utility". According to this model, which Harford thinks applies more or less universally, human beings respond to trade-offs or incentives: "When the costs and benefits of something change, people change their behaviour." The important point for Harford is that those costs needn't be financial.

7 Proponents of rational choice theory say that to act in accordance with the cost-benefit principle is to behave "rationally" – in a distinctive (and drastically circumscribed) sense of the word. And Harford's contention is that we're much more rational than we're inclined to think.

8 One problem with this approach is that it seems to apply better to an ideal creature called Homo economicus, whose preferences are perfectly consistent, than it does to flesh-and-blood human beings. Harford, however, dismisses Homo economicus as a "crude caricature". Rational choice theory doesn't require that we conceive of human beings, implausibly, as always thinking explicitly in terms of rational self-interest. **14** that their behaviour conforms to the model.

9 Whether our calculations are conscious or not, for rational choice theory the preferences we express are always self-interested and utility-maximising. Frank devotes a chapter to so-called behavioural economics, which disputes this view. Behavioural economists are interested in cognitive errors, especially in so-called preference reversals, where the introduction of an apparently irrelevant extra option can have a decisive effect on the preference expressed. Homo economicus would never change his preference for a roast beef sandwich over chicken salad just because the waitress remembers they've also got tuna on the menu. This may seem to imply a fairly radical revision of the rational choice framework, but, according to Stephen A Marglin in *The Dismal Science*, it's not radical enough. Marglin is a professor of economics at Harvard, but *The Dismal Science* reads like the confession of someone who has abandoned his guild.

10 Marglin argues that to think about people as always rationally calculating their self-interest is at odds with the way non-economists think about people. Non-economists know that people can sometimes act on virtuous motivation. But mainstream economics applies what Hume, nearly 300 years ago, called the "knaves principle", according to which "every man ought to be supposed a knave, and to have no other end in all his actions than private interest".

11 And you don't have to agree with Marglin's view, that the non-individualist way of life of the Amish people of Pennsylvania is the best counter-example to that, to think there's something drastically wrong with it.

Guardian Weekly, 2008

Hail Linnaeus

1 "No science in the world is more elevated, more necessary and more useful than economics." That was the view of Carl Linnaeus, a Swedish naturalist, born three centuries ago, who is better remembered for devising the system used to this day to classify living organisms.

2 Linnaeus sought to reveal what he saw as the divine order of the natural world so that it might be exploited for human benefit. He lived at a time when exploration and trade were bringing new specimens to the attention of European scientists. Those specimens, particularly the plants, were scrutinised as potential crops. At the turn of the 17th century there was no sense of how creatures were related to each other; descriptions and classifications were unsystematic. Linnaeus gave life to an organising hierarchy with kingdoms at the top and species at the bottom.

3 The system he created has proved both robust and flexible. It survived the rise of evolution. It also survived the discovery of whole categories of organism, such as bacteria, that the Swede never suspected existed. But, rather as John Maynard Keynes observed that "there is no subtler, no surer means of overturning the existing basis of society than to debauch the currency", so Linnaeus's system is being subtly debauched by over-eager taxonomists, trying to help conservation.

Carl Linnaeus

Go forth and multiply

4 As new areas are explored, the number of species naturally increases. For example, the number of species of monkey, ape and lemur gradually increased until the mid-1960s, when it levelled off. In the mid-1980s, however, it started rising again. Today there are twice as many primate species as there were then. That is not because a new wave of primatologists has emerged, pith-helmeted, from the jungle with hitherto unknown specimens. It is because a lot of established subspecies have been reclassified as species.

5 Perhaps "reclassified" is not quite the right word. "Rebranded" might be closer. Taxonomists do not always get it right first time, of course, and what looked like one species may rightly later be seen as two. But a suspiciously large number of the new species have turned up in the limited group of big, showy animals known somewhat disparagingly as "charismatic megafauna" – in other words the

species that the public, as opposed to the experts, care about.

6 One reason for this taxonomic inflation is that the idea of a species becoming extinct is easy to grasp, and thus easy to make laws about. Subspecies just do not carry as much political clout. The other is that upgrading simultaneously increases the number of rare species (by fragmenting populations) and augments the biodiversity of a piece of habitat and thus its claim for protection.

7 In the short term, this strategy helps conservationists by intensifying the perceived threat of extinction. In the long term, as every economist knows, inflation brings devaluation. Rarity is not merely determined by the number of individuals in a species, it is also about how unusual that species is. If there are only two species of elephant, African and Indian, losing one matters a lot. Subdivide the African population, as some taxonomists propose, and perceptions of scarcity may shift.

8 The trouble is that the idea of what defines a species is a lot more slippery than you might think. Since it is changes in DNA that cause species to evolve apart, looking at DNA should be a good way to divide the natural world. However, it depends which bit of DNA you look at. The standard technique says, for example, that polar bears are just brown bears that happen to be white. This is not good news for those relying on the Endangered Species Act. For a certain sort of Colorado rodent (with, alas, a nose for prime riverfront real estate) the question of whether it is "Preble's meadow jumping mouse" or a boring old meadow jumping mouse may be a matter of life or death: local property developers are on the death side. The Bahamas switched overnight from protecting their raccoons to setting up programmes to eradicate them when a look at the genetic evidence showed the animals were common Northern raccoons, not a separate species.

9 The 21st-century answer to this 18th-century riddle is that a species is what a taxonomist says it is. Evolution often fails to produce the clear divisions that human thought in general, and the law in particular, prefers to work with. It therefore behoves taxonomists to be honest. If they debase their currency, it will ultimately become valueless. Linnaeus the economist would have known that instinctively. ■

The Economist, 2008

Tekst 7

Roy Hattersley

Against both truth and logic

1 The trend is well established and beyond dispute. The number of crimes committed in Britain is falling year by year. The prison population is expanding fast and, on average, the length of sentence is increasing. Yet casual newspaper readers and television viewers are encouraged to believe the exact opposite. As a nation, Britain is approaching a condition perilously close to hysteria.

2 The media should take the major share of responsibility, but populist politicians must accept part of the blame. Last weekend we heard that John Reid, the home secretary, is considering the merits of introducing "Sarah's law", a newspaper stunt that involves the public identification of paedophiles after they have completed their prison sentences. He has, by implication, contradicted a judge for following the sentencing guidelines laid down by one of his Labour predecessors. Nobody doubts that he will allow the prison population to increase beyond the present record level. Ten years ago it was feared that it would rise to more than 50,000. This week it stood at 77,785.

3 Dr Reid may regard my criticisms as the bleating of a bleeding-heart libertarian. But my views are shared by hard-headed experts on the criminal justice system who insist, with much supporting evidence, that the populist approach to crime and punishment, far from resulting in a more law-abiding society, only makes things worse. Britain needs a politician with the courage to tell the country to calm down. Otherwise the ghastly competition in who can be toughest on crime and the causes of crime will continue, with profound damage to the fabric of civilised society.

4 Some time ago, BBC Radio's World at One broadcast two discussions on the success of custodial sentences in reducing crime. One contributor argued that the prison population should double. His proposal was unrelated to deterrence or punishment. He simply wanted to keep undesirables out of circulation. That is what Juliet Lyon, director of the Prison Reform Trust, calls using prisons "as social dustbins for petty offenders, the mentally ill and drug addicts". Forget the denial of civil rights that such a policy involves. Think only about its consequences for the prison system, described by the programme's second contributor, a former prison governor. Indefinite sentences would, he said, make the prison system unworkable. The men and women on whom they were imposed would have no incentive to cooperate with the authorities or to prepare themselves for rehabilitation.

5 The larger the number in jail, the worse the overcrowding and the smaller the prospect of release, the greater the likelihood that it corrupts even further. Difficult though the paradox may be for the hardliners to understand, a continual reduction in crime requires custodial sentences to be used only as a last resort.

6 Pandering to the popular demand to "lock them up and throw away the key" requires politicians to deny truth and defy logic. Although the scheme for potential early release is essential to the stability of the prison system, some offenders – out under licence or on parole – are bound to reoffend. Oh, for a home secretary who is prepared to say so. Ministers who are prepared to take the brutal approach to penal policy contribute to the

general brutalisation of society. Oh, for a home secretary who was not so obviously well equipped to occupy that role.

7 Dr Reid will, I know, be unimpressed by these arguments. He may, however, be more interested in the political consequences of the implication that crime is out of control. During the next three years, he is unlikely to convince the voting public that he has ended the imaginary crisis, no matter how hard he tries to outbid the Tories. The "law and order" debate will continue to contribute to the government's unpopularity. It is probably too late to convince the nation that crime is nothing like as widespread as it has been encouraged to believe. So Labour **33**.

Guardian Weekly, 2006

Tekst 8

Editorial

Vaccines for all

We need to make sure poor countries won't lose out in a flu pandemic

1 PLAGUES have always haunted humanity, but for the first time we have the technology to watch the next one emerging – and maybe even stop it. We can, but this week it's looking unlikely that we will, as our ability to track bird flu is held hostage to the fears and ideologies of a divided planet.

2 As we have reported before (*New Scientist*, 17 february, p8), Indonesia, the country where H5N1 flu is now most prevalent, is refusing to send samples of the virus from human cases to the World Health Organization. Scientists need these samples to track the virus's evolution and pass the results to vaccine makers. If they cannot do this, we are all at risk if a human pandemic emerges.

3 Indonesia's point is that it is too poor to buy any vaccine produced from its virus. So it is bargaining its lone, sad chip – the virus that is killing its people – in a bid for vaccine plants of its own. Meanwhile, rich countries and vaccine makers protest that viruses must be shared freely – until they patent the products made from them, of course.

4 So we have an impasse, and a meeting this week at the WHO in Geneva to deal with the crisis cannot resolve the profound inequality of wealth at its heart. Yet we need a solution.

5 There has been much appeal to international law. Yet neither the Convention on Biological Diversity, which gives nations sovereignty over their genetic resources, nor the WHO's International Health Regulations, which require countries to share information on diseases, applies unambiguously. What is clear is that no system based exclusively on the old idols of free markets and national sovereignty can solve this problem.

6 Some say the solution is to recognise the sovereign rights of countries over any genes on their territory – allowing them to say who can use them, and name their price. For a pathogen like H5N1 this is not a good idea. Genetic sovereignty was meant to protect organisms, such as medicinal plants, that nations had bred or developed, not to **37** a recent, deadly invader. Giving the temporary home of a germ exclusive rights to award licences to vaccine companies will most likely lead to vaccine development being concentrated in even fewer hands than it is now.

7 Yet the unfairness claimed by Indonesia is real, and we must find a way to get vaccines to poorer countries. The pandemics of TB and HIV may provide answers. Here, public-private partnerships and other hybrid organisations are forming that are not driven by large profits. They are starting to organise Research and Development globally, to develop drugs and vaccines cooperatively and to distribute them fairly.

8 The delegates in Geneva need just such fresh solutions. A good goal for this week would be to launch a process for creating them. Then everyone must start once again sharing viruses in test tubes, before we are sharing them on the wind. ●

New Scientist, 2007

Lees bij de volgende tekst eerst de vraag voordat je de tekst zelf raadpleegt.

Tekst 9

Legal Notice

No. 7503 of 2006
IN THE HIGH COURT OF JUSTICE CHANCERY DIVISION COMPANIES COURT IN THE MATTER OF KINGSLAND SHOPPING CENTRE LIMITED
and
IN THE MATTER OF THE COMPANIES ACT 1985

NOTICE IS HEREBY GIVEN that a Petition was presented to Her Majesty's High Court of Justice, Chancery Division on 16 October 2006 for the confirmation of the reduction of the share capital of the above-named Company by £8,556,844.

AND NOTICE IS FURTHER GIVEN that the said Petition is directed to be heard before the Companies Court Registrar at the Royal Courts of Justice, Strand, London WC2A 2LL on 8 November 2006.

Any creditor or shareholder of the said Company desiring to oppose the making of an Order for the confirmation of the said reduction of share capital should appear at the time of the hearing in person or by Counsel for that purpose.

A copy of the said Petition will be furnished to any person requiring the same by the under-mentioned Solicitors on payment of the regulated charge for the same.

DATED the 24th day of October 2006
PricewaterhouseCoopers Legal LLP
1 Embankment Place,
London WC2N 6DX
Ref: DEV005.0005/AH
Solicitors for the Company