

PTE Summarize Written Text questions

1

In 1953 B.F. Skinner visited his daughter's maths class. The Harvard psychologist found every pupil learning the same topic in the same way at the same speed. A few days later he built his first "teaching machine", which let children tackle questions at their own pace. By the mid-1960s similar gizmos were being flogged by door-to door salesmen. Within a few years, though, enthusiasm for them had fizzled out. Since then education technology (edtech) has repeated the cycle of hype and flop, even as computers have reshaped almost every other part of life. One reason is the conservatism of teachers and their unions. But another is that the brain-stretching potential of edtech has remained unproven.

Today, however, Skinner's heirs are forcing the sceptics to think again (see article). Backed by billionaire techies such as Mark Zuckerberg and Bill Gates, schools around the world are using new software to "personalize" learning. This could help hundreds of millions of children stuck in dismal classes—but only if edtech boosters can resist the temptation to revive harmful ideas about how children learn. To succeed, edtech must be at the service of teaching, not the other way around. The conventional model of schooling emerged in Prussia in the 18th century. Alternatives have so far failed to teach as many children as efficiently. Classrooms, hierarchical year-groups, standardized curriculums and fixed timetables are still the norm for most of the world's nearly 1.5bn schoolchildren.

2

Diasporas – communities which live outside, but maintain links with, their homelands are getting larger, thicker and stronger. They are the human face of globalization. Diaspora consciousness is on the rise: Diasporas are becoming more interested in their origins, and organising themselves more effectively; homelands are revising their opinions of their diasporas as the stigma attached to emigration declines, and stepping up their engagement efforts; meanwhile, host countries are witnessing more assertive diasporic groups within their own national communities, worrying about fifth columns and foreign lobbies, and suffering outbreaks of ‘diasporaphobia’.

This trend is the result of five factors, all of them connected with globalisation: the growth in international migration; the revolution in transport and communications technology, which is quickening the pace of diasporans’ interactions with their homelands; a reaction against global homogenised culture, which is leading people to rethink their identities; the end of the Cold War, which increased the salience of ethnicity and nationalism and created new space in which diasporas can operate;

And policy changes by national governments on issues such as dual citizenship and multiculturalism, which are enabling people to lead transnational lives. Diasporas such as those attaching to China, India, Russia and Mexico are already big, but they will continue to grow; the migration flows which feed them are likely to widen and quicken in the future.

3

It's very easy to forget about what's in the ground beneath our feet and why it's so important to protect it. One tablespoon of soil contains more organisms than there are people on Earth; billions of bacteria, fungi and other microorganisms combine with minerals, water, air and organic matter to create a living system that supports plants and, in turn, all life. Healthy soil can store as much as 3,750 tons of water per hectare, reducing the risk of flooding, and the International Panel on Climate Change (IPCC) has said that 89% of all agricultural emissions could be mitigated if we improved the health of our soil.

Good soil management also increases disease resistance in livestock and ultimately drives profits for farmers – yet soil and its impact on the health of our animals has, over recent decades, been one of the most neglected links in UK agriculture. Over the last 50 years' agriculture has become increasingly dependent on chemical fertilizers, with applications today around 10 times higher than in the 1950s. Farmers often think the chemical fertilizer NPK (nitrogen, phosphorous and potassium) provides all the nutrition a plant requires, but it also has a detrimental effect on the long-term health of the land: research suggests there are fewer than 100 harvests left in many of the world's soils.

4

The advantages and disadvantages of solar power compared to other forms of renewable energy have been greatly debated. While obviously superior to some forms of energy, solar power's high cost and efficiency dependent on geography have limited its appeal. However, a large number of advantages also merit further development and even possible adaptation for residences. Solar energy remains popular because it is both a renewable and clean source of energy. These advantages along with the hope that eventually nations can use solar power to decrease global warming ensure its popularity. Renewable Solar energy is a true renewable resource. All areas of the world have the ability to collect some amount of solar power and solar power is available for collection each day. Clean Solar energy is non-polluting. It does not create greenhouse gases, such as oil based energy does, nor does it create waste that must be stored, such as nuclear energy.

It is also far more quiet to create and harness, drastically reducing the noise pollution required to convert energy to a useful form. Residential size solar energy systems also have very little impact on the surrounding environment, in contrast with other renewable energy sources such as wind and hydro electric power. Low Maintenance Solar panels have no moving parts and require very little maintenance beyond regular cleaning. Without moving parts to break and replace, after the initial costs of installing the panels, maintenance and repair costs are very reasonable.

5

In a study in the current issue of the journal PLoS One, a team of scientists in Germany showed experts and novices simple geometric objects and simple chess positions and asked the subjects to identify them. Reaction times were measured and brain activity was monitored using functional M.R.I. scans. On the identification of the geometric objects, the subjects performed the same, showing that the chess experts had no special visualization skills. When the subjects were shown the chess positions, the experts identified them faster. Focusing on an element of an earlier study on pattern and object recognition by chess experts, the researchers had expected to see parts of the left hemispheres of the experts' brains — which are involved in object recognition — react more quickly than those of the novices when they performed the chess tasks. But the reaction times were the same. What set the experts apart was that parts of their right brain hemispheres — which are more involved in pattern recognition — also lit up with activity.

The experts were processing the information in two places at once. The researchers also found that when the subjects were shown the chess diagrams, the novices looked directly at the pieces to recognize them, while the experts looked on the middle of the boards and took everything in with their peripheral vision.

6

To understand the final reason why the news marketplace of ideas dominated by television is so different from the one that emerged in the world dominated by the printing press, it is important to distinguish the quality of vividness experienced by television viewers from the “vividness” experienced by readers. I believe that the vividness experienced in the reading of words is automatically modulated by the constant activation of the reasoning centers of the brain that are used in the process of concreting the representation of reality the author has intended. By contrast, the visceral vividness portrayed on television has the capacity to trigger instinctual responses similar to those triggered by reality itself—and without being modulated by logic, reason, and reflective thought.

The simulation of reality accomplished in the television medium is so astonishingly vivid and compelling compared with the representations of reality conveyed by printed words that it signifies much more than an incremental change in the way people consume information. Books also convey compelling and vivid representations of reality, of course. But the reader actively participates in the conjuring of the reality the book’s author is attempting to depict. Moreover, the parts of the human brain that are central to the reasoning process are continually activated by the very act of reading printed words: Words are composed of abstract symbols—letters— that have no intrinsic meaning themselves until they are strung together into recognizable sequences.

Television, by contrast, presents to its viewers a much more fully formed representation of reality—without requiring the creative collaboration that words have always demanded.

7

You used to think that being green was a luxury for your company, but climate change has made you realize that you can no longer ignore it. The buzz is about becoming carbon-neutral, but where do you start? Consider your drivers. Do you want to become carbon-neutral for marketing reasons, for financial reasons or to help save the planet? Simon Armitage of the Carbon Neutral Company believes: "Your drivers will help you tailor your carbon-reduction program and determine key performance indicators."

This will help build a case for going carbon-neutral. First, measure your carbon footprint, or get a specialist to do it for you. That primarily means taking account of your energy usage and emissions caused through travel. Before you begin, think about whether you're collecting the right data and whether it's readily accessible. When implementing any energy reduction measures, ensure you engage with your staff. "It's much better if your people decide for themselves when it's sensible for them to travel," says Armitage. You'll also need them to participate in switching off the lights and other energy-saving measures. Set targets and show it's not a one-off exercise.



8

Many insecurities, fears, and doubts stem from lack of understanding or lack of knowledge about something. The more you understand and know about a situation, the more comfortable you will be and thus the less power your shyness will have over you. Let's take for example the subject of public speaking. This is an activity that terrifies most people half to death, but only because most people don't have much knowledge about it. If you do some research and investigation, you'll come to learn that it's perfectly natural to be terrified of public speaking, and that almost every single person has the same fears and insecurities that you do. When you take it further and ask yourself why you are so terrified of this, you'll come to learn that you are scared of being judged, or of being laughed at.

From there, you can go and read and learn about people who are good at public speaking—learn their tips and strategies. This way you are much more prepared because your knowledge on the subject is vast. As a result of this, your confidence will already be much higher than before, which might allow you to attempt public speaking when you join a club like Toastmasters. As you practice more, you will naturally become even more confident. This rule applies to any area where you feel insecure. Read and research as much about the topic as possible. This will help increase your confidence enough to give the activity a try to see if you might be able to become better at it. And that initial confidence to take action is all you need to get the ball rolling and overcome your shyness.

9

Research shows that when people work with a positive mind-set, performance on nearly every level — productivity, creativity, engagement — improves. Yet happiness is perhaps the most misunderstood driver of performance. For one, most people believe that success precedes happiness. “Once I get a promotion, I’ll be happy,” they think. Or, “Once I hit my sales target, I’ll feel great.” But because success is a moving target — as soon as you hit your target, you raise it again—the happiness that results from success is fleeting.

In fact, it works the other way around: People who cultivate a positive mind-set perform better in the face of challenge. I call this the “happiness advantage” — every business outcome shows improvement when the brain is positive. I’ve observed this effect in my role as a researcher and lecturer in 48 countries on the connection between employee happiness and success. And I’m not alone: In a meta-analysis of 225 academic studies, researchers Sonja Lyubomirsky, Laura King, and Ed Diener found strong evidence of directional causality between life satisfaction and successful business outcomes.

Another common misconception is that our genetics, our environment, or a combination of the two determines how happy we are. To be sure, both factors have an impact. But one’s general sense of well-being is surprisingly malleable. The habits you cultivate, the way you interact with coworkers, how you think about stress — all these can be managed to increase your happiness and your chances of success.

10

The National Oceanography Center (NOC) is engaged in research into the potential risks and benefits of exploiting deep-sea mineral resources, some of which are essential for low-carbon technology, as well as using ocean robots to estimate the environmental impact of these potential deep-sea mining activities.

Late last year the NOC led an expedition on the RRS James Cook that found enough of the scarce element Tellurium present in the crust of a submerged volcano that, if it were all to be used in the production of solar PV panels, could provide two-thirds of the UK's annual electricity supply. Recently, the NOC also led an international study demonstrating deep-sea nodule mining will cause long-lasting damage to deep-sea life, lasting at least for decades.

These nodules are potato-sized rocks containing high levels of metals, including copper, manganese and nickel. They grow very slowly on the sea-bed, over millions of years. Although no commercial operations exist to extract these resources, many are planned. Professor Edward Hill, Executive Director at the NOC commented, "By 2050 there will be nine billion people on earth and attention is increasingly turning to the ocean, particularly the deep ocean, for food, clean supplies of energy and strategic minerals. The NOC is undertaking research related to many aspects and perspectives involved in exploiting ocean resources. This research is aimed at informing with sound scientific evidence the decisions that will need to be taken in the future, as people increasingly turn to the oceans to address some of society's greatest challenges."

11

A day would come, Percy Shelley predicted in 1813, when "the monopolizing eater of animal flesh would no longer destroy his constitution by eating an acre at a meal". He explained: "The quantity of nutritious vegetable matter consumed in fattening the carcass of an ox would afford 10 times the sustenance if gathered immediately from the bosom of the earth." Two hundred years later, mainstream agronomists and dietitians have caught up with the poet.

A growing scientific consensus agrees that feeding cereals and beans to animals is an inefficient and extravagant way to produce human food, that there is a limited amount of grazing land, that the world will be hard-pressed to supply a predicted population of 9 billion people with a diet as rich in meat as the industrialized world currently enjoys, and that it's not a very healthy diet anyway. On top of this, livestock contribute significantly towards global warming, generating 14.5% of all manmade greenhouse gas emissions, according to one much-quoted estimate from the United Nations. Now that the problem has been identified, the challenge is to persuade people in wealthy countries to eat less meat. That might seem a tall order, but governments have successfully persuaded people to quit smoking through a combination of public information, regulation and taxation.

12

Humans love to complain to each other. It helps us feel less alone. Think about what happens when a family member or friend is going through a tough time; they call up someone who will listen to their tale of woe. Unfortunately, negative bonding is the default for many groups.

In some families complaining is the only way to get attention. When one person says, I had a bad day; the other person has to top it. "You think you had a tough day, I had to do three TPS reports!" The same thing happens at work and social settings. "Your child didn't sleep through the night until 6 months? Mine was a full year old before she went over six hours." It's a race to the bottom, the worst situation wins. In *Bitching is Bonding, A Guide To Mutual Complaint*, Irene S. Levine, Ph.D., a professor of psychiatry at the NYU Langone School of Medicine says, "the reason these conversations feel good is because we feel understood."

People raised in negative environments learn early on, being positive gets you thrown out of the club. When family dinner is a complaint fest, you're not going to risk alienation saying, "Wow, I had an awesome day, don't you just love life?" Translate this into a work setting, people, often unconsciously, believe being positive keeps you out of the cool club. When negativity provides bonding, humans are reluctant to abandon the behavior that brings them comfort.

13

Ecology is the study of interactions of organisms among themselves and with their environment. It seeks to understand patterns in nature (e.g., the spatial and temporal distribution of organisms) and the processes governing those patterns. Climatology is the study of the physical state of the atmosphere – its instantaneous state or weather, its seasonal-to-interannual variability, its long-term average condition or climate, and how climate changes over time. These two fields of scientific study are distinctly different. Ecology is a discipline within the biological sciences and has as its core the principle of natural selection. Climatology is a discipline within the geophysical sciences based on applied physics and fluid dynamics. Both, however, share a common history.

The origin of these sciences is attributed to Aristotle and Theophrastus and their books *Meteorological* and *Enquiry into Plants*, respectively, but their modern beginnings trace back to natural history and plant geography. Seventeenth, eighteenth, and nineteenth century naturalists and geographers saw changes in vegetation as they explored new regions and laid the foundation for the development of ecology and climatology as they sought explanations for these geographic patterns. Alexander von Humboldt, in the early 1800s, observed that widely separated regions have structurally and functionally similar vegetation if their climates are similar. Alphonse de Candolle hypothesized that latitudinal zones of tropical, temperate, and arctic vegetation are caused by temperature and in 1874 proposed formal vegetation zones with associated temperature limits.

14

If you've been buying sports gels to keep you going during your workout, you might want to try honey instead. According to findings presented today at the annual Experimental Biology conference, honey delivers a significant performance boost to athletes during strenuous exercise. "Numerous studies have singled out carbohydrates as a critical nutrient in endurance exercise," says principal investigator Richard Kreider of the University of Memphis Exercise and Sport Nutrition Laboratory. "Most of the studies to date have shown supplementation with glucose to provide the extra staying power.

We were pleased to find that honey, a 'cocktail' of various natural sugars, performed just as well."The team let nine competitive male cyclists cycle for 64 kilometers each week for three weeks, feeding them honey, dextrose gel or a flavored, calorie-free placebo. Participants received 15 grams of that supplement along with 250 milliliters of water before they raced and then every 16 kilometers while cycling. Both the honey and the dextrose gel led to better times and more cycling power among the athletes, as compared with the placebo effects. While the dextrose gel slightly outperformed honey, the difference was negligible, leading the researchers to conclude that honey can be a natural and effective carbohydrate source for endurance athletes.

15

What do great managers actually do? In my research, beginning with a survey of 80,000 managers conducted by the Gallup Organization and continuing during the past two years with in-depth studies of a few top performers, I've found that while there are as many styles of management as there are managers, there is one quality that sets truly great managers apart from the rest: They discover what is unique about each person and then capitalize on it. Average managers play checkers, while great managers play chess. The difference?

In checkers, all the pieces are uniform and move in the same way; they are interchangeable. You need to plan and coordinate their movements, certainly, but they all move at the same pace, on parallel paths. In chess, each type of piece moves in a different way, and you can't play if you don't know how each piece moves. More important, you won't win if you don't think carefully about how you move the pieces. Great managers know and value the unique abilities and even the eccentricities of their employees, and they learn how best to integrate them into a coordinated plan of attack.

This is the exact opposite of what great leaders do. Great leaders discover what is universal and capitalize on it. Their job is to rally people toward a better future. Leaders can succeed in this only when they can cut through differences of race, sex, age, nationality, and personality and, using stories and celebrating heroes, tap into those very few needs we all share. The job of a manager, meanwhile, is to turn one person's particular talent into performance. Managers will succeed only when they can identify and deploy the differences among people, challenging each employee to excel in his or her own way. This doesn't mean a leader can't be a manager or vice versa. But to excel at one or both, you must be aware of the very different skills each role requires.

16

The area that is now South Africa has been inhabited by humans for millennia. The San, the original inhabitants of this land, were migratory people who lived in small groups of about 15 to 20 people. They survived by fishing and hunting and by gathering roots and other wild foods. They did not build permanent dwellings but used rock shelters as temporary dwellings. Around 2,000 years ago Khoikhoi pastoralists migrated to the coast. In the eastern part of present-day South Africa, iron-working societies date from about 300 AD. The Sotho- Tswana and Nguni peoples arrived in this region around 1,200 AD.

They lived by agriculture and stock farming, mined gold, copper and tin and hunted for ivory and built stone-walled towns. Over the centuries, these societies had diverse contacts with the Khoisan. Strife between the San and the Khoikhoi developed over competition for game; eventually the Khoikhoi became dominant. These peoples lived in the western part of present-day South Africa and are known collectively as the Khoisan.

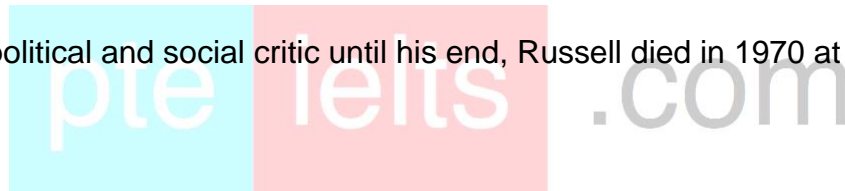


17

Bertrand Russell was arguably the greatest philosopher of the 20th century and the greatest logician since Aristotle. Analytic philosophy, the dominant philosophy of the twentieth century, owes its existence more to Russell than to any other philosopher. And the system of logic developed by Russell and A.N. Whitehead, based on earlier work by Dedekind, Cantor, Frege, and Peano, broke logic out of its Aristotelian straitjacket. He was also one of the century's leading public intellectuals and won the Nobel Prize for Literature in 1950 "in recognition of his varied and significant writings in which he champions humanitarian ideals and freedom of thought."

He was married 4 times and had 3 children. With Dora Russell, he founded the experimental Beacon Hill School. He knew or worked with many of the most prominent figures in late 19th and 20th century philosophy, mathematics, science, literature, and politics.

Active as a political and social critic until his end, Russell died in 1970 at the age of 97.



18

Disabled people were among the early adopters of personal computers. They were quick to appreciate that word processing programs and printers gave them freedom from dependence on others to read and write for them. Some of these disabled early adopters became very knowledgeable about what could be achieved and used their knowledge to become independent students at a high level. They also gained the confidence to ask that providers of education make adjustments so that disabled students could make better use of course software and the web, rather than just word processing.

For some disability groups, information in electronic format (whether computer-based or web-based) can be more accessible than printed information. For example, people who have limited mobility or limited manual skills can find it difficult to obtain or hold printed material; visually impaired people can find it difficult or impossible to read print, but both these groups can be enabled to use a computer and, therefore, access the information electronically. Online communication can enable disabled students to communicate with their peers on an equal basis.

For example, a deaf student or a student with Asperger's syndrome may find it difficult to interact in a face-to-face tutorial, but may have less difficulty interacting when using a text conferencing system in which everyone types and reads text. In addition, people's disabilities are not necessarily visible in online communication systems; so disabled people do not have to declare their disability and are not perceived as being different.

19

Over the years, language teachers have alternated between favoring teaching approaches that focus primarily on language use and those that focus on language forms or analysis. The alternation has been due to a fundamental disagreement concerning whether one learns to communicate in a second language by communicating in that language (such as in an immersion experience) or whether one learns to communicate in a second language by learning the lexicogrammar – the words and grammatical structures – of the target language. In other words, the argument has been about two different means of achieving the same end.

As with any enduring controversy, the matter is not easily resolved. For one thing, there is evidence to support both points of view. It is not uncommon to find learners who, for whatever reason, find themselves in a new country or a new region of their own country, who need to learn a new language, and who do so without the benefit of formal instruction. If they are postpubescent, they may well retain an accent of some kind, but they can pick up enough language to satisfy their communicative needs. In fact, some are natural acquirers who become highly proficient in this manner. In contrast, there are learners whose entire exposure to the new language comes in the form of classroom instruction in lexicogrammar. Yet they too achieve a measure of communicative proficiency, and certain of these learners become highly proficient as well.

What we can infer from this is that humans are amazingly versatile learners and that some people have a natural aptitude for acquiring languages and will succeed no matter what the circumstances.

20

An international team of scientists, including a physiologist from The University of Manchester, will head to the largest island in the world later this month to investigate the Greenland shark – believed to be the longest-lived vertebrate animal. Dr Holly Shiels, who is also a trustee of the Physiological Society, will be the only UK-based scientist on the expedition aboard the research vessel Sanna commissioned by the Greenland government.

The purpose of the mission is to understand more about the Greenland shark, a top predator in the Arctic, which lives for more than 272 years - possibly more than 400. This extreme age was only revealed by scientists from Copenhagen last year and published in the journal Science. Little else is known about how the shark survives in the deep seas around the Arctic Circle. It is both a hunter and a scavenger and has been seen to feed on seals and been found with the remains of polar bears and whales in its stomach. It is also one of the largest species of shark – growing to about five-and-a-half metres, just a bit smaller than the great white.

However, more information is required to ensure the species is adequately protected, as Dr Shiels explained: "Greenland sharks are classified as data deficient," she said. "This means that we don't know enough to put measures in place to protect them from over-fishing, pollution or climate change. This expedition has a broad range of expertise which means that we'll be able to take full advantage of any sharks that we discover."

21

Brand loyalty exists when consumers repeat-purchase your brand rather than swapping and switching between brands. It is widely agreed that it is far more expensive to have to find a new customer than to keep existing ones happy, so brand loyalty is crucial for achieving high-profit margins. For charities, it is important to set a marketing objective of improving brand loyalty. If existing donors can be persuaded to set up a direct debit to the charity, its cash flow will improve significantly.

To enhance, or reposition a brand's image? Although some brands stay fresh for generations (Marmite is over 100 years old) others become jaded due to changes in consumer tastes and lifestyles. At this point, the firms need to refresh the brand image to keep the products relevant to the target market. A clear objective must be set. For instance: what brand attributes do we want to create? What do we want the brand to stand for? Repositioning. This occurs when a firm aims to a change a brand's image, so that the brand appeals to a new target market. Twelve years into its life cycle, McVitie's decided to reposition its Hobnobs biscuit brand. Hobnobs had been positioned as a homely, quite healthy biscuit for middle-aged consumers.

Research pointed McVitie's in a new direction: younger, more male, and less dull. So new packaging was designed and then launched in conjunction with a new, brighter advertising campaign. In 2013, Hobnobs sales were worth 36 million pounds, 9 percent up on the previous year.

22

Working nine to five for a single employer bears little resemblance to the way a substantial share of the workforce makes a living today. Millions of people assemble various income streams and work independently, rather than in structured payroll jobs. This is hardly a new phenomenon, yet it has never been well measured in official statistics—and the resulting data gaps prevent a clear view of a large share of labor-market activity.

To better understand the independent workforce and what motivates the people who participate in it, the McKinsey Global Institute surveyed some 8,000 respondents across Europe and the United States. We asked about their income in the past 12 months—encompassing primary work, as well as any other income-generating activities—and about their professional satisfaction and aspirations for work in the future.

The resulting report, *Independent work: Choice, necessity, and the gig economy*, finds that up to 162 million people in Europe and the United States—or 20 to 30 percent of the working-age population—engage in some form of independent work. While demographically diverse, independent workers largely fit into four segments (exhibit): free agents, who actively choose independent work and derive their primary income from it; casual earners, who use independent work for supplemental income and do so by choice; reluctants, who make their primary living from independent work but would prefer traditional jobs; and the financially strapped, who do supplemental independent work out of necessity.

23

The 1920's movie goers experience was largely dominated by silent movies but saw the introduction of synchronized sound. In the 1920's movie stars were really stars – with huge salaries, the fashions and activities of the Hollywood greats echoed around the world and 100,000 people would gather in cities all over the world, including such diverse cities as London and Moscow, to greet Mary Pickford and Douglas Fairbanks when they toured of Europe.

Early silent movies were often accompanied by live piano or organ music and provided enormous entertainment value to audiences captivated by the experience of watching moving pictures on the silver screen. Although there had been previous attempts to introduce sound, it wasn't until 1923 that a synchronized sound track was photographically recorded and printed on to the side of the strip of motion picture film and made it on to a commercially distributed movie. It would still be seven long years before talking pictures gained total supremacy and finally replaced the silent film era.

The first movie theatres were called Nickelodeons, and were very basic compared the luxurious picture palaces that followed but what an aura of excitement, of laughter, fun and tears surrounded them! Before the introduction of movie soundtracks, movies were often accompanied by scripted music from a piano.

24

One of Guinness World Records' more unusual awards was presented at the National Maritime Museum yesterday. After a 100-day trial, the timepiece known as Clock B – which had been sealed in a clear plastic box to prevent tampering – was officially declared, by Guinness, to be the world's "most accurate mechanical clock with a pendulum swinging in free air". It was an intriguing enough award. But what is really astonishing is that the clock was designed more than 250 years ago by a man who was derided at the time for "an incoherence and absurdity that was little short of the symptoms of insanity", and whose plans for the clock lay ignored for two centuries.

The derision was poured on John Harrison, the British clockmaker whose marine chronometers had revolutionized seafaring in the 18th century (and who was the subject of Longitude by Dava Sobel). His subsequent claim – that he would go on to make a pendulum timepiece that was accurate to within a second over a 100-day period – triggered widespread ridicule. The task was simply impossible, it was declared. But now the last laugh lies with Harrison. At a conference, Harrison Decoded: Towards a Perfect Pendulum Clock, held at Greenwich yesterday, observatory scientists revealed that a clock that had been built to the clockmaker's exact specifications had run for 100 days during official tests and had lost only five-eighths of a second in that period.

25

When Tim Berners-Lee invented the World Wide Web, he surely didn't anticipate that children would end up becoming some of its main users. Most start using the internet at the average age of three – and as recent research shows, children now spend more time playing and socializing online than watching television programs. Given this change in habits, it is not surprising that a recent House of Lords report has raised online safety and behavior as an important issue. The report said that for children, learning to survive in a world dominated by the internet should be as important as reading and writing.

The House of Lords Communications Committee also warned that children should not be leaving school without “a well-rounded understanding of the digital world”. It also suggested that the government should think about implementing new legal requirements and a code of conduct companies would have to adhere to, which would help to bring the internet up to “child friendly standards”. Of course, trying to rectify this lack of child-centered design is not an easy task, but one that requires the cooperation and goodwill of many sectors. It will need to involve consultation with technology, education, legal and policy experts. And it would also be a good idea to make children and young people part of the process.

26

Many human activities are responsible for the production of greenhouse gases. Generating electricity is the single largest source of CO₂ emissions in the United States, followed by transportation. Negative externalities are created by individuals that engage in more than the economically efficient amount of an activity, such as driving. Because the driver enjoys all of the benefits that come along with driving and only suffer part of the cost, they do not put a limit on how far or how often they should drive.

The only way to get individuals to participate in reducing greenhouse gases is by having them bear all the costs of their actions. This is difficult because the costs are so little compared to the benefit, so why give up something that benefits more than sets you back. Two different methods are being proposed in order to help humans take into consideration the costs of their actions in order to reduce production of greenhouse gases. The methods proposed are government regulation and taxation. Unless the government sets regulations and taxes, the individual level of involvement will be very low and unless many people participate, the amount of greenhouse gases will not be significantly reduced.

27

Most of the time when I embark on such an investigation, it quickly becomes clear that matters are much more complicated and ambiguous — several shades grayer — than I thought going in. Not this time. The deeper I delved into the confused and confusing thicket of nutritional science, sorting through the long-running fats versus carb wars, the fiber skirmishes and the raging dietary supplement debates, the simpler the picture gradually became. I learned that in fact science knows a lot less about nutrition than you would expect — that in fact nutrition science is, to put it charitably, a very young science.

It's still trying to figure out exactly what happens in your body when you sip a soda, or what is going on deep in the soul of a carrot to make it so good for you, or why in the world you have so many neurons — brain cells! — in your stomach, of all places. It's a fascinating subject, and someday the field may produce definitive answers to the nutritional questions that concern us, but — as nutritionists themselves will tell you — they're not there yet. Not even close. Nutrition science, which after all only got started less than two hundred years ago, is today approximately where surgery was in the year 1650 — very promising, and very interesting to watch, but are you ready to let them operate on you? I think I'll wait awhile.

28

The worldwide population of wild giant pandas increased by 268 over the last decade according to a new survey conducted by the government of China. The increase in population brings the total number of wild giant pandas to 1,864.

The population increase represents 16.8% rise compared to the last panda survey in 2003. Wild giant pandas, a global symbol of wildlife conservation, are found only in China's Sichuan, Shaanxi and Gansu provinces.

According to the report, formally known as the Fourth National Giant Panda Survey, the geographic range of pandas throughout China also increased. The total area inhabited by wild giant pandas in China now equals 2,577,000 hectares, an expansion of 11.8% since 2003.

These results are a testament to the conservation achievements of the Chinese government," said Xiaohai Liu, executive director of programmes, WWF-China. "A lot of good work is being done around wild giant panda conservation, and the government has done well to integrate these efforts and partner with conservation organizations including WWF."

The report, the fourth in a series of decadal (10 year) surveys conducted by the State Forestry Administration of China, began in 2011 with financial and technical support from WWF.

Much of the success in increasing the panda population comes as a result of conservation policies implemented by the Chinese government, including the Natural Forest Protection Project and Grain for Green.

The report found that 1,246 wild giant pandas live within nature reserves, accounting for 66.8% of the total wild population, and the habitat within nature reserves accounts for 53.8% of the total habitat area. There are currently 67 panda nature reserves in China, an increase of 27 since the last report.

"WWF" is pleased to witness this significant conservation achievement – the increase of both the wild giant panda population size and habitat area over last ten years, said Lie. "The survey result demonstrates the effectiveness of nature reserves in boosting wild giant panda numbers."

29

Broadly speaking, there are two different ways of thinking about modern art, or two different versions of the story. One way is to view art as something that can be practiced (And thought of) as an activity radically separate from everyday life or worldly concerns. From this point of view, art is said to be “autonomous” from society – that is, it is believed to be self-sustaining and self-referring. One particularly influential version of this story suggests that modern art should be viewed as a process by which features extraneous to a particular branch of art would be progressively eliminated, and painters or sculptors would come to concentrate on problems specific to their domain.

Another way of thinking about modern art is to view it as responding to the modern world, and to see modern artists immersing themselves in the conflicts and challenges of society. That is to say, some modern artists sought ways of conveying the changing experiences generated in Europe by the twin processes of commercialization (the commodification of everyday life) and urbanization. From this point of view, modern art is a way of reflecting on the transformation that created what we call, in a sort of shorthand, “modernity”.

30

The origins of writing are largely unclear. Writing systems were created independently all over the world. The earliest we know of were developed in the Middle East around 5,000 years ago. But other scripts were invented in India, Egypt, China and Central America. It has been suggested that some of these systems may have influenced others, but this has not been proved.

These forms of writing look completely different, follow different rules and are often read in completely different ways. But they all perform the same basic function. They are all a visual means of recording language.

Knowledge of some early scripts invented in certain regions was picked up by peoples living in surrounding areas. They would then adopt and adapt them to their own needs and language. Chinese, for example, was adopted in Japan and Korea, though it had to be altered to apply to the languages spoken there.



31

Many people who have written on the subject of allowances say it is not a good idea to pay your child for work around the home. These jobs are a normal part of family life. Paying children to do extra work around the house, however, can be useful. It can even provide an understanding of how a business works. Allowances give children a chance to experience the things they can do with money. They can share it in the form of gifts or giving to a good cause.

They can spend it by buying things they want. Or they can save and maybe even invest it. Saving helps children understand that costly goals require sacrifice: you have to cut costs and plan for the future. Requiring children to save part of their allowance can also open the door to future saving and investing. Many banks offer services to help children and teenagers learn about personal finance. A savings account is an excellent way to learn about the power of compound interest. Interest rates on savings can be very low these days. But compounding works by paying interest on interest. So, for example, one dollar invested at two percent interest will earn two cents in the first year. The second year, the money will earn two percent of one dollar and two cents, and so on. That may not seem like a lot. But over time it adds up.

32

In such an environment, warfare is no longer purely directed against the military potential of adversarial states. It is rather directed at infiltrating all areas of their societies and to threaten their existences. The comparatively easy access to weapons of mass destruction, in particular relatively low-cost biological agents, is of key concern. Both governmental and non-governmental actors prefer to use force in a way that can be characterized as “unconventional” or also as “small wars”. War waged according to conventions is an interstate phenomenon.

The “small war” is the archetype of war, in which the protagonists acknowledge no rules and permanently try to violate what conventions do exist. The protagonists of the “small war” observe neither international standards nor arms control agreements. They make use of territories where they do not have to fear any sanctions because there is no functioning state to assume charge of such sanctions or because the state in question is too weak to impose such sanction. This type of war does not provide for any warning time. It challenges not only the external security of the nation states and international community, but also their internal safety.

33

Americans in the mid-nineteenth century could point to plenty of examples, real as well as mythical, of self-made men who by dint of "industry, prudence, perseverance, and good economy" had risen "to competence, and then to affluence." With the election of Abraham Lincoln, they could point to one who had risen from a log cabin to the White House. "I am not ashamed to confess that twenty-five years ago I was a hired labourer, mauling rails, at work on a flat-boat-just what might happen to any poor man's son!" Lincoln told an audience at New Haven in 1860. But in the free states, a man knew that "he can better his condition..."

there is no such thing as a freeman being fatally fixed for life, in the condition of a hired labourer." "Wage slave" was a contradiction in terms, said Lincoln." The man who laboured for another last year, this year labours for himself, and next year he will hire others to labour for him." If a man "continue through life in the condition of the hired labourer, it is not the fault of the system, but because of either a dependent nature which prefers it, or improvidence, folly, or singular misfortune." The "free labour system", concluded Lincoln, "opens the way for all- gives hope to all, and energy, and progress, and improvement of condition to all."

34

The face, though better preserved than most of the statue, has been battered by centuries of weathering and vandalism. In 1402, an Arab historian reported that a Sufi zealot had disfigured it “to remedy some religious errors.” Yet there are clues to what the face looked like in its prime. Archaeological excavations in the early 19th century found pieces of its carved stone beard and a royal cobra emblem from its headdress. Residues of red pigment are still visible on the face, leading researchers to conclude that at some point, the Sphinx’s entire visage was painted red. Traces of blue and yellow paint elsewhere suggest to Lehner that the Sphinx was once decked out in gaudy comic book colors.

For thousands of years, sand buried the colossus up to its shoulders, creating a vast disembodied head atop the eastern edge of the Sahara. Then, in 1817, a Genoese adventurer, Capt. Giovanni Battista Caviglia, led 160 men in the first modern attempt to dig out the Sphinx. They could not hold back the sand, which poured into their excavation pits nearly as fast as they could dig it out. The Egyptian archaeologist Selim Hassan finally freed the statue from the sand in the late 1930s. “The Sphinx has thus emerged into the landscape out of shadows of what seemed to be an impenetrable oblivion,” the New York Times declared.

35

Kids mimic what their parents do — and a new study on TV-viewing habits proves just that. Research published July 15 in *Paediatrics* shows that the amount of time parents watch TV is connected to how much TV their children watch, even more so than the location of the TV in the home or the family's rules for television watching. The American Academy of Paediatrics suggests that children and teens should only be allowed to use “high-quality” entertainment media for one to two hours per day. In addition, the house should have “screen-free” zones like the children's bedroom, where there are no TVs, computer games or video games. The TV should be turned off during dinner, the academy adds. Each hour of TV viewed by the parents was linked to an additional half hour of viewing time for children.

Children whose parents watched more than the average also watched more compared to kids whose parents stuck to the four hours daily. Parents' TV time had a stronger association to how much time children watched television compared to house rules on time limits, whether the children had a TV in the bedroom and whether the family was watching together. Parents who restricted television time only were able to cut down viewing times for children who were in the 6 to 11-year-old age group. Adolescents watched about one more hour of TV than their parents thought they did, the results also showed.

36

American English is, without doubt, the most influential and powerful variety of English in the world today. There are many reasons for this. First, the United States is, at present, the most powerful nation on earth and such power always brings with it influence. Indeed, the distinction between a dialect and a language has frequently been made by reference to power. As has been said, a language is a dialect with an army. Second, America's political influence is extended through American popular culture, in particular through the international reach of American films (movies, of course) and music. As Kahane has pointed out, the internationally dominant position of a culture results in a forceful expansion of its language.... the expansion of language contributes... to the prestige of the culture behind it. Third, the international prominence of American English is closely associated with the extraordinarily quick development of communications technology. Microsoft is owned by an American, Bill Gates.

This means a computer's default setting for language is American English, although of course this can be changed to suit one's own circumstances. In short, the increased influence of American English is caused by political power and the resultant diffusion of American culture and media, technological advance and the rapid development of communications technology.

37

Autism is a disorder characterized by impairments in communication, social interaction, and repetitive behaviors. Over the past 40 years, the measured prevalence of autism has multiplied roughly 10-fold. While progress has been made in understanding some of the factors associated with increased risk and rising prevalence, no one knows with certainty what causes autism or what caused autism prevalence to rise so precipitously. There is, however, a growing awareness among scholars that focusing solely on individual risk factors such as exposure to toxicants, prenatal complications, or parental education is insufficient to explain why autism prevalence rates have increased so stunningly.

Social and institutional processes likely play an important role. For example, changes in diagnostic criteria and an influx of resources dedicated to autism diagnosis may be critical to understanding why prevalence rates have risen. Increased awareness and social influence have been implicated in the rise of autism and a variety of comparable disorders, where social processes mimic the effects of contagion. Studies have examined the contribution of changes in diagnostic criteria and diagnostic substitution to rising autism prevalence rates, but the importance of institutional factors, resources for diagnosis, and greater awareness have not been systematically assessed. The sociological literature on health and inequality, however, provides substantial motivation for exploring how individual- and community-level effects operate to shape the likelihood of an autism diagnosis.

38

Nurse sharks are nocturnal animals, spending the day in large inactive groups of up to 40 individuals. Hidden under submerged ledges or in crevices within the reef, the Nurse sharks seem to prefer specific resting sites and will return to them each day after the nights hunting. By night, the sharks are largely solitary. Nurse sharks spend most of their time foraging through the bottom sediments in search of food. Their diet consists primarily of crustaceans, molluscs, tunicates and other fish such as spiny lobsters, crabs, shrimps, sea urchins, octopuses, squid, marine snails and bivalves and in particular, stingrays.

Nurse sharks are thought to take advantage of dormant fish which would otherwise be too fast for the sharks to catch, although their small mouths limit the size of prey items, the sharks have large throat cavities which are used as a sort of bellows valve. In this way, Nurse Sharks are able to suck in their prey. Nurse sharks are also known to graze algae and coral.

Generally slow and sluggish, Nurse sharks spend much of their time resting on the bottom of the ocean. Nurse sharks have been observed resting on the bottom with their bodies supported on their fins, possibly providing a false shelter for crustaceans which they then ambush and eat. If it must move, the Nurse shark may even use its large front (or pectoral) fins to 'walk' along the ocean floor.

39

When the Rosetta stone was discovered in 1799, the carved characters that covered its surface were quickly copied. Printer's ink was applied to the Stone and white paper laid over it. When the paper was removed, it revealed an exact copy of the text—but in reverse. Since then, many copies or "facsimiles" have been made using a variety of materials. Inevitably, the surface of the Stone accumulated many layers of material left over from these activities, despite attempts to remove any residue. Once on display, the grease from many thousands of human hands eager to touch the Stone added to the problem. An opportunity for investigation and cleaning the Rosetta Stone arose when this famous object was made the centerpiece of the Cracking Codes exhibition at The British Museum in 1999.

When work commenced to remove all but the original, ancient material the stone was black with white lettering. As treatment progressed, the different substances uncovered were analyzed. Grease from human handling, a coating of carnauba wax from the early 1800s and printer's ink from 1799 were cleaned away using cotton wool swabs and liniment of soap, white spirit, and acetone and purified water. Finally, white paint in the text, applied in 1981, which had been left in place until now as a protective coating, was removed with cotton swabs and purified water. A small square at the bottom left corner of the face of the Stone was left untouched to show the darkened wax and the white infill.

40

The booksellers of Hookham and Carpenter (hereafter referred to only as ‘Hookham’) were located on New Bond Street in London, and their records span the most politically turbulent decade of the eighteenth-century—the 1790s. Clients who frequented Hookham were primarily from the aristocratic or gentry classes. In fact, of Hookham’s total buyers, 22% were aristocracy and 35% of the aristocracy purchased novels. We can also confidently assume that untitled female customers were of gentry income, because their addresses were primarily in London’s fashionable ‘West End’. Hookham’s ledgers not only reveal a dramatic increase in the proportion of female purchasers of novels by comparison to earlier studies of provincial women, but they also reveal a remarkable increase in the proportion of female purchases of novels authored by females. Such a marked increase illustrates that Hookham’s leisured female customers were able to buy more novels. Furthermore, the fact that these female aristocrats and gentry have accounts under their own name, not their husbands’, demonstrates the greater degree of agency and independence that these urban, moneyed women had relative to provincial women.

However, because our study does not include an examination of male customers, we are very limited in what claims we can make about whether or not these women behaved according to the cliché that women were the predominant consumers of novels in the eighteenth-century. Moreover, while more disposable income and leisure time certainly accounts for the significant increase in female purchases of novels authored by women in the 1790s, this increase also strongly suggests a desire on the part of women readers to engage in this politically charged decade. Thus, novel-reading provided women readers with the means through which they were able to participate in the male-dominated world of politics. The latter part of our paper will more fully explore this hypothesis in the context of certain recent literary scholars’ claims that both Gothic and sentimental novels are actively engaged in political debate and discussion.

41

After the 1950 flying season, the Wrights contacted the United States War Department, as well as governments and individuals in England, Germany and Russia, offering to sell a flying machine. They were turned down time and time again-government bureaucrats thought they were crackpots; other thought that is two bicycle machines could build a successful airplane, they could do it themselves. But the Wright persisted, and in 1907, the US Army Signal Corps asked for an aircraft. Just a few months later, in early 1908, a French syndicate of businessmen agreed to purchase another. Both the US Army and the French asked for an airplane capable of carrying a passenger. The Wright brothers hastily adapted their 1905 Flyer with two seats and a more powerful engine.

They tested these modifications in secret, back Kitty Hawk, North Carolina for the first time in several years. Then the brothers parted temporarily – Wilbur to France and Orville to Virginia. In 1908 and 1909, Wilbur demonstrated Wright aircraft in Europe, and Orville flew in Fort Meyer, Virginia. The flights went well until Orville lost a propeller and crashed, breaking his leg and killing his passenger Lt. Thomas Selfridge. While Orville recuperated, Wilbur kept flying in France, breaking record after record. Orville and his sister Kate eventually joined Wilbur in France, and the three returned to Fort Meyer with a new Military Flyer and completed the US Army trials. A few months later, Wilbur flew before over a million spectators in New York Harbor-his first public flight in his native land. All of these flights stunned and captivated the world. The Wright Brothers became the first great celebrities of the twentieth century.

42

Scientists often think that invasive plants succeed in a habitat because they happened to have already evolved favorable traits—a taste for the local soil, for example, or resistance to local pests. This research shows something different. It found that once relocated, a plant is able to continue to evolve rapidly to conquer its new habitat. Two biologists from the University of Toronto and the University of British Columbia did an experiment to demonstrate that purple loosestrife living in different parts of the continent is adapted to its environment. They gathered purple loosestrife from the northern and southern regions of its range, then transplanted the northerners south, and the southerners north.

The researchers, Robert Colautti and Spencer Barrett, found purple loosestrife produced fewer fruits the farther away it was from its original habitat. That indicated that the plants' differences were adapted to their environments. Northern purple loosestrife has to deal with a shorter growing season, so it blooms early in the spring to take advantage of as much time as possible. Compared to southern loosestrife grown in the north, it can produce up to 37 times as many fruits. But because it blooms later, southern loosestrife can grow bigger. In the southern U.S., where the growing season is long, southern-adapted loosestrife makes nine times as many fruits as northern-adapted loosestrife. By looking at other studies of the plant, Colautti and Barrett also found that purple loosestrife's blooming time and size adaptations were at least as important to its survival as the lack of natural predators in its new environment. This may also apply to Australia's weeds like thistle, lantana, Paterson's Curse and more.

43

What is museology? A simple definition might be that it is the study of museums, their history and underlying philosophy, the various ways in which they have, in the course of time, been established and developed, their avowed or unspoken aims and policies, their educative or political or social role. More broadly conceived, such a study might also embrace the bewildering variety of audiences – visitors, scholars, art lovers, children- at whom the efforts of museum staff are supposedly directed, as well as related topics such as the legal duties and responsibilities place upon (or incurred by) museums, perhaps even some thought as to their future.

Seen in this light, museology might appear at first sight a subject so specialized as to concern only museum professionals, who by virtue of their occupation are more or less obliged to take an interest in it. In reality, since museums are almost, if not quite as old as civilization itself, and since the plethora of present-day museums embraces virtually every field of human endeavour- not just art, or craft, or science, but entertainment, agriculture, rural life, childhood, fisheries, antiquities, automobiles: the list is endless – it is a field of enquiry so broad as to be a matter of concern to almost everybody.

44

In its periodic quest for culinary identity, Australia automatically looks to its indigenous ingredients, the foods that are native to this country. 'There can be little doubt that using an indigenous product must qualify a dish as Australian notes Stephanie Alexander. Similarly, and without qualification, Cherkoff state that 'A uniquely Australian food culture can only be based upon foods indigenous to this country, although, as Craw remarks, proposing Australian native foods as national symbols relies more upon their association with 'nature' and geographic origin than on common usage. Notwithstanding the lack of justification for the premise that national dishes are, of necessity, founded on ingredients native to the country – after all, Italy's gastronomic identity is tied to the non-indigenous tomato, Thailand's to the non-indigenous chili—the reality is that Australians do not eat indigenous foods in significant quantities.

The exceptions are fish, crustaceans and shellfish from oceans, rivers and lakes, most of which are unarguably unique to this country. Despite valiant and well-intentioned efforts today at promoting and encouraging the consumption of native resources, bush foods are not harvested or produced in sufficient quantities for them to be a standard component of Australian diets, nor are they generally accessible. Indigenous foods are less relevant to Australian identity today than lamb and passionfruit, both initially imported and now naturalised.

45

The notion that office space has a role in promoting or inhibiting performance is backed up by solid research. A recent study conducted by Harvard University and Massachusetts General Hospital showed that improvements to the physical surroundings of workers impacted on productivity not just because the working environment was more attractive, but because the changes made employees feel cared for. A Swedish research paper revealed a strong link between the type of office an employee worked in and their overall job satisfaction and health. Various findings have emerged as a result of studies such as this. Pot plants and greenery can apparently have a real impact on psychological well-being. Those who work in a private room tend to be in better health than workers based in open-plan offices. Sufficient light can reduce sickness among workers and increase productivity and an attractive office can make workers feel more cared for and therefore more loyal to their company. Most of these points make good rational sense. But some companies aren't content simply to increase the health, productivity and contentment of their employees.

Pioneers such as Google, Walt Disney and Dyson have tried to create offices that will do everything from promoting collaboration between workers to stimulating their creative juices. "Environment, both physical and cultural, can make or break creativity," says Kursty Groves, author of *I Wish I Worked There! A Look inside the Most Creative Spaces in Business*. "Stimulating spaces expose the mind to a variety of stimuli-planned or random-in order to encourage people to think differently. Reflective spaces promote the filtering of information into the brain, slowing it to make connections. An environment which encourages a team to build trust and to play freely is an essential ingredient for innovation." In my view, this is a positive step forward in the evolution of human technology, and it carries great potential for a total positive redesign of education.

46

When an individual drives a car, heats a house, or uses an aerosol hair spray, greenhouse gases are produced. In economic terms, this creates a classic negative externality. Most of the cost (in this case, those arising from global warming) are borne by individuals other than the one making the decision about how many miles to drive or how much hair spray to use. Because the driver (or sprayer) enjoys all the benefits of the activities but suffers only part of the cost, that individual engages in more than the economically efficient amount of the activity. In this sense, the problem of greenhouse gases parallels the problem that occurs when someone smokes a cigarette in an enclosed space or litters the countryside with fast-food wrappers. If we are to get individuals to reduce production of greenhouse gases to the efficient rate, we must somehow induce them to act as though they bear all the costs of their actions. The two most widely accepted means of doing this are government regulation and taxation, both of which have been proposed to deal with greenhouse gases.

Many human activities are responsible for the production of greenhouse gases. Generating electricity is the single largest source of CO₂ emissions in the United States, followed by transportation. Negative externalities are created by individuals that engage in more than the economically efficient amount of an activity, such as driving. Because the driver enjoys all of the benefits that come along with driving and only suffer part of the cost, they do not put a limit on how far or how often they should drive. The only way to get individuals to participate in reducing greenhouse gases is by having them bear all the costs of their actions. This is difficult because the costs are so little compared to the benefit, so why give up something that benefits more than sets you back. Two different methods are being proposed in order to help humans take into consideration the costs of their actions in order to reduce production of greenhouse gases. The methods proposed are government regulation and taxation.

47

The co-evolutionary relationship between cows and grass is one of nature's underappreciated wonders; it also happens to be the key to understanding just about everything about modern meat. For the grasses, which have evolved to withstand the grazing of ruminants, the cow maintains and expands their habitat by preventing trees and shrubs from gaining a foothold and hogging the sunlight; the animal also spreads grass seed, plants it with his hooves, and then fertilizes it with his manure. In exchange for these services the grasses offer ruminants a plentiful and exclusive supply of lunch.

For cows (like sheep, bison, and other ruminants) have evolved the special ability to convert grass which single stomached creatures (like us can't digest into high quality protein). They can do this because they possess what is surely the most highly evolved digestive organ in nature: the rumen. About the size of a medicine ball, the organ is essentially a forty five gallon fermentation tank in which a resident population of bacteria dines on grass.



48

Armed police have been brought into NSW schools to reduce crime rates and educate students. The 40 School Liaison Police (SLP) officers have been allocated to public and private high schools across the state. Organisers say the officers, who began work last week, will build positive relationships between police and students. But parent groups warned of potential dangers of armed police working at schools in communities where police relations were already under strain.

Among their duties, the SLPs will conduct crime prevention workshops, talking to students about issues including shoplifting, offensive behaviour, graffiti and drugs and alcohol. They can also advise school principals. One SLP, Constable Ben Purvis, began work in the inner Sydney region last week, including at Alexandria Park Community School's senior campus. Previously stationed as a crime prevention officer at The Rocks, he now has 27 schools under his jurisdiction in areas including The Rocks, Redfern and Kings Cross. Constable Purvis said the full time position would see him working on the broader issues of crime prevention. "I am not a security guard," he said. "I am not there to patrol the school."

We want to improve relationships between police and schoolchildren, to have positive interaction. We are coming to the school and giving them knowledge to improve their own safety."

Parents' groups responded to the program positively, but said it may spark a range of community reactions." It is a good thing and an innovative idea and there could be some positive benefits," Council of Catholic School Parents executive officer Danielle Cronin said. "Different communities will respond to this kind of presence in different ways.

49

When Namibia gained independence in 1990, teenager Pascolena Florry was herding goats in the country's dry, desolate northern savannah. Her job, unpaid and dangerous, was to protect her parents' livestock from preying jackals and leopards. She saw wildlife as the enemy, and many of the other indigenous inhabitants of Namibia's rural communal lands shared her view. Wildlife poaching was commonplace. Fifteen years later, 31 year old Pascolena's life and outlook are very different.

She has built a previously undreamed of career in tourism and is the first black Namibian to be appointed manager of a guest lodge. Her village, and hundreds of others, have directly benefited from government efforts to devolve management and tourism development on communal lands to conservancies run by indigenous peoples. "Now we see the wildlife as our way of creating jobs and opportunities as the tourism industry grows," she says. "The future is better with wildlife around, not only for jobs, but also for the environment".



50

As far as prediction is concerned, remember that the chairman of IBM predicted in the fifties that the world would need a maximum of around half a dozen computers, that the British Department for Education seemed to think in the eighties that we would all need to be able to code in BASIC and that in the nineties Microsoft failed to foresee the rapid growth of the Internet. Who could have predicted that one major effect of the automobile would be to bankrupt small shops across the nation? Could the early developers of the telephone have foreseen its development as a medium for person to person communication, rather than as a form of broadcasting medium? We all, including the 'experts', seem to be peculiarly inept at predicting the likely development of our technologies, even as far as the next year. We can, of course, try to extrapolate from experience of previous technologies, as I do below by comparing the technology of the Internet with the development of other information and communication technologies and by examining the earlier development of radio and print.

But how justified I might be in doing so remains an open question. You might conceivably find the history of the British and French videotex systems, Prestel and Minitel, instructive. However, I am not entirely convinced that they are very relevant, nor do I know where you can find information about them on line, so, rather than take up space here, I've briefly described them in a separate article.

51

In order to have a competitive edge, athletes often use drugs with high athletic performance. Honey's impact on athletes has always been neglected, but there has been more and more researches on diet to help athletes recovery, especially honey.

The National Honey Board recently found that honey has the same functions but less negative impact. This clinical trial is the third in a series of studies focusing on the use of honey by athletes. The first study (involving 71 subjects) determined that honey has a milder effect on blood sugar than other popular forms of carbohydrate gel.

The second study in the series (with 39 weight trained subjects) investigated the combination of honey with a protein supplement and suggested that honey speeds muscle recovery after a workout.



52

By 1984, the Internet had grown to include 1,000 host computers. The National Science Foundation was one of the first outside institutions hoping to connect to this body of information. Other government, non-profit, and educational institutions followed. Initial attempts to catalogue this rapidly expanding system of networks were simple. Among the first was Archie, a list of FTP information created by Peter Deutsch at McGill University in Montreal. However, the greatest innovation in the Internet was still to come, brewing in an MIT laboratory in Cambridge, Mass.

The World Wide Web, or the Web, is often confused with the Internet. In fact, it is just one part of the Internet. In fact, it is just one part of the Internet, along with email, video conferencing, and streaming audio channels. In 1989, Tim Berners-Lee, now a scientist at the Massachusetts Institute of Technology, introduced a new system of communication on the Internet which used hyperlinks and a user-friendly graphical interface, his slice of the Internet pie came to be known as the World Wide Web.

Berners-Lee says, "The Web is an abstract (imaginary) space of information. On the Net, you find computers; on the Web, you find documents, sounds, videos, information. On the Net, the connections are cables between computers; on the web, connections are hypertext links. The Web exists because of programs which communicate between computers on the Net. The Web could not be without the Net. The Web made the Net useful because people are really interested in information (not to mention knowledge and wisdom!) and don't really want to know about computers and cables."

53

Malaysia is one of the most pleasant, hassle-free countries to visit in Southeast Asia. Aside from its gleaming 21st century glass towers, it boasts some of the most superb beaches, mountains and national parks in the region.

Malaysia is also launching its biggest-ever tourism campaign in effort to lure 20 million visitors here this year. More than 16 million tourists visited in 2005, the last year for which complete statistics were available. While the majority of them were from Asia, mostly neighboring Singapore, Thailand, Indonesia, Brunei, China, Japan and India, a growing number of Western travelers are also making their way to this Southeast Asian tropical paradise. Of the 885,000 travelers from the West, 240,000 were from the United Kingdom, 265,000 from Australia and 150,000 from the U.S.

Any tourist itinerary would have to begin in the capital, Kuala Lumpur, where you will find the Petronas Twin Towers, which once comprised the world's tallest buildings and now hold the title of second-tallest. Both the 88-story towers soar 1,480 feet high and are connected by a sky-bridge on the 41st floor.

Also worth visiting is the Central Market, a pre-war building that was the main wet market for the city, and has now been transformed into an arts and cultural center.

The limestone temple Batu Caves, located 9 miles north of the city, have a 328-foot-high ceiling and feature ornate Hindu shrines, including a 141-foot-tall gold-painted statue of a Hindu deity. To reach the caves, visitors have to climb a steep flight of 272 steps.

In Sabah state on Borneo Island – not to be confused with Indonesia's Borneo – you'll find the small mushroom-shaped Sipadan island, off the coast of Sabah, rated as one of the top five diving sites in the world. Sipadan is the only oceanic island in Malaysia, rising from a 2,300-foot abyss in the Celebes Sea.

You can also climb Mount Kinabalu, the tallest peak in Southeast Asia, visit the Sepilok Orang Utan Sanctuary, go white-water rafting and catch a glimpse of the bizarre Proboscis monk.

54

Architecture, the art of building in which human requirements and construction materials are related so as to furnish practical use as well as an aesthetic solution, thus differing from the pure utility of engineering construction. As an art, architecture is essentially abstract and nonrepresentational and involved the manipulation of the relationships of spaces, volumes, planes, masses, and voids. Time is also an important factor in architecture, since a building is usually comprehended in a succession of experiences rather than all at once. In most architecture there is on one vantage point from which the whole structure can be understood. The use of light and shadow, as well as surface decoration, can greatly enhance a structure.

The analysis of building types provides and insight into past cultures and eras. Behind each of the greater styles lies not a casual trend nor a vogue, but a period of serious and urgent experimentation directed toward answering the needs of a specific way of life. Climate, methods of labor, available materials, and economy of means all impose their dictates. Each of the greater styles has been aided by the discovery of new construction methods. Once developed, a method survives tenaciously, giving way only when social changes or new building techniques have reduced it. That evolutionary process is ex-amplified by the history of modern architecture, which developed from the first uses of structure iron and steel in the mid-19th century.

55

Coffee is enjoyed by millions of people every day and the “coffee experience” has become a staple of our modern life and culture. This is according to the Institute of Food Technologists (IFT), an international non-profit scientific society of professionals engaged in food science, food technology, and related areas in academia, government and industry that is based in the US.

While the current body of research related to the effects of coffee consumption on human health has been contradictory, a study in the in the June issue of the journal *Comprehensive Reviews in Food Science and Food Safety*, which is published by IFT, found that the potential benefits of moderate coffee drinking outweigh the risks in adult consumers for the majority of major health outcomes considered.

Researchers at Ulster University in the UK systematically reviewed 1,277 studies from 1970 to date on coffee’s effect on human health and found the general scientific consensus is that regular, moderate coffee drinking (defined as three to four cups per day) essentially has a neutral effect on health, or can be mildly beneficial. The authors noted causality of risks and benefits cannot be established for either with the research currently available as they are largely based on observational data. Further research is needed to quantify the risk-benefit balance for coffee consumption, as well as identify which of coffee’s many active ingredients, or indeed the combination of such, that could be inducing these health benefits.

56

In 1920, the eighteenth Amendment to the United States Constitution created yet another setback for the American wine industry. The National prohibition Act, also known as the Volstead Act, prohibited the manufacture, sale, transportation, importation, delivery, or possession of intoxicating liquors for beverage purposes. Prohibition, which continued for thirteen years, nearly destroyed what had become a thriving and national industry.

One of the loopholes in the Volstead Act allowed for the manufacture and sale of sacramental wine, medicinal wines for sale by pharmacists with a doctor's prescription, and medicinal wine tonics (fortified wines) sold without prescription. Perhaps more important, prohibition allowed anyone to produce up to two hundred gallons yearly of fruit juice or cider. The fruit juice, which was sometimes made into concentrate, was ideal for making wine. People would buy grape concentrate from California and have it shipped to the East Coast. The top of the container was stamped in big bold letters: caution: do not add sugar or yeast or else fermentation will take place! Some of this yield found its way to bootleggers throughout America who did just that. But not for long, because the government stepped in and banned the sale of grape juice, preventing illegal wine production. Vineyards stopped being planted, and the American wine industry came to a halt.

57

Parents' own birth order can become an issue when dynamics in the family they are raising replicate the family in which they were raised. Agati notes common examples, such as a firstborn parent getting into "raging battles" with a firstborn child. "Both are used to getting the last word. Each has to be right. But the parent has to be the grown up and step out of that battle," he advises. When youngest children become parents, Agati cautions that because they "may not have had high expectations placed on them, they in turn may not see their kids for their abilities." But he also notes that since youngest children tend to be more social, "youngest parents can be helpful to their firstborn, who may have a harder time with social situations. These parents can help their eldest kids loosen up and not be so hard on themselves. Mom Susan Ritz says her own birth order didn't seem to affect her parenting until the youngest of her three children, Julie, was born. Julie was nine years younger than Ritz's oldest, Joshua, mirroring the age difference between Susan and her own older brother. "I would see Joshua do to Julie what my brother did to me," she says of the taunting and teasing by a much older sibling.

"I had to try not to always take Julie's side." Biases can surface no matter what your own birth position was, as Lori Silverstone points out. "As a middle myself, I can be harder on my older daughter. I recall my older sister hitting me," she says of her reactions to her daughters' tussles.

"My husband is a firstborn. He's always sticking up for the oldest. He feels bad for her that the others came so fast. He helps me to see what that feels like, to have that attention and then lose it." Silverstone sees birth order triggers as "an opportunity to heal parts of ourselves. I've learned to teach my middle daughter to stand up for herself. My mother didn't teach me that. I'm conscious of giving my middle daughter tools so she has a nice way to protect herself."

Whether or not you subscribe to theories that birth order can affect your child's personality, ultimately, "we all have free will," Agati notes. It's important for both parents and kids to realize that, despite the characteristics often associated with birth order, "you're not locked into any role."

58

Slightly less than one in five carers (19%) were primary carers (475,000 people). That is, they were the main carer of a person who was limited in carrying out the core everyday activities of mobility, communication or self-care. Both primary carers and the larger group of other carers (close to 2 million) contribute to the wellbeing of older people and people with disabilities. However, because they care for people who otherwise would have difficulty carrying out basic everyday activities, there is particular interest in primary carers: in the contribution they make, their wellbeing, labor force experiences, motivations and the support they receive in caring.

Primary carers were more likely than other carers to be assisting someone who lived in the same household (81% compared with 76%). As with caring as a whole, the likelihood of being primary care increased with age to peak at age 55-64 years, where one in twenty people were primary carers. However, rather than then declining, the likelihood of being a primary carer remained at around this level among the older age groups. Consequently, primary carers had a somewhat older age profile than other carers. The median age of primary carers was 52 years, compared with 47 years for other carers.

Primary carers were more likely than other carers to be female (71% compared with 50%) and less likely to be in the labor force (39% compared with 60%). Women not in the labor force were by far the largest single group among primary carers (44%). In contrast, men employed full-time were the largest single group among other carers (25%). Consistent with their lower labor force participation, primary carers had lower personal incomes than other carers (a median gross income of \$237 per week compared with \$327 per week) and were more likely to have a government pension or allowance as their main source of income (55% compared with 35%).

59

Some of this panic is overdone—and linked to the business cycle: there was much ado about “a war for talent” in America in the 1990s, until the dotcom bubble burst. People often talk about shortages when they should really be discussing price. Eventually, supply will rise to meet demand and the market will adjust. But, while you wait, your firm might go bust. For the evidence is that the talent shortage is likely to get worse.

Nobody really disputes the idea that the demand for talent-intensive skills is rising. The value of “intangible” assets—everything from skilled workers to patents to know-how—has ballooned from 20% of the value of companies in the S&P 500 to 70% today. The proportion of American workers doing jobs that call for complex skills has grown three times as fast as employment in general. As other economies move in the same direction, the global demand is rising quickly.

As for supply, the picture in much of the developed world is haunted by demography. By 2025 the number of people aged 15-64 is projected to fall by 7% in Germany, 9% in Italy and 14% in Japan. Even in still growing America, the imminent retirement of the baby-boomers means that companies will lose large numbers of experienced workers in a short space of time (by one count half the top people at America's 500 leading companies will go in the next five years). Meanwhile, two things are making it much harder for companies to adjust.

The first is the collapse of loyalty. Companies happily chopped out layers of managers during the 1990s; now people are likely to repay them by moving to the highest bidder. The second is the mismatch between what schools are producing and what companies need. In most Western countries schools are churning out too few scientists and engineers—and far too many people who lack the skills to work in a modern economy (that's why there are talent shortages at the top alongside structural unemployment for the low-skilled).

60

When Australians engage in debate about educational quality or equity, they often seem to accept that a country cannot achieve both at the same time.

Curriculum reforms intended to improve equity often fail to do so because they increase breadth or differentiation in offerings in a way that increases differences in quality. Further, these differences in quality often reflect differences in students' social backgrounds because the 'new' offerings are typically taken up by relatively disadvantaged students who are not served well them. Evidence from New South Wales will be used to illustrate this point.

The need to improve the quality of education is well accepted across OECD and other countries as they seek to strengthen their human capital to underpin their modern, knowledge economies. Improved equity is also important for this purpose, since the demand for high-level skills is widespread and the opportunities for the low skilled are diminishing.

Improved equity in education is also important for social cohesion. There are countries in which the education system seems primarily to reproduce existing social arrangements, conferring privilege where it already exists and denying it where it does not. Even in countries where the diagnosis might be less extreme, the capacity of schooling to build social cohesion is often diminished by the way in which schools separate individuals and groups.

61

Consider the current situation: like their counterparts in the United States, engineers and technicians in India have the capacity to provide both computer programming and innovative new technologies. Indian programmers and high-tech engineers earn one-quarter of what their counterparts earn in the United States; Consequently, India is able to do both jobs at a lower dollar cost than the United States: India has absolute advantage in both. In other words, it can produce a unit of programming for fewer dollars than the United States, and it can also produce a unit of technology innovation for fewer dollars. Does that mean that the United States will lose not only programming jobs but innovative technology jobs, too? Does that mean that our standard of living will fall if the United States and India engage in the international trade?

David Ricardo would have answered no to both questions-- as we do today. While India may have an absolute advantage in both activities, that fact is irrelevant in determining what India or the United States will produce. India has a comparative advantage in doing programming in part because such activity requires little physical capital. The flip side is that the United States has a comparative advantage in technology innovation partly because it is relatively easy to obtain capital in this country to undertake such long--run projects. The result is that Indian programmers will do more and more of what U.S. programmers have been doing in the past. In contrast, American firms will shift to more and more innovation.

62

In around 2300 BP (Before Present), hunter-gatherers called the San acquired domestic stock in what is now modern-day Botswana. Their population grew, and spread throughout the Western half of South Africa, they were the first pastoralists in southern Africa, and called themselves Khoikhoi (or Khoe), which means 'men of men' or 'the real people'. This name was chosen to show pride in their past and culture. The Khoikhoi brought a new way of life to South Africa and to the San, who were hunter-gatherers as opposed to herders. This led to misunderstandings and subsequent conflict between the two groups.

The Khoikhoi were the first native people to come into contact with the Dutch settlers in the mid-17th century. As the Dutch took over land for farms, the Khoikhoi were dispossessed, exterminated, or enslaved and therefore their numbers dwindled. The Khoikhoi used a word while dancing that sounded like 'Hottentots' and therefore settlers referred to the Khoikhoi by this name-however today this term is considered derogatory. The settlers used the term 'Bushmen' for the San, a term also considered derogatory today. Many of those whom the colonists called 'Bushmen' were in fact Khoikhoi or former Khoikhoi. For this reason, scholars sometimes find it convenient to refer to hunters and herders together as 'Khoisan'.

When European settlement began, Khoikhoi groups called the Namaqua were settled in modern day Namibia and the north-eastern Cape; others, including the Koran, along the Orange River; and the Gonaqua, interspersed among the Xhosa in the Eastern Cape. But the largest concentration of Khoikhoi, numbering in the tens of thousands inhabited the well-watered pasture lands of the south-western Cape. These 'Cape' Khoikhoi would be the first African population to bear the brunt of White settlement. The Khoikhoi kept herds of animals such as goat, cattle and sheep and had to move around to find enough grazing land for their animals. They moved according to the seasons and only stayed in one place for a few weeks. This meant that they had to be able to carry all their belongings themselves, or load them onto the backs of their animals. Houses had to be very light and easy to erect and take apart. For this reason they were made of thin poles covered with reed mats. Even pots and buckets were made of wood with small handles to make them easier to tie to animals' backs. They also wore clothes made of leather, like the San.

63

According to new research, house mice (*Mus musculus*) are ideal biomarkers of human settlement, as they tend to stow away in crates or on ships that end up going where people go. Using mice as a proxy for human movement can add to what is already known through archaeological data and answer important questions in areas where there is a lack of artifacts, Searle said.

Where people go, so do mice, often stowing away in carts of hay or on ships. Despite a natural range of just 100 meters (109 yards) and an evolutionary base near Pakistan, the house mouse has managed to colonize every continent, which makes it a useful tool for researchers like Searle.

Previous research conducted by Searle at the University of York supported the theory that Australian mice originated in the British Isles and probably came over with convicts shipped there to colonize the continent in the late 18th and 19th centuries.

In the Viking study, he and his fellow researchers in Iceland, Denmark and Sweden took it a step further, using ancient mouse DNA collected from archaeological sites dating from the 10th to 12th centuries, as well as modern mice.

He is hoping to do just that in his next project, which involves tracking the migration of mice and other species, including plants, across the Indian Ocean, from South Asia to East Africa.

64

Naps aren't generally included in the litany of good-for-your-heart lifestyle choices recommended for lowering cardiovascular risk, but they may soon be. New research suggests a midday siesta may reduce a person's risk of death from heart disease, possibly by lowering stress levels. The findings must be confirmed, but Dimitrios Trichopoulos, MD, a study author, tells us that there is little downside to taking naps — and there could be big health benefits. "The siesta is a victim of progress. Most of us aren't in the position to take a daily nap," he says. "But our research suggests that the practice could help protect the heart, and we need further studies to find out if this really is the case."

Trichopoulos says the research stemmed from the observation that heart disease death rates are lower in Mediterranean and Latin American countries where midday siestas are part of the culture. His own earlier research in a Greek population provided weak evidence in favour of the nap hypothesis, but another, larger study, conducted in Costa Rica failed to show an association.

The newly published Greek study by Trichopoulos and colleagues from the Harvard School of Public Health in Boston, and Greece's University of Athens Medical School is the largest ever to examine the issue in a previously healthy population. A total of 23,681 residents of Greece with no history of heart disease, stroke, or cancer at enrollment were followed an average of 6.3 years. And the study revealed that people who took naps at least three times a week for average of at least 30 minutes were 37% less likely to die of heart disease than people who did not take regular naps.

65

All non-human animals are constrained by the tools that nature has bequeathed them through natural selection. They are not capable of striving towards truth; they simply absorb information, and behave in ways useful for their survival. The kinds of knowledge they require of the world have been largely pre-selected by evolution. No animal is capable of asking questions or generating problems that are irrelevant to its immediate circumstances or its evolutionarily designed needs. When a beaver builds a dam, it doesn't ask itself why it does so, or whether there is a better way of doing it. When a swallow flies south, it doesn't wonder why it is hotter in Africa or what would happen if it flew still further south.

Humans do ask themselves these and many other kinds of questions, questions that have no relevance, indeed make little sense, in the context of evolved needs and goals. What marks out humans is our capacity to go beyond our naturally defined goals such as the need to find food, shelter or a mate and to establish human created goals.

Some contemporary thinkers believe that there are indeed certain questions that humans are incapable of answering because of our evolved nature. Steven Pinker, for instance, argues that "Our minds evolved by natural selection to solve problems that were life and death matters to our ancestors, not to commune with correctness or to answer any question we are capable of asking. We cannot hold ten thousand words in our short-term memory. We cannot see ultra violet light. We cannot mentally rotate an object in the fourth dimension. And perhaps we cannot solve conundrums like free will and sentience."

66

Males do the singing and females do the listening. This has been the established, even cherished view of courtship in birds, but now some ornithologists are changing tune. László Garamszegi of the University of Antwerp, Belgium, and colleagues studied the literature on 233 European songbird species. Of the 109 for which information on females was available, they found evidence for singing in 101 species. In only eight species could the team conclude that females did not sing?

Females that sing have been overlooked, the team say, because their songs are quiet, they are mistaken for males from their similar plumage or they live in less well studied areas such as the tropics. Garamszegi blames Charles Darwin for the oversight. “He emphasised the importance of male sexual display, and this is what everyone has been looking at.”

The findings go beyond modern species. After carefully tracing back an evolutionary family tree for their songbirds, Garamszegi’s team discovered that, in at least two bird families, singing evolved in females first. They suggest these ancient females may have been using their songs to deter other females from their territories, to coordinate breeding activities with males, or possibly to attract mates. “It leaves us with a perplexing question,” says Garamszegi. “What evolutionary forces drove some females to give up singing?”

67

The world engages in improving literacy of reading and writing, but it is not that important now. What is text/written language anyway? It's an ancient IT for storing and retrieving information. We store information by writing it, and we retrieve it by reading it. Six thousand to 10,000 years ago, many of our ancestors' hunter--gatherer societies settled on the land and began what's known as the agricultural revolution. That new land settlement led to private property and increased production and trade of goods, generating a huge new influx of information. Unable to keep all this information in their memories, our ancestors created systems of written records that evolved over millennia into today's written language.

But this ancient IT is already becoming obsolete. Text has run its historic course and is now rapidly getting replaced in every area of our lives by the ever--increasing array of emerging ITs driven by voice, video, and body movement rather than the written word.

In my view, this is a positive step forward in the evolution of human technology, and it carries great potential for a total positive redesign of education.

68

What is the solution for nations with increasing energy demands, hindered by frequent power cuts and an inability to compete in the international oil market? For East Africa at least, experts think geothermal energy is the answer. More promising still, the Kenyan government and international investors seem to be listening. This is just in time according to many, as claims of an acute energy crisis are afoot due to high oil prices, population spikes and droughts. Geothermal energy works by pumping water into bedrock, where it is heated and returns to the surface as steam which is used directly as a heat source or to drive electricity production. Source: Energy Information Administration, Geothermal Energy in the Western United States and Hawaii.

Currently over 60% of Kenya's power comes from hydroelectric sources but these are proving increasingly unreliable as the issue of seasonal variation is intensified by erratic rain patterns. Alternative energy sources are needed and the leading energy supplier in Kenya, Kenya Electricity Generating Company (KenGen), hopes to expand its geothermal energy supply from 13% to 25 % of its total usage by 2020. The potential of geothermal energy in the region was first realised internationally by the United Nations Development Program, when geologists observed thermal anomalies below the East African Rift system. Locals have been utilizing this resource for centuries using steam vents to create the perfect humidity for greenhouses, or simply to enjoy a swim in the many natural hot lakes.

Along the 6000 km of the rift from the Red Sea to Mozambique, geochemical, geophysical and heat flow measurements were made to identify areas suitable for geothermal wells.

One area lies next to the extinct Olkaria volcano, within the Hell's Gate National Park, and sits over some of the thinnest continental crust on Earth. This is a result of the thinning of the crust by tectonic stretching, causing hotter material below the Earth's surface to rise, resulting in higher temperatures. This thin crust was ideal for the drilling of geothermal wells, reaching depths of around 3000 m, where temperatures get up to 342°C, far higher than the usual temperature of 90°C at this depth. Water in the surrounding rocks is converted to steam by the heat. The steam can be used to drive turbines and produce electricity.

69

Who would have thought back in 1698, as they downed their espressos, that the little band of stockbrokers from Jonathan's Coffee House in Change Alley EC3 would be the founder members of what would become the world's mighty money capital?

Progress was not entirely smooth. The South Sea Bubble burst in 1720 and the coffee house exchanges burned down in 1748. As late as Big Bang in 1986, when bowler hats were finally hung up, you wouldn't have bet the farm on London surpassing New York, Frankfurt and Tokyo as Mammon's international nexus. Yet the 325,000 souls who operate in the UK capital's financial hub have now overtaken their New York rivals in size of the funds managed (including offshore business); they hold 70% of the global secondary bond market and the City dominates foreign exchange trading. And its institutions paid out £9 billion in bonuses in December. The Square Mile has now spread both eastwards from EC3 to Canary Wharf and westwards into Mayfair, where many of the private equity 'locusts' and their hedge fund pals now hang out.

For foreigners in finance, London is the place to be. It has no Sarbanes Oxley and no euro to hold it back, yet the fact that it still flies so high is against the odds. London is one of the most expensive cities in the world to live in, transport systems groan and there's an ever present threat of terrorist attack. But, for the time being, the deals just keep on getting bigger.

70

This year's Nobel Peace Prize justly rewards the thousands of scientists of the United Nations Climate Change Panel (the IPCC). These scientists are engaged in excellent, painstaking work that establishes exactly what the world should expect from climate change.

The other award winner, former US Vice President Al Gore, has spent much more time telling us what to fear. While the IPCC's estimates and conclusions are grounded in careful study, Gore doesn't seem to be similarly restrained.

Gore told the world in his Academy Award winning movie (recently labeled "one sided" and containing "scientific errors" by a British judge) to expect 20 foot sea level rises over this century. He ignores the findings of his Nobel co winners, the IPCC, who conclude that sea levels will rise between only a half foot and two feet over this century, with their best expectation being about one foot. That's similar to what the world experienced over the past 150 years.

Likewise, Gore agonizes over the accelerated melting of ice in Greenland and what it means for the planet, but overlooks the IPCC's conclusion that, if sustained, the current rate of melting would add just three inches to the sea level rise by the end of the century. Gore also takes no notice of research showing that Greenland's temperatures were higher in 1941 than they are today.

Gore also frets about the future of polar bears. He claims they are drowning as their icy habitat disappears. However, the only scientific study showing any such thing indicates that four polar bears drowned because of a storm.

The politician turned movie maker loses sleep over a predicted rise in heat related deaths. There's another side of the story that's inconvenient to mention: rising temperatures will reduce the number of cold spells, which are a much bigger killer than heat. The best study shows that by 2050, heat will claim 400,000 more lives, but 1.8 million fewer will die because of cold. Indeed, according to the first complete survey of the economic effects of climate change for the world, global warming will actually save lives.

71

Here's how tree ring dating, known to scientists as dendrochronology (from the Greek roots dendron = tree, and chronos = time), works. If you cut a tree down today, it's straightforward to count the rings inwards, starting from the tree's outside (corresponding to this year's growth ring), and thereby to state that the 177th ring from the outermost one towards the center was laid down in the year 2005 minus 177, or 1828. But it's less straight forward to attach a date to a particular ring in an ancient Anasazi wooden beam, because at first you don't know in what year the beam was cut. However, the widths of tree growth rings vary from year to year, depending on the rain or drought conditions in each year.

Hence the sequence of the rings in a tree cross-section is like a message in Morse code formerly used for sending telegraph messages, dot-dot-dash-dot-dash in the Morse code, wide-wide-narrow-wide-narrow in the tree ring sequence. Actually, the tree ring sequence is even more diagnostic and richer in information than the Morse code, because trees actually contain rings spanning much different width, rather than the Morse code choice between dot and dash.

Tree ring specialists (known as dendrochronologists) proceed by noting the sequence of wider and narrower rings in a tree cut down in a known recent year, and noting the sequences in beams from trees cut down at various times in the past. They then match up and align the tree ring sequences with the same diagnostic wide/narrow patterns from different beams.

In that way, dendrochronologists have constructed tree ring records extending back for thousands of years in some parts of the world. Each record is valid for a geographic area whose extent depends on local weather patterns, because weather and hence tree growth patterns vary with location. For instance, the basic tree ring chronology of the American Southwest applies (with some variation) to the area from Northern Mexico to Wyoming.

A bonus of dendrochronology is that the width and substructure of each ring reflects the amount of rain and the season at which the rain fell during that particular year. Thus, tree ring studies also allow one to reconstruct the past climate, e.g., a series of wide rings means a very wet period, and a series of narrow rings means a drought. Tree rings thereby provide southwestern archaeologists with uniquely exact dating and uniquely detailed year-to-year environmental information.

72

Spurred by the sense that disorderly behavior among students in South Euclid was increasing, the school resource officer (SRO) reviewed data regarding referrals to the principal's office. He found that the high school reported thousands of referrals a year for bullying and that the junior high school had recently experienced a 30 percent increase in bullying referrals. Police data showed that juvenile complaints about disturbances, bullying, and assaults after school hours had increased 90 percent in the past 10 years.

A researcher from Kent State University (Ohio) conducted a survey of all students attending the junior high and high school. Interviews and focus groups were conducted with student identified as victims or offender teachers, and guidance counselors. Finally, the South Euclid Police Department purchased a Geographic Information System to conduct crime incident mapping of hotspots within the schools. The main findings pointed to four primary areas of concern: the environmental design of the school; Teacher knowledge of and response to the problem; parental attitudes and responses and student perspectives and behaviors.

The SRO worked in close collaboration with a social worker and the university researcher. They coordinated a Response Planning Team comprising many stakeholders that was intended to respond to each of the areas identified in the initial analysis. Environmental changes included modifying the school schedule and increasing teacher supervision of hotspots. Counselors and social workers conducted teacher-training courses in conflict resolution and bullying prevention. Parent education included mailings with information about bullying, an explanation of the new school policy, and a discussion about what could be done at home to address the problems. Finally, student education included classroom discussions between homeroom teachers and students, as well as assemblies conducted by the SRO. The SRO also opened a substation next to a primary hotspot. The Ohio Department of Education contributed by opening a new training center to provide a nontraditional setting for specialized help.

The results from the various responses were dramatic. School suspensions decreased 40 percent. Bullying incidents dropped 60 percent in the hallways and 80 percent in the gym area. Follow-up surveys indicated that there were positive attitudinal changes among students about bullying and that more students felt confident that teachers would take action when a problem arose. Teachers indicated that training sessions were

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helpful and that they were more likely to talk about bullying as a serious issue. Parents responded positively, asking for more information about the problem in future mailings. The overall results suggest that the school environments were not only safer, but that early intervention was helping at-risk students succeed in school (South Euclid (Ohio) Police Department, 2001).



73

The history of marketers seeking the advice of physicists is a short one, but an understanding of the Theory of Resonance may give communications experts the edge. Resonance Theory explains the curious phenomenon of how very small pebbles dropped into a pond can create bigger waves than a large brick. The brick makes a decent splash but its ripples peter out quickly. A tiny pebble dropped into the same pond, followed by another, then another, then another, all timed carefully, will create ripples that build into small waves.

As Dr Carlo Contaldi, a physicist at Imperial College London, explains, a small amount of energy committed at just the right intervals the 'natural frequency' creates a cumulatively large effect.

Media consultant Paul Bay believes that just as with the pebbles in a pond, a carefully choreographed and meticulously timed stream of communication (a monthly ad in MT, for example) will have a more lasting effect than a sporadic big splash during primetime ad breaks.

Innocent is testament to the power of pebbles. Until last year, the maker of smoothies had never advertised on TV, instead drip feeding the market with endless ingenious marketing ploys from annotating its drinks labels with quirky messages to hosting its own music festival, Fruitstock. The company sent a constant stream of messages rather than communicating through the occasional big and expensive noise.

So whether you're trying to make waves in the laboratory or in the media, the people in white coats would advise a little and often. A big budget is not the prerequisite of success. Intelligent planning and execution are.

74

Human remains are a fundamental part of the archaeological record, offering unique insights into the lives of individuals and populations in the past. Like many archaeological materials human remains require distinctive and specialised methods of recovery, analysis and interpretation, while technological innovations and the accumulation of expertise have enabled archaeologists to extract ever greater amounts of information from assemblages of skeletal material. Alongside analyses of new finds, these advances have consistently thrown new light on existing collections of human remains in museums, universities and other institutions. Given the powerful emotional, social and religious meanings attached to the dead body, it is perhaps unsurprising that human remains pose a distinctive set of ethical questions for archaeologists.

With the rise of indigenous rights movements and the emergence of post-colonial nations the acquisition and ownership of human remains became a divisive and politically loaded issue. It became increasingly clear that many human remains in museum collections around the world represented the traces of colonial exploitation and discredited pseudo-scientific theories of race. In the light of these debates and changing attitudes, some human remains were returned or repatriated to their communities of origin, a process which continues to this day. Recently a new set of challenges to the study of human remains has emerged from a rather unexpected direction: the British government revised its interpretation of nineteenth-century burial legislation in a way that would drastically curtail the ability of archaeologists to study human remains of any age excavated in England and Wales. This paper examines these extraordinary events and the legal, political and ethical questions that they raise.

In April 2008 the British government announced that, henceforth, all human remains archaeologically excavated in England and Wales should be reburied after a two-year period of scientific analysis. Not only would internationally important prehistoric remains have to be returned to the ground, removing them from public view, but also there would no longer be any possibility of long-term scientific investigation as new techniques and methods emerged and developed in the future. Thus, while faunal remains, potsherds, artefacts and environmental samples could be analysed and re-analysed in future years, human remains were to be effectively removed from the curation process. Archaeologists and other scientists were also concerned that this might be the first step towards a policy of reburial of all human remains held in museum collections in England and Wales including prehistoric, Roman, Saxon, Viking and Medieval as well as more recent remains.

75

We live in an ageing world. While this has been recognized for some time in developed countries, it is only recently that this phenomenon has been fully acknowledged. Global communication is "shrinking" the world, and global ageing is "maturing" it. The increasing presence of older persons in the world is making people of all ages more aware that we live in a diverse and multigenerational society. It is no longer possible to ignore ageing, regardless of whether one views it positively or negatively.

Demographers note that if current trends in ageing continue as predicted, a demographic revolution, wherein the proportions of the young and the old will undergo a historic crossover, will be felt in just three generations. This portrait of change in the world's population parallels the magnitude of the industrial revolution traditionally considered the most significant social and economic breakthrough in the history of humankind since the Neolithic period. It marked the beginning of a sustained movement towards modern economic growth in much the same way that globalization is today marking an unprecedented and sustained movement toward a "global culture". The demographic revolution, it is envisaged, will be at least as powerful.

While the future effects are not known, a likely scenario is one where both the challenges as well as the opportunities will emerge from a vessel into which exploration and research, dialogue and debate are poured. Challenges arise as social and economic structures try to adjust to the simultaneous phenomenon of diminishing young cohorts with rising older ones, and opportunities present themselves in the sheer number of older individuals and the vast resources societies stand to gain from their contribution.

This ageing of the population permeates all social, economic and cultural spheres. Revolutionary change calls for new, revolutionary thinking, which can position policy formulation and implementation on sounder footing. In our ageing world, new thinking requires that we view ageing as a lifelong process.

76

Jobs generated by Travel & Tourism are spread across the economy in retail, construction, manufacturing and telecommunications, as well as directly in Travel & Tourism companies. These jobs employ a large proportion of women, minorities and young people are predominantly in small and medium sized companies and offer good training and transferability. Tourism can also be one of the most effective drivers for the development of regional economies. These patterns apply to both developed and emerging economies.

There are numerous good examples of where Travel & Tourism is acting as a catalyst for conservation and improvement of the environment and maintenance of local diversity and culture. Travel & Tourism creates jobs and wealth and has tremendous potential to contribute to economically, environmentally and socially sustainable development in both developed countries and emerging nations. It has a comparative advantage in that its start up and running costs can be low compared to many other forms of industry development.

It is also often one of the few realistic options for development in many areas. Therefore, there is a strong likelihood that the Travel & Tourism industry will continue to grow globally over the short to medium term.

77

Skipping breakfast seems a simple way of losing weight or saving time while getting the children ready for school or rushing off to work. But it can also be a sign of an unhealthy lifestyle with potentially dangerous consequences, including a higher risk of premature death. According to a study, adults and teenagers who miss the first meal of the day are less likely to look after their health. They tend to smoke more, drink more alcohol and take less exercise than those who do eat. Those who skip food in the morning are also more likely to be fatter and less well-educated, meaning they find it harder to get a job.

Researcher Dr. Anna Keski-Rahkonen said: Smoking, infrequent exercise, a low level of education, frequent alcohol use and a high body mass index were all associated with skipping breakfast in adults and adolescents. Our findings suggest this association exists throughout adulthood. Individuals who skip breakfast may care less about their health than those who eat breakfast.

Previously, experts assumed that missing breakfast often called the most important meal of the day was simply the marker of a hectic life or a way to try to lose weight. But Dr. Keski-Rahkonen, who led the study at Helsinki University, said the results revealed starting the day without food suggests an unhealthy lifestyle.

78

Compulsory voting is often suggested as a solution to the problem of declining turnout. But how are individuals and countries affected by compulsory voting beyond boosting electoral participation? Shane Singh investigates the social, economic, and political consequences of compelling citizens to vote.

There has been a lot of discussion about compulsory voting these days. In the United Kingdom, in particular, as voter turnout rates have declined, many commentators and politicians have begun advocating for mandatory electoral participation. Those in favour of compulsory voting often adduce the importance of participation among all segments of society. Citizens of democracies are forced to do many things in the interest of the public good, they maintain, including serving on juries and educating their children, and full participation serves the country as whole. Those opposed to compulsory voting often argue that, from a democratic theory perspective, the right to vote implicitly includes a right not to vote. Such a right of abstention, they argue, is more important than any societal good that might accompany high turnout. In fact, opponents of compulsory voting often contend that the country may be better off if those who are disinclined to vote are not pushed to participate in public affairs.

Regardless of whether one of these sets of arguments is more persuasive than the other, compulsory voting is commonly used around the world. Several European democracies mandate voting, as do Australia and most of the countries in Latin America. By evaluating results from these countries, it is possible to assess the mechanics and effects of compulsory voting.

79

He is the man who has changed the world more than anyone else in the past hundred years. Sir Tim Berners-Lee may be a mild-mannered academic who lives modestly in Boston, Along with Galileo, William Caxton and Sir Isaac Newton, he is a scientist who has altered the way people think as well as the way they live.

Since the web went global 20 years ago, the way we shop, listen to music and communicate has been transformed. There are implications for politics, literature, economics even terrorism because an individual can now have the same access to information as the elite. Society will never be the same.

The computer scientist from Oxford, who built his own computer from a television screen and spare parts after he was banned from one of the university computers, is a cultural guru as much as a technological one.

It is amazing how far we've come, he says. But you're always wondering what the next crazy idea is, and working to make sure the web stays one web and that the internet stays open. There isn't much time to sit back and reflect.

We speak for more than an hour about everything from Facebook to fatwas, Wikipedia to Google. He invented the web, he says, because he was frustrated that he couldn't find all the information he wanted in one place. It was an imaginary concept that he realized.

The World Wide Web invented by invented by Tim Berners-Lee. It changes the way people shop and listen to music. It also changed economic political and terrorism because it makes people have the same opportunities to assess information.

80

Ethics is a set of moral obligations that define right and wrong in our practices and decisions. Many professions have a formalized system of ethical practices that help guide professionals in the field. For example, doctors commonly take the Hippocratic Oath, which, among other things, states that doctors "do no harm" to their patients. Engineers follow an ethical guide that states that they "hold paramount the safety, health, and welfare of the public." Within these professions, as well as within science, the principles become so ingrained that practitioners rarely have to think about adhering to the ethic – it's part of the way they practice. And a breach of ethics is considered very serious, punishable at least within the profession (by revocation of a license, for example) and sometimes by the law as well.

Scientific ethics calls for honesty and integrity in all stages of scientific practice, from reporting results regardless to properly attributing collaborators. This system of ethics guides the practice of science, from data collection to publication and beyond. As in other professions, the scientific ethic is deeply integrated into the way scientists work, and they are aware that the reliability of their work and scientific knowledge in general depends upon adhering to that ethic. Many of the ethical principles in science relate to the production of unbiased scientific knowledge, which is critical when others try to build upon or extend research findings. The open publication of data, peer review, replication, and collaboration required by the scientific ethic all help to keep science moving forward by validating research findings and confirming or raising questions about results (see our module Scientific Literature for further information).

Some breaches of the ethical standards, such as fabrication of data, are dealt with by the scientific community through means similar to ethical breaches in other disciplines – removal from a job, for example. But less obvious challenges to the ethical standard occur more frequently, such as giving a scientific competitor a negative peer review. These incidents are more like parking in a no parking zone – they are against the rules and can be unfair, but they often go unpunished. Sometimes scientists simply make mistakes that may appear to be ethical breaches, such as improperly citing a source or giving a misleading reference. And like any other group that shares goals and ideals, the scientific community works together to deal with all of these incidents as best as they can – in some cases with more success than others.

81

San (sǎn), people of SW Africa (mainly Botswana, Namibia, Angola, and South Africa), consisting of several groups and numbering about 100,000 in all. They are generally short in stature; their skin is yellowish brown in color; and they have broad noses, flat ears, bulging foreheads, and prominent cheekbones. The San have been called Bushmen, but the term is considered derogatory.

Once nomadic hunters and gatherers of wild food in desolate areas like the Kalahari Desert of SW Africa, most of the San now live in settlements and work on cattle ranches or farms. This transition sometimes has been forced by government policies; legal and physical obstacles in Botswana, including the setting aside of San ancestral land in reserves, have frustrated San who wish seek to live traditionally and led to court cases. San life historically centered on the small hunting band as the main social unit, with larger organizations being loose and temporary. Caves and rock shelters were used as dwellings, and they possessed only what they can carry, using poisoned arrowheads to fell game and transporting water in ostrich-egg shells. The San have a rich folklore, are skilled in drawing, and have a remarkably complex language characterized by the use of click sounds, related to that of the Khoikhoi.

For thousands of years the San lived in S and central Africa; genetic evidence suggests that they and the Khoikhoi were isolated from others humans from c.100, 000 years ago until c.3,000 years ago. At the time of the Portuguese arrival in the 15th cent., however, they had been forced into the interior of S Africa. In the 18th and 19th cent., they resisted the encroachment on their lands of Dutch settlers, but by 1862 that resistance had been crushed.

82

A democratic country should have the right to decide whether to vote or not. It is strange that after decades of crawling up the political backside of the US, Australians don't have that right. Being fined for not voting reminds me of the old saying "you can lead a horse to water but you cannot make him drink". The fine is not for failing to vote but for failing to have your name marked off a list! Forcing people to make a decision just means they'll make the easiest, quickest decision they can, not the best one. You need an informed electorate for compulsory voting to work. However, the reality is that nobody knows anything about the candidates and promotional material is not readily available. I'd rather 80% of people didn't vote than have them all just pick the first recognisable name on the ballot sheet. Then at least the government is elected by the 20% who care and make informed decisions. Otherwise it is largely pot chance who gets elected. Furthermore, compulsory voting doesn't ensure that the entire electorate is engaged in the democratic process. Those who don't want to vote can simply turn up and get their name marked off, without even putting pencil to paper. But you're seriously deluding yourself if you think that this is what all those who don't care about government do when they turn up to the polling booth. Voluntary voting at least ensures those who vote are the ones that care enough to do so. Perhaps somebody could enlighten me as to the reason why, to the best of my knowledge, Australia is the only 'democracy' that has compulsory voting. It is certainly not compulsory in the USA, England, Canada, and New Zealand, Philippines or any other European or Asian democracy that I am aware of. Compulsory voting is, however, mandatory in most communist regimes.

83

Contrary to popular belief, babies under a few months don't grin at you because they're copying your own smile, according to new research. Many studies have indicated that from birth, infants imitate the behaviors and facial expressions of the adults around them. However, a team of Australian, South African and British researchers have released a study this week that refutes this widespread belief.

"Numerous studies from the 1980s and 90s indicated no imitation by newborns, while others claimed it was there," says Virginia Slaughter, a biologist at the University of Queensland and co-author of the study.

"We wanted to clear up the confusion because the 'fact' that newborns imitate is widely cited, not just in the fields of psychology, neuroscience and pediatrics, but also in popular sources for parents."

The international research team, led by Janine Oostenbroek, a psychologist at the University of York in the UK, exposed more than 100 infants to a broad range of gestures and recorded their responses at one, two, six and nine weeks of age.

The gestures included social cues like adults poking their tongues out, frowning or grinning, as well as non-social cues such as pointing or opening a box. The findings showed no link between behaviors exhibited by babies in their first few months and the gestures they were exposed to. The babies were just as likely to exhibit gestures they had never seen before as repeat ones they had. For instance, babies stuck their tongues out just as frequently if they were being exposed to pointing or opening a box, rather than anything to do with mouths or tongues.

84

Asda has become the first food retailer in the country to measure how much customers can save by cutting back on food waste, thanks to a Knowledge Transfer Partnership (KTP) with the University of Leeds. The idea behind the KTP was for the university, using Asda's customer insight data, to apply its research to identify, investigate and implement ways of helping customers to reduce their food waste. This was one of the first times that a major retailer had tried to deliver large-scale sustainability changes, with the two-year project seen as a way for Asda to position themselves as true innovators in this area.

The campaign focused on providing customers with advice on everything from food storage and labelling, to creative recipes for leftovers. Meanwhile, in-store events encouraged customers to make changes in their own homes. In fact, two million customers have said they will make changes to how they deal with food waste in their own homes, leading to an average saving of 57 pounds per customer, as well as a reduction in waste.

A key aspect of a KTP is that an associate is employed by the University to work in the firm and help deliver the desired outcomes of the KTP. As part of the collaboration with Asda, Laure Babbs was given the task of driving forward the sustainability changes in the retailer. As result of the success of her work, Laura eventually became a permanent member of the team at Asda.

85

According to researchers, the invisibility cloak illusion stems from the belief that we are much more socially observant than the people around us. This means that, while we watch and wonder about other people as much as possible, we often think that people around us are less aware. This illusion occurs because, while we are fully aware of our own impressions and speculations about other people, we have no idea what those other people are thinking unless they close to share with us, something that rarely happens except in exceptional circumstances.

To better understand what is happening, it is important to consider the groundbreaking research by Amos Tversky and Daniel Kahneman on cognitive biases. When people make judgments about other people in social situations, they often depend on specific biases such as the availability heuristic, i.e., that we attach more significance to thoughts that come to mind easily. This is why we consider thoughts about other people as being more important than thoughts about inanimate objects. And so, as we look around us, we tend to focus our thoughts on the people we see and what they happen to be doing. Which is why people-watching can be so addictive.

What adds to the sense that we are relatively invisible to others is that people tend to be as discreet as possible about their people-watching. Just because other people aren't sharing their observations with us, it's easy to pretend that they are not as observant as we are. Of course, people many share their people-watching observations with anyone they happen to be with but, for the most part, that only applies to something remarkable enough to comment on. For most of us, what we are seeing tends to be extremely private and not to be shared with others.

86

With a good system of crop rotation, and especially with the addition of any sort of fertilizer you may be able to come up with, it's possible to grow crops on a plot of land for upwards of 2-3 years at a time with good results. Ultimately, though, you must let the land rest if you hope to continue farming there in the long-run. Allowing a plot of land to rest for a period of time is known as letting the field go fallow, and there are several reasons for this.

Allowing a field or plot to lie fallow means that you don't grow anything new on it, don't harvest anything and don't graze any animals on the land for at least a year. Sometimes a field will lay fallow for two, three or even four years, but the traditional standard on many farms was to let a field lie fallow once every 2-3 years.

This fallow period allows the land to replenish many of its nutrients. The root networks of various grasses or groundcovers (like clover) have a chance to expand and grow, which further strengthens the soil and protects it from erosion.

During the fallow period, there are many beneficial flora and micro-fauna, including cyanobacteria, which live in the soil. These microorganisms continue to be active at the root level, steadily improving the quality of the soil so that when you come back in a year or two, you can begin planting food or cash crops anew.

87

Getting to know fellow academics, especially more senior ones, can be very daunting. Lecturers and researchers are used to spending a lot of time in isolation working independently. The thought of going public and “selling yourself” does not seem enticing. However, it is easier than you think to begin to develop your own career-enhancing networks. Your PhD supervisor and examiners or if you are already in post, your mentor, are a great place to start. They will have been chosen to guide you because they are more experienced, and, in most cases, they will work close to your field of interest. Ask their advice for ways of building up your own network of contacts. Also it is easier to approach someone unknown to you if you can mention the name of a mutual acquaintance.

If you are a postgraduate who is serious about a career in academia, or a more senior scholar wanting to develop one, you will surely be attending conferences on a fairly regular basis. There is no right or wrong number of these, some scholars stick to one or two a year, others seem to attend one a month! Conferences are the main way that academics network with each other, so do not miss out on these opportunities. If you are presenting a paper it gives others a chance to see what you are working on, and the informal sections of the programme (such as food and drink breaks) encourage mingling and further discussion.

88

The world is shrinking rapidly with the advent of faster communication, transportation, and financial flows. Products developed in one country—Gucci purses, Sony electronics, McDonald’s hamburgers, Japanese sushi, German BMWs—have found enthusiastic acceptance in other countries. It would not be surprising to hear about a German businessman wearing an Italian suit meeting an English friend at a Japanese restaurant who later returns home to drink Russian vodka and watch *Dancing with the Stars* on TV.

International trade has boomed over the past three decades. Since 1990, the number of multinational corporations in the world has grown from 30,000 to more than 63,000. Some of these multinationals are true giants. In fact, of the largest 150 “economies” in the world, only 81 are countries. The remaining 69 are multinational corporations. Walmart, the world’s largest company, has annual revenues greater than the GDP of all but the world’s 21 largest countries.

Between 2000 and 2008, total world trade grew more than 7 percent per year, easily out-stripping GDP output, which was about 3 percent. Despite a dip in world trade caused by the recent worldwide recession, the world trade of products and services last year was valued at more than \$12 trillion, about 17 percent of GDP worldwide.

Many U.S. companies have long been successful at international marketing: McDonald’s, Coca-Cola, Starbucks, GE, IBM, Colgate, Caterpillar, Boeing, and dozens of other American firms have made the world their market. In the United States, names such as Sony, Toyota, Nestlé, IKEA, Canon, and Nokia have become household words. Other products and services that appear to be American are, in fact, produced or owned by foreign companies.

89

Fish are being killed, and prevented from reaching maturity, by the litter of plastic particles finding their way into the world's oceans, new research has proved.

Some young fish have been found to prefer tiny particles of plastic to their natural food sources, effectively starving them before they can reproduce. The growing problem of microplastics – tiny particles of polymer-type materials from modern industry – has been thought for several years to be a peril for fish, but the study published on Thursday is the first to prove the damage in trials.

Microplastics are near-indestructible in natural environments. They enter the oceans through litter, when waste such as plastic bags, packaging and other convenience materials are discarded. Vast amounts of these end up in the sea, through inadequate waste disposal systems and sewage outfall.

Another growing source is microbeads, tiny particles of hard plastics that are used in cosmetics, for instance as an abrasive in modern skin cleaners. These easily enter waterways as they are washed off as they are used, flushed down drains and forgotten, but can last for decades in our oceans.

The impact of these materials has been hard to measure, despite being a growing source of concern. Small particles of plastics have been found in seabirds, fish and whales, which swallow the materials but cannot digest them, leading to a build-up in their digestive tracts.

For the first time, scientists have demonstrated that fish exposed to such materials during their development show stunted growth and increased mortality rates, as well as changed behaviour that could endanger their survival.

90

Mammals can be one of the hardest-hit groups by habitat loss, and a lot of research has been carried out to find the best ways to conserve mammal diversity.

Much of this research has focused on very large-scale changes in land use and the impacts this will have on overall mammal diversity. However, many important decisions about land use are made at much more local scales, for example at the level of individual landowners.

Now, in a detailed study led by Imperial College London that looked at mammal diversity across different small-scale landscapes in Borneo, researchers have identified previously logged forests as an overlooked source of refuge for mammals.

These 'selectively logged' forests, where only certain tree species are removed, are often considered to be degraded and are frequently cleared to make way for plantations. The new results, published in the journal *Ecological Applications*, suggest they should be better protected.

The team recorded mammals using trap-and-release techniques and motion-sensing cameras over three years, creating an unprecedented 20,000 records of species in three land-use types: old-growth forest, logged forest and oil palm plantation.

To their surprise, they found that mammal diversity for large mammals, like the clouded leopard and civets, was similar for both old-growth forests and logged forests. For small mammals, such as squirrels and rodents, the diversity was actually higher in logged forests.

91

According to the theory of continental drift, the world was made up of a single continent through most of geologic time. That continent eventually separated and drifted apart, forming into the seven continents we have today. The first comprehensive theory of continental drift was suggested by the German meteorologist Alfred Wegener in 1912. The hypothesis asserts that the continents consist of lighter rocks that rest on heavier crustal material—similar to the manner in which icebergs float on water. Wegener contended that the relative positions of the continents are not rigidly fixed but are slowly moving—at a rate of about one yard per century.

According to the generally accepted plate-tectonics theory, scientists believe that Earth's surface is broken into a number of shifting slabs or plates, which average about 50 miles in thickness. These plates move relative to one another above a hotter, deeper, more mobile zone at average rates as great as a few inches per year. Most of the world's active volcanoes are located along or near the boundaries between shifting plates and are called plate-boundary volcanoes.

The peripheral areas of the Pacific Ocean Basin, containing the boundaries of several plates, are dotted with many active volcanoes that form the so-called Ring of Fire. The Ring provides excellent examples of plate-boundary volcanoes, including Mount St. Helens.

However, some active volcanoes are not associated with plate boundaries, and many of these so-called intra-plate volcanoes form roughly linear chains in the interior of some oceanic plates. The Hawaiian Islands provide perhaps the best example of an intra-plate volcanic chain, developed by the northwest-moving Pacific plate passing over an inferred “hot spot” that initiates the magma-generation and volcano-formation process.

92

A farming technique practised for centuries by villagers in West Africa, which converts nutrient-poor rainforest soil into fertile farmland, could be the answer to mitigating climate change and revolutionising farming across Africa.

A global study by researchers has for the first-time identified and analysed rich fertile soils found in Liberia and Ghana. They discovered that the ancient West African method of adding charcoal and kitchen waste to highly weathered, nutrient poor tropical soils can transform the land into enduringly fertile, carbon-rich black soils which the researchers dub 'African Dark Earths'.

Similar soils created by Amazonian people in pre-Columbian eras have recently been discovered in South America — but the techniques people used to create these soils are unknown. Moreover, the activities which led to the creation of these anthropogenic soils were largely disrupted after the European conquest.

Encouragingly researchers in the West Africa study were able to live within communities as they created their fertile soils. This enabled them to learn the techniques used by the women from the indigenous communities who disposed of ash, bones and other organic waste to create the African Dark Earths.

93

A plunging oil price has dragged UK inflation to zero over recent months. But analysts say the fall in retail prices cannot solely be attributed to oil.

Discount retailers continue to steal market share from established industry giants, taking an increased chunk of both food and non-food markets. And, as retail analyst Nick Bubb notes, “the big supermarkets have had to respond to this by bringing down their own ‘rip off’ prices”. The result is a sector-wide fall in prices paid at the till.

The growth of online retailers has also brought prices down, in part due to the ease with which customers can compare prices and purchase goods elsewhere if they find an item cheaper on a competitor’s site. Retailers are also reluctant to offer different prices in their physical and online stores, according to retail analyst Richard Hyman, which means shops are forced to cut prices on the high street. An ever-expanding range of shops is also to blame, according to Mr. Hyman. “Overcapacity is the biggest of the issues affecting prices,” he says. “In the last 10 years, online alone has added the equivalent of 110m square feet of trading space — that’s roughly equal to 65 additional Westfield London shopping malls. An increase in supply of retailers, with no increase in demand, has left the industry massively oversupplied.”

94

Some "moments" seem more important in hindsight than they were at the time. David Day, for example, looks at John Curtin's famous "Australia looks to America" statement of December 1941, a moment remembered as embodying a fundamental shift in Australia's strategic alliance away from Britain towards the US. As Day points out, the shift to the US as our primary ally was a long, drawn-out process which occurred over half a century. Curtin's statement is iconic - it represents and symbolizes the shift - but in and of itself it made almost no difference. Russell McGregor makes similar arguments with regard to the 1967 referendum, falsely hailed in our memories as a huge advance in Aboriginal rights.

There are many other important events which our contributors examine - the campaign to save the Franklin River; the landings at Gallipoli, the discovery of gold in 1851, the disastrous Premiers' Plan designed to cope with the Great Depression, to name just a few.

Taken together, our contributors show that narrative approaches to Australian history are not as simple as might be imagined. There is of course the issue of what should be included and what should not be - what, after all, makes a moment or an event sufficiently important to be included in an official narrative? Just as importantly, the moments and events that are included in narrative histories are open to multiple interpretations.

We hope this collection will provide an important reminder to those wanting to impose a universal history curriculum for our schoolchildren, and indeed a lesson to all Australians wishing to understand their nation's past; History is never simple or straightforward, and it always resists attempts to make it so.

95

Madeline Gannon is a researcher, teacher at the Carnegie Mellon University School of Architecture and Ph.D. candidate in Computational Design — but that's not all. She is on a mission to open up the infinite design possibilities of 3D printing to the world.

Currently you have to have a lot of technical background in order to participate in creating things for 3D printers, Gannon says. There is still a huge knowledge barrier for how we create digital models.

As the technology has advanced, prices have plummeted, and now anyone can buy a 3D printer for a few hundred dollars, Gannon notes. However, not just anyone can create original designs for 3D printed artefacts.

To put true creative power into the hands of any ordinary 3D printer owner, Gannon has developed an innovative new system called “Tactum.”

Design within Reach: Tactum is a new type of software that lets users create their own unique designs for 3D printers by simply touching a projected image. Using their innate hand gestures, someone using Tactum can poke, rub and otherwise manipulate the projected image that will become their 3D printed object, and see it instantly change shape in response. In keeping with the goal of democratizing the process, Gannon designed her first series of Tactum artefacts on a surface that everyone can access freely and manipulate instinctively, that being the human body. My goal was to bring the digital out to the physical world and out onto your body, says Gannon.

Along with a companion project called Reverb — which translates these user-created designs into printable meshes — that impulse has resulted in a spectacular diversity of bracelet and necklace designs, ranging from smooth landscapes, intricate textures and chaotic free forms to delicate geometries derived from the 19th century art of chronograph.

96

The end of the Cretaceous Period saw one of the most dramatic mass extinctions the Earth has ever seen. The fossil record shows that throughout their 160 million year existence, dinosaurs took on a huge variety of forms as the environment changed and new species evolved that were suited to these new conditions. Others that failed to adapt went extinct.

But then 66 million years ago, over a relatively short time, dinosaurs disappeared completely (except for birds). Many other animals also died out, including pterosaurs, large marine reptiles, and other sea creatures such as ammonites.

Although the number of dinosaur species was already declining, this suggests a sudden catastrophic event sealed their fate, causing unfavourable changes to the environment more quickly than dinosaurs and other creatures could adapt.

The exact nature of this catastrophic event is still open to scientific debate. The catastrophe could have been an asteroid impact, volcanic eruptions or the effect of both, together with more gradual changes in the Earth's climate over millions of years.

Whatever the causes, the huge extinction that ended the age of the dinosaur left gaps in the ecosystem that were subsequently filled by mammals and birds, allowing them to evolve rapidly.

97

About 120,000 types of protein molecules have yielded up their structures to science. That sounds a lot, but it isn't. The techniques, such as X-ray crystallography and nuclear-magnetic resonance (NMR), which are used to elucidate the structures as not yet work on all proteins. Some types are hard to produce or purify in the volumes required. Others do not seem to crystallise at all—a prerequisite for probing them with X-rays. As a consequence, those structures that have been determined include who are less than a third of the 16,000 known protein families. Researchers can build reasonable computer models for another third, because the structures of these resemble ones already known. For the remainder, however, there is nothing to go on.

In addition to this lack of information about protein families, there is a lack of information about those from the species of most interest to researchers: Homo sapiens. Only a quarter of known protein structures are human. A majority of the rest come from bacteria. This paucity is a problem, for in proteins form and function are intimately related. A protein is a chain of smaller molecules, called amino acids, that is often hundreds or thousands of links long. By a process not well understood, this chain folds up, after it has been made, into a specific and complex three-dimensional shape. That shape determines what the protein does: acting as a channel, say, to admit a chemical into a cell; or as an enzyme to accelerate a chemical reaction; or as a receptor, to receive chemical signals and pass them on to a cell's molecular machinery.

98

In recent months, drought and overgrazing in northern Kenya have sent thousands of herders and their livestock into national parks and other protected areas, intensifying tensions over land and grazing. Violence has taken the lives of several rangers, and a surge in wildlife killings is devastating Populations of one of East Africa's most majestic beasts: giraffes. "This affects all wildlife, but giraffes may be particularly hard hit," says Fred Bercovitch, a zoologist at Kyoto University in Japan and director of Save the Giraffes, a non-profit in San Antonio, Texas.

For hunters, "giraffes are an easy target," he notes. And as scientists have recognized only, giraffes have multiple species, and several populations are already in serious decline. In the past 30 years, populations of two East African varieties, the Nubian and reticulated giraffes, have plunged by 97% and 78%, respectively, and the International Union for the Conservation of Nature may soon declare them critically endangered, says Doherty, who is involved in the assessment and leads the Reticulated Giraffe Project, a joint Initiative with the Kenya Wildlife Service. In response to the threat, he and other scientists are stepping up research on the animals' birth and survival rates, movements, and interactions with resources and landscapes, hoping to pinpoint risks and focus conservation efforts.

99

Malaria parasites leave a trail of destruction in an infected person's body. The microscopic invaders massacre red blood cells, produce harmful chemicals, and sometimes damage the brain. A new mouse study suggests that the parasites can also be weaken bones. If they do the same in People, they could stunt the growth of children infected with the disease. But the study also provides some good news, identifying a potential way to prevent the skeletal decline with a compound similar to vitamin D. "It's important work," says parasitologist Regina Joice Cordy of Emory University in Atlanta, who wasn't connected to the study. "It's taken us a step further," she adds, in understanding the long-term effects of malaria infections.

Malaria parasites, which are transmitted in the bite of an infection mosquito, cause the most destruction during the part of their life cycle when they dwell in red blood cells circulating through the body. There, they reproduce and feast on oxygen-carrying hemoglobin proteins, after releasing the blood cells, killing them in droves. After researchers have also detected the parasites in bone marrow, where blood-forming stem cells reside, no one has known until now whether they damage the skeleton.



100

The connection between international environmental law and policy and developments at a national level is becoming significantly closer. In the past two decades, many developed countries have greatly increased the number of statutes enacted to address environmental matters. This growth can be seen, in part, as a reflection of the number of international conventions being negotiated multilaterally and bilaterally. In the last five years, there also has been an increasing trend for developing countries and countries whose economies are in transition to introduce environmental legislation. This growth in the number of conventions and the consequential increase in environmental statutes on the same subjects is not surprising, given that conventions almost invariably place obligations on signatory countries to take steps, legal and otherwise, to implement their provisions. As a result of the increasing awareness of environmental problems at a national level, more national environmental law will be written, with similar approaches taken to similar problems. Greater similarity will also be encouraged by the fact that the law of developed countries is very often used as precedential material for the drafting of legislation in developing countries. Furthermore, homogenisation of legislative approaches is encouraged by the publication of model legislation being developed by secretariats of international environmental conventions. For example, the Basel Convention Secretariat has published a comprehensive set of model national provisions on the movement of hazardous wastes. Finally, with more training programmes being conducted for lawyers and others by UNEP, UNDP and IUCN, common legislative approaches are often promoted.

The connection between international environmental law and policy and developments at a national level is becoming significantly closer, and law of developed countries is very often used as precedential material for the drafting of legislation in developing countries, furthermore, homogenisation of legislative approaches is encouraged by the publication of model legislation being developed by secretariats of international environmental conventions.

101

To bring fresh water to the city, his hydraulic engineer, Eugene Belgrand, built a new aqueduct to bring clean water from the Vanne River in Champagne, and a new huge reservoir near the future Parc Montsouris. These two works increased the water supply of Paris from 87000 to 400000 cubic meters of water a day. He laid hundreds of kilometers of pipes to distribute the water throughout the city, and built a second network, using the less-clean water from the Ourq and the Seine, to wash the streets and water the new park and gardens. The population of Paris had doubled since 1815, with no increase in its area. To accommodate the growing population and those who would be forced from the centre by the new boulevards and squares Napoleon III planned to build; he issued a decree annexing eleven surrounding communes, and increasing the number of arrondissements from twelve to twenty, which enlarged the city to its modern boundaries. Beginning in 1854, in the centre of the city, Haussmann's workers tore down hundreds of old buildings and cut eighty kilometers of new avenues, connecting the central points of the city. Buildings along these avenues were required to be the same height and in a similar style, and to be faced with cream-colored stone, creating the signature look of Paris boulevards.

Napoleon III also wanted to build new parks and gardens for the recreation and relaxation of the Parisians, particularly those in the new neighbourhoods of the expanding city. Napoleon III's new parks were inspired by his memories of the parks in London, especially Hyde Park, what he had strolled and promenaded in a carriage while in exile; but he wanted to build on a much larger scale. Working with Haussmann and Jean- Charles Alphand, the engineer who headed the new Service of Promenades and Plantations, he laid out a plan for four major parks at the cardinal points of the compass around the city. Thousands of workers and gardeners began to dig lakes, build cascades, plant lawns, flower beds, trees, and construct chalets and grottoes. Napoleon III created the Bois de Boulogne (1852 - 1858) to the west of Paris; the Bois de Vincennes (1860-1865) to the east; the Parc des Buttes-Chaumont (1865-1867) to the north, and Parc Montsouris (1860-1865) to the south.

102

It was once assumed that all living things could be divided into two fundamental and exhaustive categories. Multicellular plants and animals, as well as many unicellular organisms, are eukaryotic—their large, complex cells have a well-formed nucleus and many organelles. On the other hand, the true bacteria are prokaryotic cell, which are simple and lack a nucleus. The distinction between eukaryotes and bacteria, initially defined in terms of subcellular structures visible with a microscope, was ultimately carried to the molecular level. Here prokaryotic and eukaryotic cells have many features in common. For instance, they translate genetic information into proteins according to the same type of genetic coding. But even where the molecular processes are the same, the details in the two forms are different and characteristic of the respective forms. For example, the amino acid sequences of various enzymes tend to be typically prokaryotic or eukaryotic. The differences between the groups and the similarities within each group made it seem certain to most biologists that the tree of life had only two stems. Moreover, arguments pointing out the extent of both structural and functional differences between eukaryotes and true bacteria convinced many biologists that the precursors of the eukaryotes must have diverged from the common ancestor before the bacteria arose.

Although much of this picture has been sustained by more recent research, it seems fundamentally wrong in one respect. Among the bacteria, there are organisms that are significantly different both from the cells of eukaryotes and from the true bacteria, and it now appears that there are three stems in the tree of life. New techniques for determining the molecular sequence of the RNA of organisms have produced evolutionary information about the degree to which organisms are related, the time since they diverged from a common ancestor, and the reconstruction of ancestral versions of genes. These techniques have strongly suggested that although the true bacteria indeed form a large coherent group, certain other bacteria, the archaebacteria, which are also prokaryotes and which resemble true bacteria, represent a distinct evolutionary branch that far antedates the common ancestor of all true bacteria.

103

It was once believed that the brain was independent of metabolic processes occurring elsewhere in the body. In recent studies, however, we have discovered that the production and release in brain neurons of the neurotransmitter serotonin (neurotransmitters are compounds that neurons use to transmit signals to other cells) depend directly on the food that the body processes.

Our first studies sought to determine whether the increase in serotonin observed in rats given a large injection of the amino acid tryptophan might also occur after rats ate meals that change tryptophan levels in the blood. We found that, immediately after the rats began to eat, parallel elevations occurred in blood tryptophan, brain tryptophan, and brain serotonin levels. These findings suggested that the production and release of serotonin in brain neurons were normally coupled with blood-tryptophan increases. In later studies we found that injecting insulin into a rat's bloodstream also caused parallel elevations in blood and brain tryptophan levels and in serotonin levels. We then decided to see whether the secretion of the animal's own insulin similarly affected serotonin production. We gave the rats a carbohydrate-containing meal that we knew would elicit insulin secretion. As we had hypothesized, the blood tryptophan level and the concentrations of tryptophan serotonin in the brain increased after the meal.

104

We see stars all around, so why doesn't their combined light add up to make our night sky—and surrounding space, for that matter—bright? German physicist Heinrich Wilhelm Olbers put the same puzzle this way in 1823: If the universe is infinite in size, and stars (or galaxies) are distributed throughout this infinite universe, then we are certain to eventually see a star in any direction we look. As a result, the night sky should be aglow. Why isn't it?

In fact, the answer is far more profound than it appears. There have been many attempts at explaining this puzzle, dubbed Olbers' Paradox, over the years. One version implicated dust between stars and perhaps between galaxies. The idea was that the dust would block the light from faraway objects, making the sky dark. In reality, however, the light falling on the dust would eventually heat it up so that it would glow as brightly as the original sources of the light.

Another proposed answer for the paradox held that the tremendous red shift of distant galaxies—the lengthening of the wavelength of light they emit due to the expansion of the universe—would move light out of the visible range into the invisible infrared. But if this explanation were true, shorter, wavelength ultraviolet light would also be shifted into the visible range—which doesn't happen.

105

Prior research suggests that women involved in politics focus primarily on different policy concerns than men and are more likely than men to take part in informal, grass-roots activities, while citing altruistic and civic aims as reasons for participation.

However, a recent study published in the American Journal of Political Science by a University of Michigan political scientist finds that female activists differ little from their male counterparts, many of whom engage in policy issues of more general concern at the national level for rewards that are largely material.

"We expected to find gender differences among activists in terms of the activities in which they specialize, the gratifications they reap from taking part, and the issues that animate their participation," says Nancy Burns, U- M assistant professor of political science. "Probe as we might, we were surprised to find much more similarity than difference between men and women on all these dimensions."

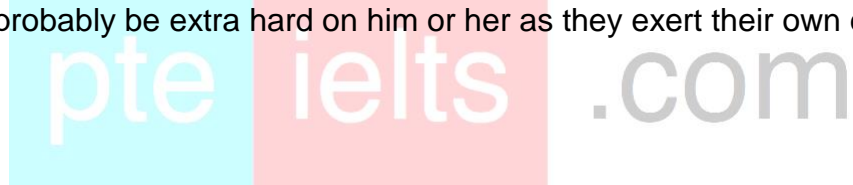
"Contrary to expectation, we find no statistically significant gender difference in how importantly issues involving basic human needs, children or youth, the environment, or crime or drugs figure in issue-based participation," the researchers say. They add, however, that men are slightly more likely to mention taxes (15 percent of men vs. 12 percent of women) and foreign policy (8 percent of men vs. 5 percent of women) as compelling concerns for taking part in politics.

Women, on the other hand, are more likely to cite education (7 percent of women vs. 7 percent of men) as primary reasons for participating in political activities.

106

So, just how does your order of birth affect your parenting? One typical force at work is the tendency for a parent to over identify with the child in the same birth-order position. This can lead to putting too much pressure on the child or spoiling or favouring the child. When I interacted with our first three children while they were growing up, whose antics did I enjoy the most? Kevin II — our baby, of course. For example, when Holly was 13 and Krissy was 11 and they would complain to me about 7- year-old Kevey and his pestering ways, I would say, "Well, girls, let's remember he's the baby of the family. Little baby brothers do that kind of thing to sisters." I identified with Kevin. Do you think Holly and Krissy picked up on that? You bet they did.

In my case, I was over identifying with my lastborn in an indulging way because, as a baby of the family myself, I loved to pester my older sisters and brother when I was small. But let me be clear that over identification can also be done in a non-indulgent, hard-line way, particularly when both parents are firstborns. This almost guarantees that the parents will have what I call "the critical eye." Instead of overindulging their firstborn child, they'll probably be extra hard on him or her as they exert their own exacting standards.



107

Scientists have worked for many years to unravel the complex workings of the brain. Their research efforts have greatly improved our understanding of brain function. During the past decade alone, scientific and technical progress in all fields of brain research has been astonishing. Using new imaging techniques, scientists can visualize the human brain in action. Images produced by these techniques have defined brain regions responsible for attention, memory, and emotion. A series of discoveries (in multiple fields of study) has displaced the long-standing assumption that brain cells are stable and unchanging. Amazingly, new findings show that some adult brain cells can divide and grow! In addition, advances in research are allowing scientists to analyze and make progress toward understanding the causes of inherited brain disorders such as Alzheimer's disease and Parkinson's disease. Taken together, these discoveries provide hope for the recovery of nervous system function lost through injury or disease.

Despite these and other significant advances in the field of brain research, most of the processes responsible for the integrated functioning of billions of brain cells remain a mystery. Research on the brain in the new millennium is crucial to our effort to come to a complete understanding of this fascinating organ. In turn, improved understanding makes the development of new treatment options possible. Research continues to bring new insights into how the brain is put together, how it works, and whether damage to the brain can be reversed.

108

The suburbs of Las Vegas do not look like the cradle of a revolution. Golden stucco-clad houses stretch for street after identical street, interspersed with gated communities with names such as Spanish Oaks and Rancho Bel Air. The sky is the deepest blue, the desert air is clear and the distant mountains are beautiful. The only sounds are the buzz of a gardener's hedge trimmer and a squeaking baby buggy pushed by a power-walking mother. The bright lights of Sin City seem a very long way away.

Yet these quiet streets are being changed by a movement that is gathering momentum across America and around the world, challenging one of the most fundamental of economic relationships: the way we use and pay for energy. There are now more than 7,000 homes in Nevada fitted with solar panels to generate their own electricity, and the number is rising fast. Just five years ago, residential solar power was still a niche product for the homeowner with a fat wallet and a bleeding heart. Not anymore. Technology, politics and finance have aligned to move it into the mainstream. Solar power has become the fastest-growing energy source in the US.

For decades the electricity industry has been a cautious and conservative business, but the plunging prices of solar panels, down by about two-thirds in the past six years, have woken it up with a bang. Dynamic rooftop solar power companies have entered the market, in the most radical change to electricity supplies since the industry was born in the 19th century. It has been described as the equivalent of the mobile revolution in telephony, or the PC in computing.

109

The soil dwelling fungus 'take-all' inflicts devastating stress to the roots of cereals crops worldwide and is a major disease problem in UK wheat crops. However, recent field trial data from Rothamsted Research, an institute of the BBSRC, has demonstrated that farmers could control this devastating disease by selecting wheat cultivars that reduce take-all build up in the soil when grown as a first wheat.

Wheat is an important staple crop worth 1.6 Billion a year to the UK economy alone. This work funded by the Biotechnology and Biological Sciences Research Council (BBSRC), the Department for the Environment, Food and Rural Affairs (Defra) and the HGCA will help farmers to increase yields, combating global food security and contributing to UK economic growth. Take-all disease, caused by the fungus reduces grain yield and quality and results in an increased amount of residual applied nitrogen fertiliser left in the soil post-harvest. Despite the use of chemical, biological and cultural control methods the take-all fungus is still one of the most difficult pathogens of wheat to control. The risk of take-all infection in second and third wheat crops is directly linked to the amount of fungus remaining in the soil after the first wheat is harvested.

The Rothamsted Research study, published in Plant Pathology, has demonstrated that wheat cultivars differ in their ability to build-up the take-all fungus.

Growing a low building cultivar, such as Cadenza, as a first wheat crop can be used to manipulate take-all inoculum levels in the soil resulting in better yields from the second and third wheat crops. Yield increases of up to 2 tonnes per hectare in second wheats have been observed.

110

Promoting active lifestyles can help us address some of the important challenges facing the UK today. Increasing physical activity has the potential to improve the physical and mental health of the nation, reduce all-cause mortality and improve life expectancy. It can also save money by significantly easing the burden of chronic disease on the health and social care services. Increasing cycling and walking will reduce transport costs, save money and help the environment. Fewer car journeys can reduce traffic, congestion and pollution, improving the health of communities. Other potential benefits linked to physical activity in children and young people include the acquisition of social skills through active play (leadership, teamwork and co-operation), better concentration in school and displacement of anti-social and criminal behaviour.

The importance of physical activity for health was identified over 50 years ago. During the 1950s, comparisons of bus drivers with more physically active bus conductors and office-based telephonists with more physically active postmen demonstrated lower rates of coronary heart disease and smaller uniform sizes in the more physically active occupations.

This research led the way for further investigation, and evidence now clearly shows the importance of physical activity in preventing ill health. It is important for us to be active throughout our lives. Physical activity is central to a baby's normal growth and development. This continues through school, and into adulthood and older years. Being physically active can bring substantial benefits and there is consistent evidence of a dose-response relationship, i.e. the greater the volume of physical activity undertaken, the greater the health benefits that are obtained.

111

As warmer winter temperatures become more common, one way for some animals to adjust is to shift their ranges northward. But a new study of 59 North American bird species indicates that doing so is not easy or quick -- it took about 35 years for many birds to move far enough north for winter temperatures to match where they historically lived.

For example, black vultures have spread northward in the last 35 years and now winter as far north as Massachusetts, where the minimum winter temperature is similar to what it was in Maryland in 1975. On the other hand, the endangered red-cockaded woodpecker did not alter its range at all despite the warming trend, possibly because it's very specific habitat requirements precluded a range shift. Both of these scenarios could represent problems for birds, La Sorte said. Species that do not track changes in climate may wind up at the limits of their physiological tolerance, or they may lose important habitat qualities, such as favored food types, as those species pass them by. But they also can't move their ranges too fast if the habitat conditions they depend on also tend to lag behind climate.



112

Their trade networks made the Phoenicians rich but also enabled cultural exchange and transfer between East and West in an unprecedented way: the most significant was the spread of the alphabetic script which was adopted all over the Mediterranean.

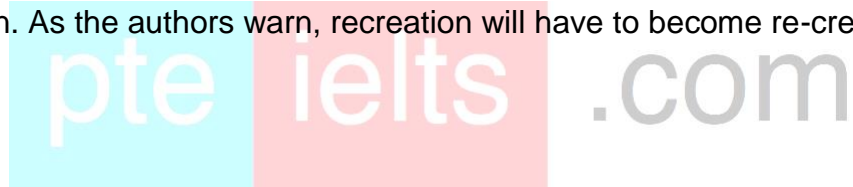
The Phoenician alphabet is a writing system consisting of only 22 signs representing exactly one sound (phoneme) each. The term "alphabet" derives from the names of the first two signs in the sequence, aleph ("cattle") and beit ("house"): these names also reflect the letters' shapes, each derived from the picture of an object whose name starts with the relevant sound.

The alphabetic script is simple enough to learn quickly, without the years of dedicated training required to master writing systems such as cuneiform or Egyptian hieroglyphs. Specialised schooling was unnecessary, and literacy was therefore disengaged from the institutional context of palaces and temples where the traditional scripts continued to be used. The alphabet suited the needs of long-distance merchants who needed to be able to record their business affairs on the go and who, for reasons of confidentiality and money, often preferred to write themselves rather than employ a specialist scribe. As the script could easily be used to record any language, it was, in the course of the first millennium BC, adapted for Aramaic, Hebrew, Greek, Phrygian, Lydian, Etruscan and Latin, to name but a few.

113

Life expectancies have been rising by up to three months a year since 1840, and there is no sign of that flattening. Lynda Gratton and Andrew Scott draw on a 2009 study to show that if the trend continues, more than half the babies born in wealthier countries since 2000 may reach their 100th birthdays. With a few simple, devastating strokes, Gratton and Scott show that under the current system it is almost certain you won't be able to save enough to fund several decades of decent retirement. For example, if your life expectancy is 100, you want a pension that is 50 percent of your final salary, and you save 10 percent of your earnings each year, they calculate that you won't be able to retire till your 80s. People with 100-year life expectancies must recognize they are in for the long haul, and make an early start arranging their lives accordingly.

But how to go about this? Gratton and Scott advance the idea of a multistage life, with repeated changes of direction and attention. Material and intangible assets will need upkeep, renewal or replacement. Skills will need updating, augmenting or discarding, as will networks of friends and acquaintances. Earning will be interspersed with learning or self-reflection. As the authors warn, recreation will have to become re-creation.



114

Let us begin by asking why the conviction that our language is decaying is so much more widespread than the belief that it is progressing. In an intellectual climate where the notion of the survival of the fittest is at least as strong as the belief in inevitable decay, it is strange that so many people are convinced of the decline in the quality of English, a language which is now spoken by an estimated half billion people – a possible hundredfold increase in the number of speakers during the past millennium.

One's first reaction is to wonder whether the members of the anti-slovenliness brigade, as we may call them, are subconsciously reacting to the fast-moving world we live in, and consequently resenting change in any area of life. To some extent this is likely to be true. A feeling that 'fings ain't wot they used to be' and an attempt to preserve life unchanged seem to be natural reactions to insecurity, symptoms of growing old. Every generation inevitably believes that the clothes, manners and speech of the following one have deteriorated. We would therefore expect to find a respect for conservative language in every century and every culture and, in literate societies, a reverence for the language of the 'best authors' of the past.



115

The smallest star yet measured has been discovered by a team of astronomers led by the University of Cambridge. With a size just a sliver larger than that of Saturn, the gravitational pull at its stellar surface is about 300 times stronger than what humans feel on Earth.

The star is likely as small as stars can possibly become, as it has just enough mass to enable the fusion of hydrogen nuclei into helium. If it were any smaller, the pressure at the center of the star would no longer be sufficient to enable this process to take place. Hydrogen fusion is also what powers the Sun, and scientists are attempting to replicate it as a powerful energy source here on Earth.

These very small and dim stars are also the best possible candidates for detecting Earth-sized planets which can have liquid water on their surfaces, such as TRAPPIST-1, an ultracool dwarf surrounded by seven temperate Earth-sized worlds.

The newly-measured star, called EBLM J0555-57Ab, is located about six hundred light years away. It is part of a binary system and was identified as it passed in front of its much larger companion, a method which is usually used to detect planets, not stars. Details will be published in the journal *Astronomy & Astrophysics*.

116

The oral storytelling skills of African American preschoolers make a difference in how quickly their reading skills develop, according to a new study from the Frank Porter Graham Child Development Institute (FPG) at the University of North Carolina at Chapel Hill. Researchers say the effect is much different for girls and boys.

“Knowing how to tell a clear and coherent story is an important skill for helping young children to develop strong reading skills, which, in turn, can help them to be successful across a number of different subjects in school,” said FPG advanced research scientist Nicole Gardner-Neblett. “Prior research suggests that historical and cultural factors foster strong storytelling skills among African American children, which has implications for their development as readers.”

Two years ago, Gardner-Neblett’s own research was the first to demonstrate the connection between African American preschoolers’ storytelling abilities and their early reading skills in kindergarten. That study found a link between storytelling and reading only for the African American children, from households across income levels, but not for any other demographic group.

Stark differences in reading achievement exist between Black and White elementary schoolchildren, as does a gender gap in reading outcomes, with girls outperforming boys. Because of both disparities in achievement, Gardner-Neblett and FPG advanced research scientist John Sideris wanted to better understand if and how gender plays a role in the link between African American children’s storytelling skills and reading development.

117

The greatest climate change the world has seen in the last 100,000 years was the transition from the ice age to the warm interglacial period. New research from the Niels Bohr Institute at the University of Copenhagen indicates that, contrary to the previous opinion, the rise in temperature and the rise in the atmospheric CO₂ follow each other closely in terms of time. The results have been published in the scientific journal, *Climate of the Past*.

In the warmer climate, the atmospheric content of CO₂ is naturally higher. The gas CO₂ (carbon dioxide) is a greenhouse gas that absorbs heat radiation from Earth and thus keeps Earth warm. In the shift between ice ages and interglacial periods, the atmospheric content of CO₂ helps to intensify the natural climate variations.

It had previously been thought that as the temperature began to rise at the end of the ice age approximately 19,000 years ago, an increase in the amount of CO₂ in the atmosphere followed with a delay of up to 1,000 years.

“Our analysis of ice cores from the ice sheet in Antarctica shows that the concentration of CO₂ in the atmosphere follows the rise in Antarctic temperatures very closely and is staggered by a few hundred years at most,” explains Sune Olander Rasmussen, Associate Professor and centre coordinator at the Centre for Ice and Climate at the Niels Bohr Institute at the University of Copenhagen.

118

The Home Office's periodic British Crime Survey estimates that the true level of crime (the sorts, anyway, which inform the official figures) is about four times that which is registered in the annual statistics.

Quite often, especially in the financial services sector, businesses do not report crimes against themselves for fear of lowering their public image. Many citizens today are not insured against car theft or property loss (because they cannot afford the premiums), so they have no incentive to tell the police if they become victims.

A steep statistical rise in crime can sometimes arise not from a real growth in a particular type of conduct but a new policing policy - offences of "lewd dancing" rose by about 300 percent during 12 months in the 1980s in Manchester, but only because the zealous Chief Constable James Anderton had deployed a great many officers in gay nightclubs.

Sometimes the enactment of a new range of offenses or the possibility of committing old offenses in a new way (like computer offenses involving fraud and deception) can cause an upward jolt in crime levels. The figures just released show a startling jump in street robbery but much of this seems to be a very particular crime: the theft of the now ubiquitous mobile phones.

Conversely, if crimes like joyriding and some assaults are kept out of the categories measured in the annual statistics, as is the case, the official figures do not reflect even what is reported to the police as a criminal.

The way that crime statistics are compiled by the Home Office is also relevant. From April 1998, police forces started to count crime in a way which, according to the government, will give "a more robust statistical measure".

Under the new rules, crime is recorded as one crime per victim. Some crimes, like assaults, have always been recorded in this way, so the main impact of the change will be in the area of property offenses. Shop thefts, for example, were the old rules counted offenders, will now count victims. Multiple thefts from cars in a car park with a barrier were previously counted as one offense but are now counted as separate offenses.

119

It might seem a little eccentric, but reviewing your work by reading it aloud can help to identify the woolliest areas. This works best if you perform your reading in a theatrical way, pausing at the commas and ends of sentences. If you run out of breath during a sentence, it is probably too long. You ought to be able to convert your writing into a speech in this way if it sounds too stilted and convoluted, perhaps you could rework these parts until they sound fluid.

It is unlikely that your reader will be fooled by the idea that long words make you sound clever. Cluttering a sentence with too many complicated words can prevent its meaning from being understood at all. A short word is always preferable to a long one. Why should anyone choose the word erroneous over the word wrong in an essay? Usually, writers who employ more obscure words are trying to sound impressive but can appear pretentious. Direct words enable you to control what you are saying, and are not necessarily babyish, but the most appropriate ones for the job.

When you read your writing aloud, you will notice that the key stress comes at the end of your sentence. It is, therefore, most effective to end with a short and emphatic word to secure your point. Try to resist the impulse to waffle at the end of your sentence by trailing off into qualifying clauses. It might be worth relocating the clause to the beginning of the sentence or losing it altogether if you feel that it adds little to its meaning.

Your sentences might be the most grammatically perfect in the world, but still, cause your writing to sound wrong if you have misjudged its tone. A colloquial style, which uses slang and exclamations, is an inappropriately chatty tone for an essay. However, style can be equally jarring if your vocabulary is too formal or ambitious for its context. It is much more impressive to make complicated points using simple language and grammar.

120

One that emerged in the world dominated by the printing press, it is important to distinguish the quality of vividness experienced by television viewers from the vividness experienced by readers. I believe that the vividness experienced in the reading of words is automatically modulated by the constant activation of the reasoning centers of the brain that are used in the process of cocreating the representation of reality the author has intended. By contrast, the visceral vividness portrayed on television has the capacity to trigger instinctual responses similar to those triggered by reality itself and without being modulated by logic, reason, and reflective thought.

The simulation of reality accomplished in the television medium is so astonishingly vivid and compelling compared with the representations of reality conveyed by printed words that it signifies much more than an incremental change in the way people consume information. Books also convey compelling and vivid representations of reality, of course. But the reader actively participates in the conjuring of the reality the book's author is attempting to depict. Moreover, the parts of the human brain that are central to the reasoning process are continually activated by the very act of reading printed words: Words are composed of abstract symbols letters that have no intrinsic meaning themselves until they are strung together into recognizable sequences.

Television, by contrast, presents to its viewers a much more fully formed representation of reality without requiring the creative collaboration that words have always demanded.

121

What makes teaching online unique is that when you teach online, you don't have to be someplace to teach. You don't have to lug your briefcase full of papers or your laptop to a classroom, stand at a lectern, scribble on a chalkboard (or even use your high-tech, interactive classroom smart whiteboard), or grade papers in a stuffy room while your students take a test. You don't even have to sit in your office waiting for students to show up for conferences. You can hold office hours on weekends or at night after dinner. You can do all this while living in a small town in Wyoming or a big city like Bangkok, even if you're working for a college whose administrative offices are located in Florida or Dubai. You can attend an important conference in Hawaii on the same day that you teach your class in New Jersey, logging on from your laptop via the local cafes wireless hot spot or your hotel rooms high-speed network. Or you may simply pull out your smartphone to quickly check on the latest postings, email, or text messages from students, using a mobile app for your course site or to access other resources.

Online learning offers more freedom for students as well. They can search online for courses using the internet, scouring their institutions or even the world for programs, classes, and instructors that fit their needs. Having found an appropriate course, they can enroll and register, shop for their books (whether hard copy or e-books), read articles, listen to lectures, submit their homework assignments, confer with their instructors, and access their final grades all online. They can assemble in virtual classrooms, joining other students from diverse geographical locales, forging bonds and friendships not possible in conventional classrooms, which are usually limited to students from a specific geographical area.

122

Scientists believe they may have found a way to prevent complications that can arise following cataract surgery, the world's leading cause of blindness.

Detailing why complications can occur after surgery, researchers from the University of East Anglia (UEA) explained that while cataract surgery works well to restore vision, a few natural lens cells always remain after the procedure. Over time, the eye's wound-healing response leads these cells to spread across the underside of the artificial lens, which interferes with vision, causing what's known as 'posterior capsule opacification' or secondary cataract.

UEA's School of Biological Sciences academic, Dr Michael Wormstone, who led the study, said: "Secondary visual loss responds well to treatment with laser surgery. But as life expectancy increases, the problems of cataract and posterior capsule opacification will become even greater in terms of both patient wellbeing and economic burden. It's essential that we find better ways to manage the condition in future."

As a result, researchers are designing new artificial lenses that can be placed into a capsular bag that stays open, instead of shrink-wrapping closed, which currently occurs. It is believed that, through the new approach, fluid in the eye can flow around the artificial lens, therefore diluting and washing away the cell-signalling molecules that encourage cell re-growth.

123

How can we design great cities from scratch if we cannot agree on what makes them great? None of the cities where people most want to live — such as London, New York, Paris and Hong Kong — comes near to being at the top of surveys asking which are best to live in.

The top three in the most recent Economist Intelligence Unit's livability ranking, for example, were Melbourne, Vancouver and Vienna. They are all perfectly pleasant, but great? The first question to tackle is the difference between liveability and greatness. Perhaps we cannot aspire to make a great city, but if we attempt to make a liveable one, can it in time become great? There are some fundamental elements that you need. The first is public space. Whether it is Vienna's Ringstrasse and Prater Park, or the beaches of Melbourne and Vancouver, these are places that allow the city to pause and the citizens to mingle and to breathe, regardless of class or wealth. Good cities also seem to be close to nature, and all three have easy access to varied, wonderful landscapes and topographies.

A second crucial factor, says Ricky Burdett, a professor of urban studies at the London School of Economics, is a good transport system. "Affordable public transport is the one thing which cuts across all successful cities," he says.

124

According to the United States Constitution, a presidential election is to be held once every fourth year. The process of electing a President and Vice-President begins long before Election Day. Candidates from both major and minor political parties and independent candidates begin to raise money and campaign at least one year in advance of the general presidential election. In order to officially represent a political party, a candidate must be nominated by that party.

This primary nomination process is a contest that often produces factions within political parties. These divisions impact the policy stances and agendas of the candidates running for nomination as they attempt to garner the support of party leaders and activists. The nominating process officially begins with the first state primaries and caucuses, which usually occur in the month of February of the election year. It is at these local events that voters are given their first chance to participate in electing the nation's next President.

There are many factors that influence who will ultimately become the candidate for a party. The public's perception of the candidates is influenced by such things as media reports, public opinion polls, candidate preference surveys, and advertising. These factors will help determine the perceived strengths and weaknesses of the candidates in the months leading up to the caucuses and primaries.

125

If your recruiting efforts attract job applicants with too much experience a near certainty in this weak labor market you should consider a response that runs counter to most hiring managers MO: Don't reject those applicants out of hand.

Instead, take a closer look. New research shows that overqualified workers tend to perform better than other employees, and they don't quit any sooner. Furthermore, a simple managerial tactic empowerment can mitigate any dissatisfaction they may feel.

The prejudice against too-good employees is pervasive. Companies tend to prefer an applicant who is a perfect fit over someone who brings more intelligence, education, or experience than needed. On the surface, this bias makes sense: Studies have consistently shown that employees who consider themselves overqualified exhibit higher levels of discontent. For example, over-qualification correlated well with job dissatisfaction in a 2008 study of 156 call-center reps by Israeli researchers Saul Fine and Baruch Nevo. And unlike discrimination based on age or gender, declining to hire overqualified workers is perfectly legal.

But even before the economic downturn, a surplus of overqualified candidates was a global problem, particularly in developing economies, where rising education levels are giving workers more skills than are needed to supply the growing service sectors. If managers can get beyond the conventional wisdom, the growing pool of too-good applicants is a great opportunity. Berrin Erdogan and Talya N. Bauer of Portland State University in Oregon found that overqualified workers' feelings of dissatisfaction can be dissipated by giving them autonomy in decision making. At stores where employees didn't feel empowered, over-educated workers expressed greater dissatisfaction than their colleagues did and were more likely to state an intention to quit. But that difference vanished where self-reported autonomy was high.

126

In the past two centuries there has been a dramatic change in the role of food and eating in Australian public consciousness. Public discussion of food was largely confined to matters of supply, distribution and price. Towards the end of the nineteenth century some newspapers were offering regular columns of advice on housekeeping topics, including menu planning and recipes. However, eating remained essentially a private activity, even when undertaken in company.

By the late twentieth century, food and eating had become prominent public preoccupations. Evidence of this dramatic cultural revaluation abounds. In bookstores, for example cookery and all things related to it are often among the larger displays. There are specialty stores selling all manner of cookware, tableware and other paraphernalia associated with food, eating and drinking.

Perhaps most telling is the extension of the phenomenon of mass media celebrity to include culinary personalities. Scholars, too, have jumped on the commodification bandwagon. Now degrees in gastronomy seem set to emulate the MBA phenomenon of the 1980s and food has become a respectable subject for investigation with philosophers, sociologists, historians, cultural theorists, ecologists and many others all having a go at it.

However, surprisingly, the question seems to have held little fascination for most historians. For the best part of two centuries they have managed to write their accounts of colonization and nationhood with only scant reference to how the settlers and their descendants fed themselves.

127

UCLA neurology professor Paul Thompson and his colleagues scanned the brains of 23 sets of identical twins and 23 sets of fraternal twins. Since identical twins share the same genes while fraternal twins share about half their genes, the researchers were able to compare each group to show that myelin integrity was determined genetically in many parts of the brain that are key for intelligence. These include the parietal lobes, which are responsible for spatial reasoning, visual processing and logic, and the corpus callosum, which pulls together information from both sides of the body.

The researchers used a faster version of a type of scanner called a HARDI (high-angular resolution diffusion imaging) —think of an MRI machine on steroids — that takes scans of the brain at a much higher resolution than a standard MRI. While an MRI scan shows the volume of different tissues in the brain by measuring the amount of water present, HARDI tracks how water diffuses through the brain's white matter — a way to measure the quality of its myelin.

"HARDI measures water diffusion," said Thompson, who is also a member of the UCLA Laboratory of Neuro-Imaging. "If the water diffuses rapidly in a specific direction, it tells us that the brain has very fast connections. If it diffuses more broadly, that's an indication of slower signalling, and lower intelligence."

128

When Christopher Columbus arrived at Hispaniola during his first transatlantic voyage in the year A.D. 1492, the island had already been settled by Native Americans for about 5,000 years. The occupants in Columbus's time were a group of Arawak Indians called Tainos who lived by farming, were organized into five chiefdoms, and numbered around half a million (the estimates range from 100,000 to 2,000,000). Columbus initially found them peaceful and friendly, until he and his Spaniards began mistreating them.

Unfortunately for the Tainos, they had gold, which the Spanish coveted but didn't want to go to the work of mining themselves. Hence the conquerors divided up the island and its Indian population among individual Spaniards, who put the Indians to work as virtual slaves, accidentally infected them with Eurasian diseases, and murdered them. By the year 1519, 27 years after Columbus's arrival, that original population of half a million had been reduced to about 11,000, most of whom died that year of smallpox to bring the population down to 3,000.

On October 12, 1492 (the first day he encountered the native people of the Americas), Columbus wrote in his journal: "They should be good servants I, our Lord being pleased, will take hence, at the time of my departure, six natives for your Highnesses." These captives were later paraded through the streets of Barcelona and Seville when Columbus returned to Spain.

From his very first contact with native people, Columbus had their domination in mind. For example, on October 14, 1492, Columbus wrote in his journal, "with fifty men they can all be subjugated and made to do what is required of them." These were not mere words: after his second voyage, Columbus sent back a consignment of natives to be sold as slaves.

Yet in an April, 1493, letter to Luis de Santangel (a patron who helped fund the first voyage), Columbus made clear that the people he encountered had done nothing to deserve ill treatment.

129

In 1815, on the island of Sumbawa in Indonesia, a handsome and long quiescent mountain named Tambora exploded spectacularly, killing a hundred thousand people with its blast and associated tsunamis. No-one living now has ever seen such fury. Tambora was far bigger than anything any living human has experienced. It was the biggest volcanic explosion in ten thousand years—150 times the size of Mount St. Helens, equivalent to sixty thousand Hiroshima-sized atom bombs.

News didn't travel terribly fast in those days. In London, The Times ran a small story—actually a letter from a merchant—seven months after the event. But by this time Tambora's effects were already being felt. Two hundred and forty cubic kilometres of smoky ash, dust and grit had diffused through the atmosphere, obscuring the Sun's rays and causing the Earth to cool. Sunsets were unusually but bleakly colourful, an effect memorably captured by the artist J.M.W. Turner, who could not have been happier, but mostly the world existed under an oppressive, dusky pall. It was this deathly dimness that inspired Byron to write the lines quoted above.

Spring never came and summer never warmed: 1816 became known as the year without summer. Crops everywhere failed to grow. In Ireland a famine and associated typhoid epidemic killed sixty-five thousand people. In New England, the year became popularly known as Eighteen Hundred and Froze to Death. Morning frosts continued until June and almost no planted seed would grow. Short of fodder, livestock died or had to be prematurely slaughtered. In every way it was a dreadful year—almost certainly the worst for farmers in modern times. Yet globally the temperature fell by less than 1 degree Celsius. The Earth's natural thermostat, as scientists would learn, is an exceedingly delicate instrument.

130

Although we tend to think of electric cars as being something completely modern, they were in fact some of the earliest types of motorized vehicle. At the beginning of the twentieth-century electric cars were actually more popular than cars with an internal combustion engine as they were more comfortable to ride in. However, as cars fuelled by petrol increased in importance. Electric cars declined. The situation became such that electric vehicles were only used for certain specific purposes – as fork-lift trucks, ambulances and urban delivery vehicles, for example.

Although electricity declined in use in road vehicles, it steadily grew in importance as a means of powering trains. Switzerland, for example, was quick to develop an electrified train system, encouraged in this no doubt by the fact that it had no coal or oil resources of its own.

Nowadays there is renewed interest in Electricity as a means of powering road vehicles. Why is this case? Well, undoubtedly economic reasons are of considerable importance. The cost of oil has risen so sharply that there is a strong financial imperative to look for an alternative. However, there are also environmental motivations. Emissions from cars re-blamed in large part for – among other things – the destruction of the ozone layer and the resultant rise in temperatures in the Polar Regions. A desire not to let things get any worse is also encouraging research into designing effective electric transport.

131

Here's a term you're going to hear much more often: plug-in vehicle, and the acronym PEV. It's what you and many other people will drive to work in, ten years and more from now.

At that time, before you drive off in the morning you will first unplug your car - your plug-in vehicle. Its big on board batteries will have been fully charged overnight, with enough power for you to drive 50-100 kilometres through city traffic.

When you arrive at work you'll plug in your car once again, this time into a socket that allows power to flow from your car's batteries to the electricity grid. One of the things you did when you bought your car was to sign a contract with your favourite electricity supplier, allowing them to draw a limited amount of power from your car's batteries should they need to, perhaps because of a blackout, or very high wholesale spot power prices. The price you get for the power the distributor buys from your car would not only be most attractive to you, it would be a good deal for them too, their alternative being very expensive power from peaking stations.

If, driving home or for some other reason your batteries looked like running flat, a relatively small, but quiet and efficient engine running on petrol, diesel or compressed natural gas, even biofuel, would automatically cut in, driving a generator that supplied the batteries so you could complete your journey.

Concerns over 'peak oil', increasing greenhouse gas emissions, and the likelihood that by the middle of this century there could be five times as many motor vehicles registered world- wide as there are now, mean that the world's almost total dependence on petroleum-based fuels for transport is, in every sense of the word, unsustainable.

132

According to Dr. Ron Fessenden, M.D., M.P.H. the average American consumes more than 150 pounds of refined sugar, plus an additional 62 pounds of high fructose corn syrup every year. (1) In comparison, we consume only around 1.3pounds of honey per year on average in the U.S. (2) According to new research, if you can switch out your intake of refined sugar and use pure raw honey instead, the health benefits can be enormous.

What is raw honey? It's a pure, unfiltered and unpasteurized sweetener made by bees from the nectar of flowers. Most of the honey consumed today is processed honey that's been heated and filtered since it was gathered from the hive. Unlike processed honey, raw honey does not get robbed of its incredible nutritional value and health powers. It can help with everything from low energy to sleep problems to seasonal allergies. Switching to raw honey may even help weight-loss efforts when compared to diets containing sugar or high fructose corn syrup. I'm excited to tell you more about one of my all-time favorite natural sweeteners today.



133

Water is at the core of sustainable development. Water resources, and the range of services they provide, underpin poverty reduction, economic growth and environmental sustainability. From food and energy security to human and environmental health, water contributes to improvements in social well-being and inclusive growth, affecting the livelihoods of billions.

In a sustainable world that is achievable in the near future, water and related resources are managed in support of human well-being and ecosystem integrity in a robust economy. Sufficient and safe water is made available to meet every person's basic needs, with healthy lifestyles and behaviours easily upheld through reliable and affordable water supply and sanitation services, in turn supported by equitably extended and efficiently managed infrastructure. Water resources management, infrastructure and service delivery are sustainably financed. Water is duly valued in all its forms, with wastewater treated as a resource that avails energy, nutrients and freshwater for reuse. Human settlements develop in harmony with the natural water cycle and the ecosystems that support it, with measures in place that reduce vulnerability and improve resilience to water-related disasters. Integrated approaches to water resources development, management and use – and to human rights – are the norm. Water is governed in a participatory way that draws on the full potential of women and men as professionals and citizens, guided by a number of able and knowledgeable organizations, within a just and transparent institutional framework.

134

Four years ago, Darek Fidyka was stabbed in the back, leaving his spinal cord severed, and his body from the chest down paralyzed. Now, after an experimental treatment, Fidyka has regained some feeling in his lower body and is learning to walk again.

The researchers are looking to use less invasive techniques in the future, because undergoing brain surgery to extract the olfactory tissue isn't anyone's idea of a good time, much less someone who is paralyzed.

The BBC reports that over 100 micro injections of olfactory unsheathing cells were injected into the injury site, and strips of nerve tissue from Fidyka ankle were laid across the gap in the spinal cord, in the hopes that the cells from the olfactory bulbs would encourage regrowth. A similar procedure had been successfully tested on dogs in 2012.

Now, 19 months after the operation, Fidyka has regained sensation in parts of his lower body, and after intense physical therapy is able to walk using a walker. As an added bonus, even with one olfactory bulb removed, Fidyka retained his sense of smell.

He told the BBC: "I think it's realistic that one day I will become independent. What I have learned is that you must never give up but keep fighting, because some door will open in life." The story is the subject of an episode of the BBC television program Panorama airing today at 10:35 pm in the UK. The study itself will be published in the journal Cell Transplantation at a later date, but the researchers acknowledge that as exciting as this result is, there is still a lot more work to be done.

"Our results are very encouraging," the medical team is quoted as saying in a statement. "However, our results need to be confirmed in a larger group of patients with a similar injury. In the meantime, we are investigating surgical techniques for more minimally invasive access to the olfactory bulb."

135

The feature of being “double blind”, where neither patients nor physicians are aware of who receives the experimental treatment, is almost universally trumpeted as being a virtue of clinical trials. Hence, trials that fail to remain successfully double blind are regarded as providing inferior evidential support. The rationale for this view is unobjectionable: double blinding rules out the potential confounding influences of patient and physician beliefs.

Nonetheless, viewing double blind trial as necessarily superior is problematic. For one, it leads to the paradox that very effective experimental treatments will not be supportable by best evidence. If a new drug were to make even the most severe symptoms of the common cold disappear within seconds, most participants and investigators would correctly identify it as the latest wonder drug and not the control (i.e. placebo) treatment. Any trial testing the effectiveness of this wonder drug will therefore fail to remain double blind. Similar problems arise for treatments, such as exercise and most surgical techniques, whose nature makes them resistant to being tested in double blind conditions. It seems strange that an account of evidence should make priori judgments that certain claims can never be supported by ‘best evidence’. It would be different if the claims at issue were pseudoscientific – untestable. But so far as treatments with large effects go, the claim that they are effective is highly testable and intuitively they should receive greater support from the evidence than do claims about treatments with moderate effects.

136

Mexico City, a miner in the state of Chiapas found a tiny tree frog that has been preserved in amber for 25 million years, a researcher said. If authenticated, the preserved frog would be the first of its kind found in Mexico, according to David Grimaldi, a biologist and curator at the American Museum of Natural History, who was not involved in the find.

The chunk of amber containing the frog, less than half an inch long, was uncovered by a miner in Mexico southern Chiapas state in 2005 and was bought by a private collector, who loaned it to scientists for study. A few other preserved frogs have been found in chunks of amber, a stone formed by ancient tree sap, mostly in the Dominican Republic. Like those, the frog found in Chiapas appears to be of the genus Craugastor, whose descendants still inhabit the region, said biologist Gerardo Carbot of the Chiapas Natural History and Ecology Institute. Carbot announced the discovery this week.

The scientist said the frog lived about 25 million years ago, based on the geological strata where the amber was found. Carbot would like to extract a sample from the frog's remains in hopes of finding DNA that could identify the particular species, but doubts the owner would let him drill into the stone.

137

For decades, space experts have worried that a speeding bit of orbital debris might one day smash a large spacecraft in to hundreds of pieces and start a chain reaction, a slow cascade of collisions that would expand for centuries, spreading chaos through the heavens. In the last decade or so, as scientists came to agree that the number of objects in orbit had surpassed a critical mass or, in their terms, the critical spatial density, the point at which a chain reaction becomes inevitable they grew more anxious.

Early this year, after a half-century of growth, the federal list of detectable objects (four inches wide or larger) reached 10,000, including dead satellites, spent rocket stages, a camera, a hand tool and junkyards of whirling debris left over from chance explosions and destructive tests. So our billion dollar of satellites are at risk.



138

Delivering packages with drones can reduce carbon dioxide emissions in certain circumstances as compared to truck deliveries, a new study from University of Washington transportation engineers finds.

In a paper to be published in an upcoming issue of Transportation Research Part D, researchers found that drones tend to have carbon dioxide emissions advantages over trucks when the drones don't have to fly very far to their destinations or when a delivery route has few recipients.

Trucks - which can offer environmental benefits by carrying everything from clothes to appliances to furniture in a single trip - become a more climate-friendly alternative when a delivery route has many stops or is farther away from a central warehouse.

For small, light packages - a bottle of medicine or a kid's bathing suit - drones compete especially well. But the carbon benefits erode as the weight of a package increase since these unmanned aerial vehicles have to use additional energy to stay aloft with a heavy load.



139

Despite the growth of social media, the internet and their central role in modern childhood, traditional bullying — such as name-calling or being excluded by others — remains considerably more common than cyberbullying, according to the largest study of its kind published in The Lancet Child and Adolescent Health journal.

The study estimates that less than 1% of 15-year-olds in England report only being bullied online regularly, while more than one in four (27%) experience only face-to-face bullying methods.

With nine out of 10 of the teenagers who are bullied online also facing regular traditional bullying, the researchers suggest that cyberbullying is an additional tactic in the bullies' arsenal, and that both forms must be tackled together to prevent bullying and improve teenagers' resilience.

Concerns have been raised that cyberbullying has the potential to cause more harm than traditional bullying due to the relative anonymity of perpetrators in many cases, larger audiences, increasing prevalence, and permanence of posted messages. However, in the study, the experience of only cyberbullying was found to have a very small association with well-being and life satisfaction when compared with traditional bullying alone.

140

Firstly, from the macroscopic view, the dominance of English is not precipitated by the language itself, so the arising of English dominance in international communication is not solely the dominance of language itself. Just as the professor Jean Aitchison in Oxford pointed out, the success of a language has much to do with the power of the people who use it but has little to do with internal features of the language. It is very obvious in consideration to English. During the 18th century and 19th century, the influence of the British Empire began to spread around the world for the sake of industrial revolution, so English began to become popular. English was used not only in the British colonies but also in the diplomatic negotiations of non-English-speaking countries.

However, no matter how powerful the adaptively is and how large the area that the power of English covers, currently, the international status of English mainly springs from the status of America as a super power after World War II.

Besides, with the development of the economic globalization and new political structure, there is a great need of an international language. As result, American English became the first choice.

141

What do great managers actually do? There is one quality that sets truly great managers apart from the rest: They discover what is unique about each person and then capitalize on it. Average managers play checkers, while great managers play chess. The difference? In checkers, all the pieces are uniform and move in the same way; they are interchangeable. You need to plan and coordinate their movements, certainly, but they all move at the same pace, on parallel paths. In chess, each type of piece moves in a different way, and you can't play if you don't know how each piece moves. More important, you won't win if you don't think carefully about how you move the pieces. Great managers know and value the unique abilities and even the eccentricities of their employees, and they learn how best to integrate them into a coordinated plan of attack.

First, identifying and capitalizing on each person's uniqueness saves time. No employee, however talented, is perfectly well-rounded. Michelle could have spent untold hours coaching Jeffrey and cajoling him into smiling at, making friends with, and remembering the names of customers, but she probably would have seen little result for her efforts. Her time was much better spent carving out a role that took advantage of Jeffrey's natural abilities.

Second, capitalizing on uniqueness makes each person more accountable. Michelle didn't just praise Jeffrey for his ability to execute specific assignments. She challenged him to make this ability the cornerstone of his contribution to the store, to take ownership for this ability, to practice it, and to refine it.

Third, capitalizing on what is unique about each person builds a stronger sense of team, because it creates interdependency. It helps people appreciate one another's particular skills and learn that their coworkers can fill in where they are lacking. In short, it makes people need one another. The old cliché is that there's no "I" in "team." But as Michael Jordan once said, "There may be no 'I' in 'team,' but there is in 'win.'"

Finally, when you capitalize on what is unique about each person, you introduce a healthy degree of disruption into your world. You shuffle existing hierarchies: If Jeffrey is in charge of all resets and revisions in the store, should he now command more or less respect than an assistant manager? You also shuffle existing assumptions about who is allowed to do what: If Jeffrey devises new methods of resetting an aisle, does he have to ask permission to try these out, or can he experiment on his own? And you shuffle

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existing beliefs about where the true expertise lies: If Genoa comes up with a way of arranging new merchandise that she thinks is more appealing than the method suggested by the “planogram” sent down from Walgreens headquarters, does her expertise trump the planners back at corporate? These questions will challenge Walgreens’ orthodoxies and thus will help the company become more inquisitive, more intelligent, more vital, and, despite its size, more able to duck and weave into the future.



142

The evolution of the RAS (Royal Agricultural Society) fits into the wider Western trend of promoting nationalism, progress and technology through exhibitory venues, which first became popular in the 1850s. Various types of fairs, from local agricultural shows to Worlds Fairs, were used as instruments of hegemony to support imperialism, to promote burgeoning capitalist endeavors, and to shape class identities, social spaces and public spaces. Visual culture and the art of display became essential in defining aspects of national distinction. Colonial nations in particular, such as Canada and Australia, were attempting to develop distinct national identities to differentiate themselves from British imperial power. Agricultural fairs in North America originated at the beginning of the nineteenth century and were devoted to educating practicing framers in ways of improving their cultivation of livestock and crops through the use of various technologies.

In 1822, the RAS was created on the premise that was a dire need in Australia for the development of improved farming skills to better support growing urban populations and export markets. Organizations based on agricultural improvement, which were popular in Britain, provided camaraderie as well as political and financial support for their members. Once transferred to the colonies, in this case Australia, they played an integral part in converting and organizing land for colonial purposes.

143

A government is the organization, machinery, or agency, through which a political unit exercises its authority, controls and administers public policy, and directs and controls the actions of its members or subjects. The government makes laws, regulate economies, conduct relations with other countries, provide infrastructure and services, and maintain an army and a police force amongst others on behalf of the people of the country.

Democracy is any system of government in which the people have the rule. The ancient Greeks used the word democracy to mean government by the many in contrast to government by the few. The key of democracy is that the people hold ultimate power. Abraham Lincoln best captured this spirit by describing democracy as a government of the people, by the people, for the people. Democratic government is opposed to an authoritative government, where the participation of its citizenry is limited or prohibited, and a state of anarchy where no form of government exists.



144

Negotiation is a common process in business to mainly solve business conflicts between both parties. Compromise is a basic negotiation strategy in which both parties give up something that they want in order to get something else they want more. Compromise usually occur in unfair parties when there is a fixed pie to be divided up, and whatever on one side gets, the other side loses. In compromise situations, neither side gets all of what they really want, but they each make concessions in order to reach an agreement that is acceptable to both. Both parties usually can reach win-win concept through compromise.

However, negotiation cannot resolve all the conflict if one party is unwilling to resolve the problem.



145

On a field trip to the Amazon in 1807, 19th-century explorer Alexander von Humboldt witnessed a group of horses lead through a muddy pool filled with electric eels, which he described as dramatically leaping up to attack the intruders. But scientists have doubted the story.

“The first time I read von Humboldt’s tale, I thought it was completely bizarre,” Catania says. “Why would the eels attack the horses instead of swimming away? “But then he observed the same behaviour by accident as he transferred the eels in his lab from one tank to another using a metal-rimmed net. Instead of swimming away, larger eels attacked the net by leaping out of the water.

Catania tracked the strength of the eels’ electric shock by attaching a voltmeter to an aluminium plate, or conductive metal strips to “predator” objects such as a crocodile head replica.

The zap a submerged eel distributes through the water is relatively weak when it reaches the target. But when an eel touches it with its electricity-generating chin, the current travels directly to the target and has to travel through its body before it gets back to the water, Catania reported in Proceedings of the National Academy of Sciences.

“This allows the eels to deliver shocks with a maximum amount of power to partially submerged land animals that invade their territory,” Catania explains. “It also allows them to electrify a much larger portion of the invader’s body.”

Catania found the eels leapt to attack, rather than receded, more often when the water in the aquarium was lower. He argues the attack lets electric eels better defend themselves during the Amazonian dry season, when they’re cornered in small pools and make easy prey.

146

Major athletic events around the globe from the 2014 Sochi Olympics to an annual powerboat race in Norwegian fjords – are striving to neutralize their carbon footprint as part of a world-wide climate network, the United Nations Environment Programme (UNEP) said today. The sporting events are the latest participants to join the network, and are particularly important for inspiring further global action on the environment, said Achim Steiner, UNEP Executive Director. Organizers of the 2014 Sochi Olympic and Paralympic Winter Games – to be held in a unique natural setting between the shores of the Black Sea and the soaring snow-capped Caucasus Mountains say they will put an estimated \$1.75 billion into energy conservation and renewable energy.

That investment will be dedicated to improving transport infrastructure, offsetting greenhouse gas emissions from the use of electricity, air travel and ground transportation, the reforestation of Sochi National Park and the development of green belts in the city.

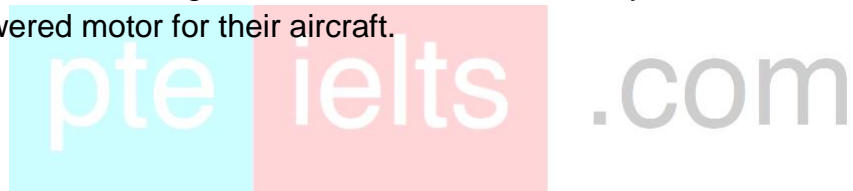


147

Orville and Wilbur Wright were brothers living in Dayton, Ohio. The two had started making bicycles during the 1890s and had a successful small business selling their Wright Specials for \$18 each (\$475 in today's green). This experience with building light, strong machines would prove valuable in the coming years after the brothers' interest turned to flight.

Others in the United States were also developing aircraft at the time the Wright brothers started turning their curiosity skyward. Samuel Langley had flown an unmanned steam-powered aircraft in 1896. Octave Chanute and others were flying gliders near Chicago late in the decade as well. But it wasn't until the Wright brothers started working on the matter that the "flying problem" would finally be solved.

Beginning in 1899, the brothers designed and built a series of gliders to test their various ideas on a flying machine. They constructed a wind tunnel that allowed them to test designs without having to build a full-size model. They even built their own gasoline-powered motor for their aircraft.



148

The ways of life of Upper Palaeolithic people are known through the remains of meals scattered around their hearths, together with many tools and weapons and the debris left over from their making. The people were hunter-gatherers who lived exclusively from what they could find in nature without practising either agriculture or herding. They hunted the bigger herbivores, while berries, leaves, roots, wild fruit and mushrooms probably played a major role in their diet. Their hunting was indiscriminate, perhaps because so many animals were about that they did not need to spare pregnant females or the young. In the cave of Enlène, for example, many bones of reindeer and bison fetuses were found. Apparently, upper Palaeolithic people hunted like other predators and killed the weakest prey first. They did, however, sometimes concentrate on salmon runs and migrating herds of reindeer. Contrary to popular beliefs about 'cave men', Upper Palaeolithic people did not live deep inside caves. They rather chose the foot of cliffs, especially when an overhang provided good shelter. On the plains and in the valleys, they used tents made from hides of the animals they killed. At times, on the great Russian plains, they built huts with huge bones and tusks collected from the skeletons of mammoths.

Men hunted mostly with spears; the bow and arrow was probably not invented until the Magdalenian period that came at the end of the Upper Palaeolithic. Tools and weapons, made out of wood or reindeer antlers, often had flint cutting edges. Flint snappers were skilful and traditions in flint snapping were pursued for thousands of years. This continuity means that they must have been carefully taught how to find good flint nodules and how to knap them in order to make knives, burins (chisel-like tools) or scrapers, which could be used for various purposes.

149

Plants serve as the conduit of energy into the biosphere, provide food and materials used by humans, and they shape our environment. According to Ehrhardt and Frommer, the three major challenges facing humanity in our time are food, energy, and environmental degradation. All three are plant related.

All of our food is produced by plants, either directly or indirectly via animals that eat them. Plants are a source of energy production. And they are intimately involved in climate change and a major factor in a variety of environmental concerns, including agricultural expansion and its impact on habitat destruction and waterway pollution. What's more, none of these issues are independent of each other. Climate change places additional stresses on the food supply and on various habitats. So plant research is instrumental in addressing all of these problems and moving into the future.

For plant research to move significantly forward, Ehrhardt and Former say technological development is critical, both to test existing hypotheses and to gain new information and generate fresh hypotheses. If we are to make headway in understanding how these essential organisms function and build the foundation for a sustainable future, then we need to apply the most advanced technologies available to the study of plant life, they say.

150

Could midday napping save your life? If the experience of Greek men is any guide, the answer just may be yes.

In a study released yesterday, researchers at the Harvard School of Public Health and in Athens reported that Greeks who took regular 30-minute siestas were 37 percent less likely to die of heart disease over a six-year period than those who never napped. The scientists tracked more than 23,000 adults, finding that the benefits of napping were most pronounced for working men.

Researchers have long recognized that Mediterranean adults die of heart disease at a rate lower than Americans and Northern Europeans. Diets rich in olive oil and other heart-healthy foods have received some of the credit, but scientists have been intrigued by the potential role of napping.

The study, published in the Archives of Internal Medicine, concluded that napping was more likely than diet or physical activity to lower the incidence of heart attacks and other life-ending heart ailments. Essentially, they said, sleep at any time of day acts like a valve to release the stress of everyday life. Still, the authors cautioned that further research is needed to confirm their findings. Specialists not involved with the study said there are sound biochemical reasons to believe that a nap may help protect against heart disease.

151

A large new study has found that people who regularly took a siesta were significantly less likely to die of heart disease. "Taking a nap could turn out to be an important weapon in the fight against coronary mortality," said Dimitrios Trichopoulos of the Harvard School of Public Health in Boston, who led the study published yesterday in the Archives of Internal Medicine.

The study of more than 23,000 Greek adults the biggest and best examination of the subject to date found that those who regularly took a midday siesta were more than 30 percent less likely to die of heart disease.

Other experts said the results are intriguing. Heart disease kills more than 650,000 Americans each year, making it the nation's No. 1 cause of death.

"It's interesting. A little siesta, a little snooze may be beneficial," said Gerald Fletcher, a cardiologist at the Mayo Clinic in Jacksonville, Fla., speaking on behalf of the American Heart Association. "It's simple, but it has a lot of promise."

While more research is needed to confirm and explore the findings, there are several ways napping could reduce the risk of heart attacks, experts said. "Napping may help deal with the stress of daily living," said Michael Twery, who directs the National Heart Lung and Blood Institute's National Center on Sleep Disorders Research.

"Another possibility is that it is part of the normal biological rhythm of daily living. The biological clock that drives sleep and wakefulness has two cycles each day, and one of them dips usually in the early afternoon. It's possible that not engaging in napping for some people might disrupt these processes." Researchers have long known that countries such as Greece, Italy and Spain, where people commonly take siestas, have lower rates of heart disease than would be expected. But previous studies that attempted to study the relationship between naps and heart disease have produced mixed results. The new study is first to try to fully account for factors that might confuse the findings, such as physical activity, diet and other illnesses.

152

Live in the country and last three years longer than my city friends? Good news indeed, more backing for a lifestyle choice made half a lifetime ago when it seemed a good idea to exchange an Edinburgh terrace for a farm cottage.

I knew it was a good idea because I had been there before. Born and reared on a farm I had been seduced for a few years by the idea of being a big shot who lived and worked in a city rather than only going for the day to wave at the buses.

True, I was familiar with some of the minor disadvantages of country living such as an iffy private water supply sometimes infiltrated by a range of flora and fauna (including, on one memorable occasion, a dead lamb), the absence of central heating in farm houses and cottages, and a single track farm road easily blocked by snow, broken down machinery or escaped livestock.

But there were many advantages as I told Liz back in the mid-Seventies. Town born and bred, eight months pregnant and exchanging a warm, substantial Corstorphine terrace for a windswept farm cottage on a much lower income, persuading her that country had it over town might have been difficult.

153

Why and to what extent should parents control their children's TV watching? There is certainly nothing inherently wrong with TV. The problem is how much television a child watches and what effect it has on his life. Research has shown that as the amount of time spent watching TV goes up, the amount of time devoted not only to homework and study but other important aspects of life such as social development and physical activities decreases. Television is bound to have it tremendous impact on a child, both in terms of how many hours a week he watches TV and of what he sees. When a parent is concerned about the effects of television, he should consider a number of things: what TV offers the child in terms of information and knowledge, how many hours a week a youngster his age should watch television, the impact of violence and sex, and the influence of commercials.

What about the family as a whole? Is the TV set a central piece of furniture in your home! Is it flicked on the moment someone enters the empty house? Is it on during the daytime? Is it part of the background noise of your family life? Do you demonstrate by your own viewing that television should be watched selectively?



154

Since Australians Jennifer Hawkins and Lauryn Eagle were crowned Miss Universe and Miss Teen International respectively, there has been a dramatic increase in interest in beauty pageants in this country. These wins have also sparked a debate as to whether beauty pageants are just harmless reminders of old fashioned values or a throwback to the days when women were respected for how good they looked. Opponents argue that beauty pageants, whether its Miss Universe or Miss Teen International, are demeaning to women and out of sync with the times. They say they are nothing more than symbols of decline.

In the past few decades Australia has taken more than a few faltering steps toward treating women with dignity and respect. Young women are being brought up knowing that they can do anything, as shown by inspiring role models in medicine such as 2003 Australian of the Year Professor Fiona Stanley.

In the 1960s and 70s, one of the first acts of the feminist movement was to picket beauty pageants on the premise that the industry promoted the view that it was acceptable to judge women on their appearance. Today many young Australian women are still profoundly uncomfortable with their body image, feeling under all kinds of pressures because they are judged by how they look.

Almost all of the pageant victors are wafer thin, reinforcing the message that thin equals beautiful. This ignores the fact that men and women come in all sizes and shapes. In a country where up to 60% of young women are on a diet at any one time and 70% of school girls say they want to lose weight, despite the fact that most have a normal BMI, such messages are profoundly hazardous to the mental health of young Australians.

155

With an abundance of low priced labor relative to the United States, it is no surprise that China, India and other developing countries specialize in the production of labor intensive products. For similar reasons, the United States will specialize in the production of goods that are human and physical capital intensive because of the relative abundance of a highly educated labor force and technically sophisticated equipment in the United States.

This division of global production should yield higher global output of both types of goods than would be the case if each country attempted to produce both of these goods itself. For example, the United States would produce more expensive labor intensive goods because of its more expensive labor and the developing countries would produce more expensive human and physical capital intensive goods because of their relative scarcity of these inputs. This logic implies that the United States is unlikely to be a significant global competitor in the production green technologies that are not relatively intensive in human and physical capital.

Nevertheless, during the early stages of the development of a new technology, the United States has a comparative advantage in the production of the products enabled by this innovation. However, once these technologies become well understood and production processes are designed that can make use of less skilled labor; production will migrate to countries with less expensive labor.

156

In 2005 Japan had the highest median age of all countries in the world, while Australia's population was only moderately aged. Some 50 years ago the demographic situation was quite different, with the median age of Australia's population being seven years older than Japan's.

The ageing of the population is a major issue for Australian policy makers, particularly in regard to the long-term implications for reduced economic growth and the increasing demand for Age Pensions, and health and aged care services. As the population ages, growth in the number of people of working age will slow, while the proportion of people of retirement age will increase.

Sustained population ageing also leads to slowing or negative population growth. While declining population growth in developed countries is welcomed by some environmentalist and social scientists, economists tend to agree that population decline brings gloomy economic prospects. In addition to the decrease in the labour supply, the demand side of the economy may be affected through shrinking markets for goods and services.

How quickly this occurs depends on the dynamics of fertility, mortality and overseas migration. While a moderate pace of demographic change allows for gradual adjustment of the economy and policies to the changing population demographics, rapid changes are more difficult to manage. As a result, governments and society as a whole may need to take actions to address these issues. But how severe is the ageing of Australia's population, relative to other countries?

One way of applying a degree of perspective to the ageing debate is to compare ageing in Australia with that of other countries. This article examines the population structures in Australia and Japan and the demographic forces that shape the respective populations, both historically and projections for the future.