READING

ARTICLES

IELTS PASSAGES

1- Sleepy Students Perform Worse

Staying up an hour or two past bedtime makes it far harder for kids to learn, say scientists who deprived youngsters of sleep and tested whether their teachers could tell the difference. They could. If parents want their children to thrive academically, “Getting them to sleep on time is as important as getting them to school on time," said psychologist Gahan Fallone, who conducted the research at Brown Medical School.

The study, unveiled Thursday at an American Medical Association (AMA) science writers meeting, was conducted on healthy children who had no evidence of sleep- or learning-related disorders. Difficulty paying attention was among the problems the sleepy youngsters faced - raising the question of whether sleep deprivation could prove even worse for people with attention deficit hyperactivity disorder, or ADHD. Fallone now is studying that question, and suspects that sleep problems “could hit children with ADHD as a double whammy”.

Sleep experts have long warned that Americans of all ages do not get enough shuteye. Sleep is important for health, bringing a range of benefits that, as Shakespeare put it, “knits up the ravelled sleave of care”. Not getting enough is linked to a host of problems, from car crashes as drivers doze off to crippled memory and inhibited creativity. Exactly how much sleep correlates with school performance is hard to prove. So, Brown researchers set out to test whether teachers could detect problems with attention and learning when children stayed up late - even if the teachers had no idea how much sleep their students actually got.

They recruited seventy-four 6- to 12-year-olds from Rhode Island and southern Massachusetts for the three-week study. For one week, the youngsters went to bed and woke up at their usual times. They already were fairly good sleepers, getting nine to 9.5 hours of sleep a night. Another week, they were assigned to spend no fewer than ten hours in bed a night. The other week, they were kept up later than usual: First -and second-graders were in bed no more than eight hours and the older children no more than 6.5 hours. In addition to parents’ reports, the youngsters wore motiondetecting wrist monitors to ensure compliance.

Teachers were not told how much the children slept or which week they stayed up late, but rated the students on a variety of performance measures each week. The teachers reported significantly more academic problems during the week of sleep deprivation, the study, which will be published in the journal Sleep in December, concluded. Students who got eight hours of sleep or less a night were more forgetful, had the most trouble learning new lessons, and had the most problems paying attention, reported Fallone, now at the Forest Institute of Professional Psychology.

Sleep has long been a concern of educators. Potter-Burns Elementary School sends notes to parents reminding them to make sure students get enough sleep prior to the school's yearly achievement testing. Another school considers it important enough to include in the school's monthly newsletters. Definitely, there is an impact on students' performance if they come to school tired. However, the findings may change physician practice, said Dr. Regina Benjamin, a family physician in Bayou La Batre, who reviewed the data at the Thursday's AMA meeting. "I don't ask about sleep" when evaluating academically struggling students, she noted. "I'm going to start."

So how much sleep do kids need? Recommended amounts range from about ten to eleven hours a night for young elementary students to 8.5 hours for teens. Fallone insists that his own second-grader get ten hours a night, even when it meant dropping soccer - season that practice did not start until 7:30 — too late for her to fit in dinner and time to wind down before she needed to be snoozing. "It's tough," he acknowledged, but "parents must believe in the importance of sleep."

2- The Brains Business

For those of a certain age and educational background, it is hard to think of higher education without thinking of ancient institutions. Some universities are of a venerable age - the University of bologna was founded in 1088, the University of Oxford in 1096 - and many of them have a strong sense of tradition. The truly old ones make the most of their pedigrees, and those of a more recent vintage work hard to create an aura of antiquity. Yet these tradition-loving (or -creating) institutions are currently enduring a thunderstorm of changes so fundamental that some say the very idea of the university is being challenged. Universities are experimenting with new ways of funding (most notably through student fees), forging partnerships with private companies and engaging in mergers and acquisitions. Such changes ate tugging at the ivy's toots.

This is happening for four reasons. The first is the democratisation of higher educa-tion - “massification". in the language of the educational profession. In the rich world, massification has been going on for some time. The proportion of adults with higher educational qualifications in developed countries almost doubled between l975 and 2000. From 22% to 41%. Most of the rich countries are still struggling to digest this huge growth in numbers. Now massification is spreading to the developing world. China doubled its student population in the late 1990s, and India is trying to follow suit.

The second reason is the rise of the knowledge economy. The world is in the grips of a “soft revolution” in which knowledge is replacing physical resources as the main driver of economic growth. Between 1985 and 1997, the contribution of knowledge-based industries to total value added increased from 51% to 59% in Germany and from 45% to 51% in Britain. The best companies are now devoting at least a third of their investment to knowledge-intensive intangibles such as R&D, licensing, and marketing. Universities are among the most important engines of the knowledge economy. Not only do they produce the brain workers who man it, they also provide much of its backbone, from laboratories to libraries to computer networks.

The third factor is globalisation.. The death of distance is transforming academia just as radically as it is transforming business. The number of people from developed countries studying abroad has doubled over the

past twenty years, to 1.9 million; universities are opening campuses all around the world; and a growing number of countries are trying to turn higher education into an export industry. The fourth is competition. Traditional universities are being forced to compete for students and research grants, and private companies are trying to break into a sector which they regard as “the new health care”. The World Bank calculates that global spending on higher education amounts to $300 billion a year, or 1 % of global economic output. There are more than 80 million students worldwide, and 3.5 million people are employed to teach them or look after them.

All this sounds as though a golden age for universities has arrived. However, inside academia, particularly in Europe, it. does not feel like it. Academics complain and administrators are locked in bad-tempered exchanges with the politicians who fund them. What has gone wrong? The biggest problem is the role of the state. If more and more governments are embracing massification, few of them are willing to draw the appropriate conclusion from their enthusiasm: that they should either provide the requisite hinds (as the Scandinavian countries do) or allow universities to charge realistic fees. Many governments have tried to square the circle through lighter management, but management cannot make up for lack of resources.

What, if anything can be done? Techno-utopians believe that higher education is ripe for revolution. The university, they say, is a hopelessly antiquated institution, wedded in outdated practices such as tenure and lectures, and incapable of serving a new world of mass audiences and just-in-time information. “Thirty wars from now the big university campuses will be relics," says Peter Drucker, a veteran management guru. "I consider the American research university of the past 40 years to be a failure." Fortunately, in his view, help is on the way in the form of Internet tuition and for-profit universities. Cultural conservatives, on the other hand, believe that the best way forward is backward. They think it is foolish to waste higher education on people who would rather study "Seinfeld" than Socrates, and disingenuous to contuse the pursuit of truth with the pursuit of profit.

3- Daydreaming

Everyone daydreams sometimes. We sit or lie down, close our eyes and use our imagination to think about something that might happen in the future or could have happened in the past. Most daydreaming is pleasant. We would like the daydream to happen and we would be very happy if it did actually happen. We might daydream that we are in another person's place, or doing something that we have always wanted to do, or that other people like or admire us much more than they normally do.

Daydreams are not dreams, because we can only daydream if we are awake. Also, we choose what our daydreams will be about, which we cannot usually do with dreams. With many daydreams, we know that what we imagine is unlikely to happen. At least, if it does happen, it probably will not do so in the way we want it to. However, some daydreams are about things that are likely to happen. With these, our daydreams often help us to work out what we want to do, or how to do it to get the best results. So, these daydreams are helpful. We use our imagination to help us understand the world and other people.

Daydreams can help people to be creative. People in creative or artistic careers, such as composers, novelists and filmmakers, develop new ideas through daydreaming. This is also true of research scientists and mathematicians. In fact, Albert Einstein said that imagination is more important than knowledge because knowledge is limited whereas imagination is not.

Research in the 1980s showed that most daydreams are about ordinary, everyday events. It also showed that over 75% of workers in so-called 'boring jobs', such as lorry drivers and security guards, spend a lot of time daydreaming in order to make their time at work more interesting. Recent research has also shown that daydreaming has a positive effect on the brain. Experiments with MRI brain scans show that the parts of the brain linked with complex problem-solving are more active during daydreaming. Researchers conclude that daydreaming is an activity in which the brain consolidates learning. In this respect, daydreaming is the same as dreaming during sleep.

Although there do seem to be many advantages with daydreaming, in many cultures it is considered a bad thing to do. One reason for this is that

when you are daydreaming, you are not working. In the 19th century, for example, people who daydreamed a lot were judged to be lazy. This happened in particular when people started working in factories on assembly lines. When you work on an assembly line, all you do is one small task again and again, every time exactly the same. It is rather repetitive and, obviously, you cannot be creative. So many people decided that there was no benefit in daydreaming.

Other people have said that daydreaming leads to 'escapism' and that this is not healthy, either. Escapist people spend a lot of time living in a dream world in which they are successful and popular, instead of trying to deal with the problems they face in the real world. Such people often seem to be unhappy and are unable or unwilling to improve their daily lives. Indeed, recent studies show that people who often daydream have fewer close friends than other people. In fact, they often do not have any close friends at all.

4- TRICKY SUMS AND PSYCHOLOGY

In their first years of studying mathematics at school, children all over the world usually have to learn the times table, also known as the multiplication table, which shows what you get when you multiply numbers together. Children have traditionally learned their times table by going from '1 times 1 is 1' all the way up to '12 times 12 is 144'.

Times tables have been around for a very long time now. The oldest known tables using base 10 numbers, the base that is now used everywhere in the world, are written on bamboo strips dating from 305 BC, found in China. However, in many European cultures the times table is named after the Ancient Greek mathematician and philosopher Pythagoras (570-495 BC). And so it is called the Table of Pythagoras in many languages, including French and Italian.

In 1820, in his book The Philosophy of Arithmetic, the mathematician John Leslie recommended that young pupils memories the times table up to 25 x 25. Nowadays, however, educators generally believe it is important for children to memorise the table up to 9 x 9, 10 x 10 or 12 x12.

The current aim in the UK is for school pupils to know all their times tables up to 12 x 12 by the age of nine. However, many people do not know them, even as adults. Recently, some politicians have been asked arithmetical questions of this kind. For example, in 1998, the schools minister Stephen Byers was asked the answer to 7 x 8. He got the answer wrong, saying 54 rather than 56, and everyone laughed at him.

In 2014, a young boy asked the UK Chancellor George Osborne the exact same question. As he had passed A-level maths and was in charge of the UK's economic policies at the time, you would expect him to know the answer. However, he simply said, 'I've made it a rule in life not to answer such questions.'

Why would a politician refuse to answer such a question? It is certainly true that some sums are much harder than others. Research has shown that learning and remembering sums involving 6,7,8 and 9 tends to be harder than remembering sums involving other numbers. And it is even harder when 6,7,8 and 9 are multiplied by each other. Studies often find that the hardest sum is 6x8, with 7x8 not far behind. However, even though

7x8 is a relatively difficult sum, it is unlikely that George Osborne did not know the answer. So there must be some other reason why he refused to answer the question.

The answer is that Osborne was being 'put on the spot' and he didn't like it. It is well known that when there is a lot of pressure to do something right, people often have difficulty doing something that they normally find easy. When you put someone on the spot and ask such a question, it causes stress. The person's heart beats faster and their adrenalin levels go up. As a result, people will often make mistakes that they would not normally make. This is called 'choking'. Choking often happens in sport, such as when a footballer takes a crucial penalty. In the same way, the boy's question put Osborne under great pressure. He knew it would be a disaster for him if he got the answer to such a simple question wrong and feared that he might choke. And that is why he refused to answer the question.

5- Care in the Community

'Bedlam' is a word that has become synonymous in the English language with chaos and disorder. The term itself derives from the shortened name for a former 16th century London institution for the mentally ill, known as St. Mary of Bethlehem. This institution was so notorious that its name was to become a byword for mayhem. Patient 'treatment' amounted to little more than legitimised abuse. Inmates were beaten and forced to live in unsanitary conditions, whilst others were placed on display to a curious public as a side-show. There is little indication to suggest that other institutions founded at around the same time in other European countries were much better.

Even up until the mid-twentieth century, institutions for the mentally ill were regarded as being more places of isolation and punishment than healing and solace. In popular literature of the Victorian era that reflected true-life events, individuals were frequently sent to the 'madhouse' as a legal means of permanently disposing of an unwanted heir or spouse. Later, in the mid-twentieth century, institutes for the mentally ill regularly carried out invasive brain surgery known as a 'lobotomy' on violent patients without their consent. The aim was to 'calm' the patient but ended up producing a patient that was little more than a zombie. Such a procedure is well documented to devastating effect in the film 'One Flew Over the Cuckoo's Nest'. Little wonder then that the appalling catalogue of treatment of the mentally ill led to a call for change from social activists and psychologists alike.

Improvements began to be seen in institutions from the mid-50s onwards, along with the introduction of care in the community for less severely ill patients. Community care was seen as a more humane and purposeful approach to dealing with the mentally ill. Whereas institutionalised patients lived out their existence in confinement, forced to obey institutional regulations, patients in the community were free to live a relatively independent life. The patient was never left purely to their own devices as a variety of services could theoretically be accessed by the individual. In its early stages, however, community care consisted primarily of help from the patient's extended family network. In more recent years, such care has extended to the provision of specialist community mental health teams (CMHTs) in the UK. Such teams cover a wide range of services from rehabilitation to home treatment and assessment. In addition, psychiatric

nurses are on hand to administer prescription medication and give injections. The patient is therefore provided with the necessary help that they need to survive in the everyday world whilst maintaining a degree of autonomy.

Often, though, when a policy is put into practice, its failings become apparent. This is true for the policy of care in the community. Whilst back-up services may exist, an individual may not call upon them when needed, due to reluctance or inability to assess their own condition. As a result, such an individual may be alone during a critical phase of their illness, which could lead them to self-harm or even become a threat to other members of their community. Whilst this might be an extreme-case scenario, there is also the issue of social alienation that needs to be considered. Integration into the community may not be sufficient to allow the individual to find work, leading to poverty and isolation. Social exclusion could then cause a relapse as the individual is left to battle mental health problems alone. The solution, therefore, is to ensure that the patient is always in touch with professional helpers and not left alone to fend for themselves. It should always be remembered that whilst you can take the patient out of the institution, you can't take the institution out of the patient.

When questioned about care in the community, there seems to be a division of opinion amongst members of the public and within the mental healthcare profession itself. Dr. Mayalla, practising clinical psychologist, is inclined to believe that whilst certain patients may benefit from care in the community, the scheme isn't for everyone. 'Those suffering moderate cases of mental illness stand to gain more from care in the community than those with more pronounced mental illness. I don't think it's a one-size-fits-all policy. But I also think that there is a far better infrastructure of helpers and social workers in place now than previously and the scheme stands a greater chance of success than in the past.'

Anita Brown, mother of three, takes a different view. 'As a mother, I'm very protective towards my children. As a result, I would not put my support behind any scheme that I felt might put my children in danger... I guess there must be assessment methods in place to ensure that dangerous individuals are not let loose amongst the public but I'm not for it at all. I like to feel secure where I live, but more to the point, that my children are not under any threat.'

Bob Ratchett, a former mental health nurse, takes a more positive view on community care projects. 'Having worked in the field myself, I've seen how a patient can benefit from living an independent life, away from an institution. Obviously, only individuals well on their way to recovery would be suitable for consideration as participants in such a scheme. If you think about it, is it really fair to condemn an individual to a lifetime in an institution when they could be living a fairly fulfilled and independent life outside the institution?'

6- Art or Craft?

Down the centuries, craftsmen have been held to be distinct from artists. Craftsmen, such as woodworkers and plasterers, belonged to their own guild, whilst the artist was regarded as a more solitary being confined to an existence in a studio or attic. In addition, whilst craftsmen could rely on a reasonably steady income, artists were often living such a hand-to-mouth existence that the term 'starving artist' became a byword to describe the impoverished existence of artists generally. Even today, the lifestyles of the craftsman and the artist could not be more different. However, what exactly separates craft from art from both a practical and a philosophical view?

One of the main distinctions between art and craft resides in the nature of the finished product or piece. Essentially, the concept of craft is historically associated with the production of useful or practical products. Art, on the other hand, is not restricted by the confines of practicality. The craftsman's teapot or vase should normally be able to hold tea or flowers while the artist's work is typically without utilitarian function. In fact, the very reason for art and its existence is purely to 'be', hence the furlined teacup created by Dada artist, Meret Oppenheim. The 'cup' as such was quite obviously never intended for practical use any more than a chocolate teapot might have been.

Artistry in craftsmanship is therefore merely a byproduct, since the primary focus is on what something does, not what it is. The reverse is true for art. Artistic products appeal purely at the level of the imagination. As the celebrated philosopher, Kant, stated, 'At its best, art cultivates and expands the human spirit.' Whether the artist responsible for a piece of art has sufficient talent to achieve this is another matter. The goal of all artists nevertheless remains the same: to produce a work that simultaneously transcends the mundane and uplifts the viewer. In contrast, the world of the craftsman and his work remain lodged firmly in the practicality of the everyday world. An object produced by an artist is therefore fundamentally different from the one produced by a craftsman.

Differences between the two disciplines of art and craft extend also to the process required to produce the finished object. The British philosopher R.G. Collingwood, who set out a list of criteria that distinguish art from craft, focused on the distinction between the two disciplines in their 'planning and execution'. With a craft, Collingwood argued, the 'result to be obtained is

preconceived or thought out before being arrived at.' The craftsman, Collingwood says, 'knows what he wants to make before he makes it'. This foreknowledge, according to Collingwood, must not be vague but precise. In fact, such planning is considered to be 'indispensable' to craft. In this respect, craft is essentially different from art. Art is placed by Collingwood at the other end of the creative continuum, the creation of art being described as a process that evolves non-deterministically. The artist is, therefore, just as unaware as anyone else as to what the end product of creation will be, when he is actually in the process of creating. Contrast this with the craftsman who already knows what the end product will look like before he or she has even begun to create it.

Since the artist is not following a set of standard rules in the process of creation, he or she has no guidelines like the craftsman. Whilst the table or chair created by the craftsman, for example, has to conform to certain expectations in appearance and design, no such limitations are imposed on the artist. For it is the artist alone who, through a trial-and-error approach, will create the final object.

The object merely evolves over time. Whereas the craftsman can fairly accurately predict when a product will be finished taking technical procedures into account, the artist can do no such thing. The artist is at the mercy of inspiration alone and quite apart from not being able to have a projected finishing date, may never be able to guarantee that the object will be finished at all. Unfinished symphonies by great composers and works of literature never completed by their authors testify to this.

Having no definite end-goal in mind, the emphasis on the finished product that is true of craftsmanship is placed Instead on the act of creation itself with the artist. The creation of the work of art is an exploration and a struggle and path of discovery for the artist. It could be said that the artist is producing as much for himself as for those who will view the finished product. This act of creation is very distinct from the production of an object that is crafted, therefore. The goal of making craftwork is monetary compensation. Craft is produced for purchase and is essentially a money-generating industry. Any craftsman who followed the artistic approach to creation would soon be out of a job. Craftsmen are expected to deliver, artists are not. This is probably the most fundamental difference that separates the craftsman from the artist.

7- Salvador Dali

Few with even a passing knowledge of the art world are likely not to have heard of Salvador Dali, the eccentric and avant-garde exponent of the Surrealist movement. Love him or loathe him, Dali's work has achieved enduring worldwide fame as his name and work have become virtually synonymous with Surrealism itself. The artist's melting clock image is surely one of the most iconic paintings of the art world, whilst Dali's antics have become the stuff of anecdotes.

Born into a middle-class family in the Catalonian town of Figueres in north-eastern Spain, Dali (or Salvador Felipe Jacinto Dali Domenech, to give him his full name) aimed high from the beginning. In the artist's 1942 autobiography entitled 'The Secret Life of Salvador Dali', the artist wrote: 'At the age of six I wanted to be a cook. At seven I wanted to be Napoleon. And my ambition has been growing steadily ever since.' Such ambition and self-belief matured into full-blown arrogance in later years. An example of this is amply shown on an occasion when the artist felt the examiners of the Madrid Academy he was attending were well below par.

To a degree, his undeniably impressive and precocious talent excused his conceit. He was only 14 when his first works were exhibited as part of a show in Figueres. Then three years later he was admitted to the Royal Academy of Fine Arts of San Fernando, in Madrid. However, it wasn't long before Dali's highly developed sense of self-worth (or conceit, depending on how you view the artist) came to the fore and also affected the course of his life. Believing himself way superior to the Academy tutors, who nevertheless refused to grant him a degree, the rebellious artist left for Paris. There he hoped to avail himself of knowledge that he believed his tutors were not adequate to impart. He soon made the acquaintance of the French surrealists Jean Arp, Rene Magritte and Max Ernst and this would prove a turning point in Dali's artistic life.

Already familiar with the psychoanalytic theories of Sigmund Freud, Dali was to witness how the French surrealists were attempting to capture Freud's ideas in paint. The whole world of the unconscious sublimated into dreams was to become the content of these artists' work and later that of Dali's, too. International acclaim followed shortly after. In 1933 he enjoyed solo exhibitions in Paris and New York City, becoming, as one exhibition curator put it, 'Surrealism's most exotic and prominent figure'. Praise

continued to be heaped on Dali as French poet and critic, Andre Breton, the leader of the Surrealist movement gave the artist his blessing to continue carrying the torch for the artistic movement, writing that Dali's name was 'synonymous with revelation in the most resplendent sense of the word'.

Dali's surrealist paintings were packed with Freudian imagery: staircases, keys, dripping candles, in addition to a whole host of personally relevant symbolism such as grasshoppers and ants that captured his phobias on canvas. Despite Dali's overt adulation for Freud, a meeting with the grandmaster of psychoanalysis proved somewhat unfortunate. On the occasion that Dali met Freud, he proceeded to sketch the latter in earnest. However, something about Dali's fervid attitude must have alarmed the psychoanalyst as he is said to have whispered to others in the room, 'The boy looks like a fanatic.'

Sometimes Dali came across as not only mad but also unintelligible, at least as far as his paintings were concerned. One work, 'The Persistence of Memory', was particularly singled out for the sheer confusion it caused amongst its viewers. Featuring melting clocks, swarming ants and a mollusc that was the deflated head of Dali in disguise, the images were so puzzling that one critic urged readers to 'page Dr. Freud' to uncover the meaning of the canvas. His work was, if nothing else, provocative and powerful.

With the passing years, Dali became ever more infatuated with money, admitting to a 'pure, vertical, mystical, gothic love of cash'. Accordingly, he indiscriminately endorsed a host of products for French and American TV commercials. Fie also never failed to promote himself and displayed increasingly exhibitionist behaviour as time went on. Most notably, he once turned up for a lecture in Paris in a Rolls Royce stuffed with cauliflowers. Fie obviously believed the slogan of one of his advertising campaigns for Braniff Airlines, where he declares 'If you got it, flaunt it.' As a more positive outcome of his love for money, Dali took on increasingly diverse projects, ranging from set design to designing clothes and jewellery. His critics, however, believed that early on in his career his love for money exceeded his dedication to producing great art, resulting in Dali producing 'awful junk' after 1939, according to one art critic.

Despite a lukewarm reception from critics, Dali's public popularity never declined. In 1974, at 70 years old, the Dali Theatre Museum opened in his hometown, Figueres. More of a surrealist happening than a museum, one exhibit was a long black Cadillac that rained inside itself whenever a visitor dropped a coin into the slot. Even today hundreds of thousands of visitors still tour the museum each year. Whatever your opinion of him, at least Dali is unlikely to ever be forgotten.

8- The Beginnings of Art Therapy

Art therapy is a relative newcomer to the therapeutic field. Art therapy as a profession began in the mid-20th century, arising independently in English-speaking and European countries. Many of the early practitioners of art therapy acknowledged the influence of a variety of disciplines on their practices, ranging from psychoanalysis through to aesthetics and early childhood education. However, the roots of art as therapy go back as far as the late 18th century, when arts were used in the 'moral treatment' of psychiatric patients.

It wasn't until 1942, however, that the British artist Adrian Hill coined the term 'art therapy', as he was recovering from tuberculosis in a sanatorium. He discovered that therapeutic benefits could be derived from drawing and painting whilst recovering. Art, he claimed, could become therapeutic since it was capable of 'completely engrossing the mind... releasing the creative energy of the frequently inhibited patient'. This effect, argued Hill, could in turn help the patient as it would 'build up a strong defence against his misfortunes'.

In 1964, the British Association of Art Therapists was founded. Proponents of art therapy fell into one of two categories: those who believed that the therapeutic effect of art lay in its effectiveness as a psychoanalytic tool to assess a patient through their drawings and those who held the belief that art-making was an end in itself, the creative process acting therapeutically on the patient. The two practices, however, were not incompatible, a degree of overlap occurring between the two. A patient, for example, could produce work that could be analysed for content and forms of self-expression but which could also be a creative outlet at the same time.

Who Benefits from Art Therapy

Art therapy in all its forms has proved effective in the treatment of individuals suffering with a wide range of difficulties or disabilities. These include emotional, behavioural or mental health problems, learning or physical disabilities. These include emotional, behaviour or mental health problems, learning or physical disabilities, neurological conditions and physical illness. Therapy can be provided on a group or individual basis according to the clients' needs. Whether the approach adopted by the therapist is oriented towards a psychoanalytic or creative approach, the

effect of therapy is multifold. Partaking in art therapy can raise a patient's self-awareness and enable them to deal with stress and traumatic experience. In addition, art therapy sessions can enhance a patient's cognitive abilities and help the patient enjoy the life-affirming pleasures of making art.

What an Art Therapy Session Involves

Typically, an art therapy session is fundamentally different from an art class in that the individual is encouraged to focus more on their internal feelings and to express them, rather than portray external objects. Although some traditional art classes may ask participants to draw from their imagination, in art therapy the patient's inner world of images, feelings, thoughts and ideas are always of primary importance to the experience. Any type of visual art and medium can be employed in the therapeutic process including painting, drawing, sculpture, photography and digital art.

Art therapy sessions are usually held by skilled and qualified professionals. The presence primarily of the therapist is to be in attendance, guiding and encouraging artistic expression in the patient, in accordance with the original meaning of the word for therapy derived from the Greek word 'therapeia', meaning 'being attentive to'.

The Regulation of Art Therapy

Requirements for those wishing to become an art therapist vary from country to country. In the USA, where entry to the profession is highly regulated, a master's degree in art therapy is essential. In addition, those applying for such a post must have taken courses in a variety of studio art disciplines in order to demonstrate artistic proficiency. On completion of the master's degree, candidates also have to complete a minimum of 1000 hours of direct client contact post-graduation that is approved by the American Art Therapy Association (AATA).

However, whilst entry to the profession is strictly regulated in the USA, the same does not hold true for other countries. The problem is that art therapy is still considered a developing field. As such, until it becomes truly established as a therapy, its practice and application will remain unregulated in many countries for some time yet.

9- 3D Printers

Ever wished you could find a pair of shoes to match your outfit? Fancy a pizza but don't want to go out or wait for your delivery service to arrive? Simple. All you need is a 3D home printer. Whilst admittedly not yet mainstream technology, it is only a matter of time until the 3D printer becomes as much a part of the domestic furniture as the statutory TV or the washing machine. Currently, however, the technology remains firmly in the province of geeks and gadget lovers.

The design of the 3D home printer is nevertheless refreshingly simple. Its components are relatively few, and could theoretically be assembled by anyone with a rudimentary knowledge of mechanics and technological know-how. The 3 main elements of the printer are a metal framework which contains the mechanical part of the printer, a printer control board and a PC. The PC is connected via USB to the printer control board, which in turn is connected to the framework of the printer and attached to the side of the latter. A plastic filament of around 3m m in diameter feeds into the printer from an external source, connecting to the extruder motor inside the printer. During printing, the controlled movement of the extruder motor ensures the correct volume of plastic is used. The extruder motor in turn is connected to a heated extruder or 'hot end' that heats the plastic filament during printing. As the heated plastic emerges or is 'extruded' to use the correct terminology, it cools and is arranged in layers to create a solid 3D model.

In order to move the extruder about in 3D space, there are 3 axes, each controlled by motors. The X-axis motor, located in a midway position on the metal framework of the printer, moves the extruder left and right, using a pulley. The two Z-axis motors, which are located on either side of the heated printing bed, move the entire X-axis up and down via two threaded rods. The heated bed of the printer, which lies directly underneath the hot end of the extruder, is moved back and forth beneath the extruder by the Y-axis motor located underneath the heated bed. The bed is heated to around 70 degrees Celsius to ensure the newly laid plastic does not warp as it cools. Overall control of the printer is effected by the printer control board and the PC which contains the programme of the model that is being printed. Once assembled, in theory it should be possible to print a 3D version of virtually anything. However, comparatively easy as it is to assemble, would-be DIY gadget enthusiasts should be warned that the printer has major technical limitations. The finished product will always

have banding and surface detail remaining as evidence of how the model was laid down. In addition, operators of the printer have to be extremely careful not to knock it whilst the machine is in the process of printing, since this will end up in model distortion. Extreme care also has to be taken in the choice of plastic filament which will ultimately create the structure of the model. Some types of plastic may warp if the temperature is not controlled properly when the melted plastic leaves the nozzle, and later, when it is cooling on the bed. Obviously the 3D model will be the same colour as the plastic filament forming it, but colour limitations can easily be overcome by painting afterwards for a multicolour finish. Another problem is that the plastic structures have to be supported as they are laid down on the heated bed or they will distort or fall away as the plastic cools.

It is virtually certain, however, that such issues will be overcome in the future. The innumerable advantages of 3D printers far outweigh any disadvantages and justify time and resources spent on such technology. Firstly, the product can be produced on the spot within a very short time frame, thereby reducing time and cost of manufacturing by traditional means. Secondly, printing objects on a 3D printer removes the need for storage space of items since whatever is required is printed as and when necessary. Finally, despite expensive set-up costs, in the long run, 3D printing works out far cheaper than normal manufacturing processes since there is no longer a need for labour costs.

However, the 3D printer is still very much in its early stages and can be likened to early home computers which in technological hindsight now seem so cumbersome and slow. So far, early experimentations with the new technology have been impressive but not earth-shattering. Nevertheless, in the future that is all set to change. In fact, the potential of 3D printers is jaw-dropping. The most ambitious plan yet for 3D printing has to be in the military field. If all goes to plan, fighter planes will at some, probably very distant, point in the future carry printers on board that during flight will be capable of printing out other fighter planes to replenish the flying squad. Admittedly, it takes a quantum leap of the imagination to accept that a machine that prints out clothing and pizzas will also be able to print out planes. Sceptics, however, should remember that one of the forerunners to the modern computer, designed in the mid-twentieth century, filled an entire room, So, in theory, if we have come so far in a matter of years then who knows what the future may hold for 3D printers?

10- Nanotechnology: its development and uses

Nanotechnology has been hailed by many as being a twentieth-century miracle of science. Essentially, nanotechnology, a term derived from Greek, translating literally as 'dwarf technology' is, as the origin of its name suggests, engineering at the atomic level. Scientists work with particles of substances known as 'nanoparticles' which may measure no more than 1 nanometre or a billionth of a metre. That's around 40,000 times smaller than the width of the average human hair. Whilst some of these substances derived from carbon compounds are manufactured, others, such as metals, are naturally-occurring or arise as a by-product of another process e.g. volcanic ash or smoke from wood burning. What makes these substances of such scientific interest is that their minute size facilitates medical and technological processes that would otherwise be impossible.

It may be something of a revelation for many of us to learn that nanotechnology - or its concept - is far from cutting-edge science. In fact, nanotechnology as an idea was first referred to in an influential lecture by American physicist, Richard Feynman, as far back as 1959. During the lecture, entitled 'There's Plenty of Room at the Bottom', Feynman outlined the basic concept of nanotechnology. Individual atoms and molecules, he claimed, could in the future be created by a physical process. Such a process, he envisaged, would involve the building of a set of precise tools to build and operate another proportionally smaller set. The building of increasingly minute tools at the microscopic level would in turn produce ultra-microscopic materials, later to become known as 'nanoparticles'.

Strangely, what should have sparked a scientific revolution was then virtually forgotten about for the next 15 years. In 1974, a Japanese scientist, Norio Taniguchi, of the Tokyo University of Science reintroduced Feynman's theory and put a new name to an old concept, referring to the science as 'nanotechnology'. However, it wasn't until nearly a decade later, in the 1980s, that the way was paved for nanotechnology to leave the realm of theoretical science and become reality. Two major scientific developments within a relatively short period were to enable practical application of nanotechnology. The invention of the Scanning Tunnelling Microscope (STM), combined with the discovery of nano-sized particles termed 'fullerenes', were to prove a turning point in nanotechnology.

Fullerenes are derived from carbon molecules and, in common with other nanoparticles, possess chemical and physical properties that are of huge scientific interest. The potential value of fullerenes for medical science was first raised in 2003 and in 2005 when the scientific magazine 'Chemistry and Biology' ran an article describing the use of fullerenes as light-activated antimicrobial agents. Since then, fullerenes have been used for several biomedical applications ranging from X-ray imaging to treating cancer by targeting cancer cells. In addition, these nanoparticles have been used in the manufacture of commercial products, from sunscreen to cosmetics and some food products. Furthermore, nanoparticles of metals, like gold and silver, have been used in environmental clean-ups of oil slicks and other forms of pollution. The remarkable properties of nanoparticles are down to two main factors: their greater surface-to-weight ratio, compared to larger particles which promotes the attachment of substances to their surface, and their minute size which allows them to penetrate cell membranes. These properties are of great benefit, for example in medicine, as drugs to fight cancer or AIDS can be attached to nanoparticles to reach their target cell in the human body.

However, despite the amazing properties attributed to nanoparticles such as fullerenes, nanotechnology has yet to win wider universal acceptance in scientific circles. For the very properties that make nanoparticles so valuable to technology and medical science are also the ones that make them potentially so toxic. Such pro perties are potentially lethal if toxic substances attach themselves to the same nanoparticles, thereby delivering a fatal toxin through the cell membranes into the cells themselves. The toxic effect of these compounds is further increased, since their size permits them to enter the bloodstream and hence the body's major organs. Furthermore, the nanoparticles in themselves are essentially a foreign element being introduced to the body. Unlike foreign elements, such as bacteria, the body has no natural immune system to deal with these ultramicroscopic particles. Scientists have yet to convince the nanotechnology sceptics that the potential side effects of nanoparticles are more than compensated for by the advantages that they confer. It may be, however, that opposition to this technology is no more than a general distrust of scientific innovation. In fact, Urban Wiesing from the University of Tubingen has been quoted as saying 'Many of the risks associated with nanotechnology have at least been encountered in part in other technologies as well.' He also believes that regulations can be put in place to minimise such risks. This is a view echoed by the Fed eral Environment

Agency that proposes that such risks are vastly outweighed by the potential benefits of nanotechnology, in particular for the environment.

11- Driverless cars

Driverless cars may be set to become reality. At least that is, if the executives behind the taxi app, Uber, are to be believed. Currently, Uber is taking its biggest steps yet towards a driver-free world, launching the Uber Advanced Technologies Centre in Pittsburgh. The ultimate goal of this institution is to 'do research and development, primarily in the areas of mapping and vehicle safety and autonomy technology'.

To date, Uber has provided a chauffeur-driven taxi service for American clients. Venturing into the realms of driverless cars is therefore a new direction which will require massive investment. It is indeed a huge leap of faith on Uber's part, since technology has yet to catch up with the idea of a fully autonomous vehicle. On the as well as stay in lane, and maintain a steady cruising seed. In a patchwork fashion such cars could eventually build up to almost full automation and Uber believes that car owners will readily embrace the idea of driverless taxis. In Uber's eyes, current car owners only stand to gain by the introduction of such technology. Hiring a driverless cab means that the client does not have to pay for the cost of the driver in the cab fee. The only cost incurred by clients is for fuel, plus wear and tear. It is certainly an attractive proposition. Uber stands to benefit, too, since employees currently working as taxi drivers will be removed from the company's payroll. Apparently for car drivers and Uber, it is a win-win situation.

Not everyone will benefit however from this technology, the car industry being an obvious example. Not surprisingly, the industry views the concept of selt-driving cars with a sense of growing alarm. Such technology could well prove the death knell for private car ownership. As a result, the industry is dragging its feet over the manufacture and introduction of fully automated vehicles onto the market, due to commercial issues.

The commercial aspect apart, there is also the safety issue. Whilst a fully automated car could respond to most eventualities in the course of a trip, would it be capable of responding to unforeseen events, such as changes in route or unexpected diversions? Evidently legislative authorities are also of this opinion. Currently, no matter how much automation a car has, it still requires a driver with a full licence behind the wheel to drive on public roads. Whilst robot drivers, on the whole, have the upper hand on their human counterparts safety-wise, that still does not guarantee that they will

become legal. As a consortium of researchers put it, 'I self-driving cars cut the roughly 40,000 annual US traffic fatalities in half, the car makers might get not 20,000 thank-you notes, but 20,000 lawsuits.'

Interestingly, Uber are now undertaking an aggressive hiring campaign for taxi drivers to meet the demand for their taxi app. It seems that even Uber is less than confident that driverless taxis will soon become a reality. Whether Uber is backing a doomed campaign or instead is about to bring in a technology that will be universally greeted with positivity and acceptance depends entirely on your viewpoint.

John Reynolds, a Pittsburgh taxi driver, is angry at Uber's attitude on fully automated technology. 'They are completely disregarding individual livelihoods, such as mine, as well as those of big car manufacturers in the pursuit of money. Admittedly things change and we have to roll with the times, but there should be some safeguards in place to protect those potentially affected by the introduction of new technologies. I guess I'm biased, being a taxi driver myself, but it's difficult to see it objectively.'

Susie Greenacre, a redident of Pittsburgh, has no such reservations about driverless cars. 'I'm all for it. Driverless cars have my backing, any day! I hate the stress of rush-hour traffic| I think if I could just hop in a driverless car which would take me anywhere I wanted I would never want to drive again!'

Jason Steiner, a school teacher in a Pittsburgh secondary school, is inclined to agree with Susie. 'Whilst I'm not averse to driving, I would swap the stressful daily commute by car to a driverless one if I had the chance! It just takes the pressure off driving. I would be slightly wary though, of completely dependent on a robot-driven car when it comes to having to react to unexpected obstacles in the road.'

12- Reclaiming the future of aral sea

The Aral Sea gets almost all its water from the Amu and Syr rivers. Over millennium the Amu's course has drifted away from the sea, causing it to shrink. But the lake always rebounded as the Amu shifted back again. Today heavy irrigation for crops such as cotton and rice siphons off much of the two rivers, severely cutting flow into their deltas and thus into the sea. Evaporation vastly outpaces any rainfall, snowmelt or groundwater supply, reducing water volume and raising salinity. The Soviet Union hid the sea's demise for decades until 1985, when leader Mikhail Gorbachev revealed the great environmental and human tragedy. By the late 1980s the sea's level had dropped so much that the water had separated into two distinct bodies: the Small Aral (north) and the Large Aral (south). By 2007 the south had split into a deep western basin, a shallow eastern basin and a small, isolated gulf. The Large Aral's volume had dropped from 708 to only 75 cubic kilometers (km3), and salinity had risen from 14 to more than 100 grams per liter (g/1). The 1991 dissolution of the Soviet Union divided the lake between newly formed Kazakhstan and Uzbekistan, ending a grand Soviet plan to channel in water from distant Siberian rivers and establishing competition for the dwindling resource.

Desiccation of the Aral Sea has wrought severe consequences. Greatly reduced river flows ended the spring floods that sustained wetlands with freshwater and enriched sediment. Fish species in the lakes dropped from 32 to 6 because of rising salinity and loss of spawning and feeding grounds (most survived in the river deltas). Commercial fisheries, which caught 40,000 metric tons of fish in 1960, were gone by the mid-1980s; more than 60,000 related jobs were lost. The most common
remaining lake occupant was the Black Sea flounder, a saltwater fish introduced in the 1970s, but by 2003 it had disappeared from the southern lakes because salinity was more than 70 g/1, double that of a typical ocean. Shipping on the Aral also ceased because the water receded many kilometers from the major ports of Aralsk to the north and Moynak in the south; keeping increasingly long channels open to the cities became too costly. Groundwater levels dropped with falling lake levels, intensifying desertification.

The receding sea has exposed and dried 54,000 square kilometers of seabed, which is choked with salt and in some places laced with pesticides and other agricultural chemicals deposited by runoff from area farming.

Strong windstorms blow salt, dust and contaminants as far as 500 km. Winds from the north and northeast drive the most severe storms, seriously impacting the Amu delta to the south—the most densely settled and most economically and ecologically important area in the region. Afrbome sodium bicarbonate, sodium chloride and sodium sulfate kill or retard the growth of natural vegetation and crops—a cruel irony given that irrigating those crops starves the sea. Health experts say the local population suffers from high levels of respiratory illnesses, throat and esophageal cancer, and digestive disorders caused by breathing and ingesting salt-laden air and water. Liver and kidney ailments, as well as eye problems, are common. The loss of fish has also greatly reduced dietary variety, worsening malnutrition and anemia, particularly in pregnant women.

Returning the entire Aral Sea to its 1960s state is unrealistic. The annual inflow from the Syr and Amu rivers would have to be quadrupled from the recent average of 13 km3. The only means would be to curtail irrigation, which accounts for 92 percent of water withdrawals. Yet four of the five former Soviet republics in the Aral Sea basin (Kazakhstan is the exception) intend to expand irrigation, mainly to feed growing populations. Switching to less water- intensive crops, such as replacing cotton with winter wheat, could help, but the two primary irrigating nations, Uzbekistan and Turkmenistan, intend to keep cotton to earn foreign currency. The extensive irrigation canals could be greatly improved; many are simply cuts through sand, and they allow enormous quantities of water to seep away. Modernizing the entire system could save 12 km3 a year but would cost at least $16 billion. The basin states do not have the money or the political will. Kazakhstan has nonetheless tried to partially restore the northern Aral.

We expect salinities in the Small Aral to settle at three to 14 g/1, depending on location. At these levels many more indigenous species should return, although the saltwater kambala would disappear from most places. Further restoration is possible. For example, if irrigation improvements raised the average annual inflow from the Syr to 4.5 km3, which is entirely feasible, the lake’s level could stabilize at about 47 meters. This change would bring the shoreline to within eight kilometers of Aralsk, the former major port city, close enough to allow recovery of an earlier channel that connected the city to the receding waters. The channel would give large commercial fishing vessels access to the sea, and shipping could restart. Marshlands and fish populations would improve even more because of a further reduction in salinity. Outflow to the southern lakes could also increase, helping then

restoration. Such a plan would require a much longer and higher dike, as well as reconstruction of the gate facility, and it is not clear that Kazakhstan has the means or desire to pursue it. The country is, however, now discussing more modest proposals to bring water closer to Aralsk.

The Large Aral faces a difficult future; it continues to shrink rapidly. Only a long, narrow channel connects the shallow eastern basin and the deeper western basin, and this could close altogether. If countries along the Amu make no changes, we estimate that at current rates of groundwater in and evaporation out, an isolated eastern basin would stabilize at an area of 4,300 square kilometers (km2). But it would average only 2.5 meters deep. Salinity would exceed 100 g/1, possibly reaching 200 g/1; the only creatures that could live in it would be brine shrimp and bacteria. The western basin's fate depends on ground- water inflow, estimates for which are uncertain. Someone has noted numerous fresh- water springs on the western cliffs. The most reliable calculations indicate that the basin would settle at about 2,100 km2. The lake would still be relatively deep, reaching 37 meters in spots, but salinity would rise well above 100 g/1.

13- Conflicting climatic phenomena co-existing on the Mars

On Mars, signs of wetness keep pouring in: deeply carved river valleys, vast deltas and widespread remnants of evaporating seas have convinced many experts that liquid water may have covered large parts of the Red Planet for a billion years or more. But most efforts to explain how Martian climate ever permitted such clement conditions come up dry. Bitterly cold and parched today, Mars needed a potent greenhouse atmosphere to sustain its watery past. A thick layer of heat-trapping carbon dioxide from volcanoes probably shrouded the young planet, but climate models indicate time and again that C02 alone could not have kept the surface above freezing.

Now, inspired by the surprising discovery that sulfur minerals are pervasive in the Martian soil, scientists are beginning to suspect that C02 had a warm-up partner: sulfur dioxide (S02). Like C02, S02 is a common gas emitted when volcanoes erupt, a frequent occurrence on Mars when it was still young. A hundredth or even a thousandth of a percent S02 in Mars's early atmosphere could have provided the extra boost of greenhouse warming that the Red Planet needed to stay wet, explains geochemist Daniel p. Schrag of Harvard University.

That may not sound like much, but for many gases, even minuscule concentrations are hard to maintain. On our home planet, S02 provides no significant long-term warmth because it combines almost instantly with oxygen in the atmosphere to form sulfate, a type of salt. Early Mars would have been virtually free of atmospheric oxygen, though, so S02 would have stuck around much longer.

"When you take away oxygen, it's a profound change, and the atmosphere works really differently," Schrag remarks. According to Schrag and his colleagues, that difference also implies that S02 would have played a starring role in the Martian water cycle—thus resolving another climate conundrum, namely, a lack of certain rocks.

Schrag's team contends that on early Mars, much of the S02 would have combined with airborne water droplets and fallen as sulfurous acid rain, rather than transforming into a salt as on Earth. The resulting acidity would

have inhibited the formation of thick layers of limestone and other carbonate rocks. Researchers assumed Mars would be chock-full of carbonate rocks because their formation is such a fundamental consequence of the humid, C02-rich atmosphere. Over millions of years, this rock-forming process has sequestered enough of the carbon dioxide spewed from earthly volcanoes to limit the buildup of the gas in the atmosphere. stifling this C02-sequestration step on early Mars would have forced more of the gas to accumulate in the atmosphere—another way S02 could have boosted greenhouse warming, Schrag suggests.

Some scientists doubt that S02 was really up to these climatic tasks . Even in an oxygen-free atmosphere, S02 is still extremely fragile; the sun's ultraviolet radiation splits apart S02 molecules quite readily, points out James F. Kasting, an atmospheric chemist at Pennsylvania state University. In Easting's computer models of Earth's early climate, which is often compared with that of early Mars, this photochemical destruction capped S02 concentrations at one thousandth as much as Schrag and his colleagues describe. "There may be ways to make this idea work," Kasting says. "But it would take some detailed modeling to convince skeptics, including me, that it is actually feasible."

Schrag admits that the details are uncertain, but he cites estimates by other researchers who suggest that early Martian volcanoes could have spewed enough S02 to keep pace with the S02 destroyed photochemically. Previous findings also indicate that a thick C02 atmosphere would have effectively scattered the most destructive wavelengths of ultraviolet radiation—yet another example of an apparently mutually beneficial partnership between C02 and S02 on early Mars.

Kasting maintains that an S02 climate feedback could not have made early Mars as warm as Earth, but he does allow for the possibility that S02 concentrations may have remained high enough to keep the planet partly defrosted, with perhaps enough rainfall to form river valleys. Over that point, Schrag does not quibble. "Our hypothesis doesn't depend at all on whether there was a big ocean, a few lakes or just a few little puddles," he says. " Warm doesn't mean warm like the Amazon. It could mean warm like Iceland— just warm enough to create those river valleys . " with S02, it only takes a little. If sulfur dioxide warmed early Mars, as a new hypothesis suggests, minerals called sulfites would have formed in standing water at the surface. No sulfites have yet turned up, possibly because no one was

looking for them. The next-generation rover, the Mars Science Laboratory, is well equipped for the search. Scheduled to launch in 2009, the rover (shown here in an artist's conception) will be the first to carry an x-ray diffractometer, which can scan and identify the crystal structure of any mineral it encounters.

14- The Nagymaros Dam

When Janos Vargha, a biologist from the Hungarian Academy of Sciences, began a new career as a writer with a small monthly nature magazine called Buvar, it was 9 years after the story behind the fall of the Berlin Wall had started to unfold. During his early research, he went to a beauty spot on the river Danube outside Budapest known as the Danube Bend to interview local officials about plans to build a small park on the site of an ancient Hungarian capital.

One official mentioned that passing this tree-lined curve in the river, a popular tourism spot for Hungarians was monotonous. Also, it was to be submerged by a giant hydroelectric dam in secret by a much-feared state agency known simply as the Water Management.

Vargha investigated and learned that the Nagymaros dam (pronounced “nosh-marosh”) would cause pollution, destroy underground water reserves, dry out wetlands and wreck the unique ecosystem of central Europe’s longest river. Unfortunately, nobody objected. “Of course, I wrote an article. But there was a director of the Water Management on the magazine’s editorial board. The last time, he went to the printers and stopped the presses, the article was never published. I was frustrated and angry, but I was ultimately interested in why they cared to ban my article,” he remembers today.

He found that the Nagymaros dam was part of a joint project with neighbouring Czechoslovakia to produce hydroelectricity, irrigate farms and enhance navigation. They would build two dams and re-engineer the Danube for 200 kilometres where it created the border between them. “The Russians were working together, too. They wanted to take their big ships from the Black Sea right up the Danube to the border with Austria.”

Vargha was soon under vigorous investigation, and some of his articles got past the censors. He gathered supporters for some years, but he was one of only a few people who believed the dam should be stopped. He was hardly surprised when the Water Management refused to debate the project in public. After a public meeting, the bureaucrats had pulled out at the last minute. Vargha knew he had to take the next step. “We decided it wasn’t enough to talk and write, so we set up an organization, the Danube

Circle. We announced that we didn't agree with censorship. We would act as if we were living in a democracy." he says.

The Danube Circle was illegal and the secret publications it produced turned out to be samizdat leaflets. In an extraordinary act of defiance, it gathered 10,000 signatures for a petition objecting to the dam and made links with environmentalists in the west, inviting them to Budapest for a press conference.

The Hungarian government enforced a news blackout on the dam, but articles about the Danube Circle began to be published and appear in the western media. In 1985, the Circle and Vargha, a public spokesman, won the Right Livelihood award known as the alternative Nobel prize. Officials told Vargha he should not take the prize but he ignored them. The following year when Austrian environmentalists joined a protest in Budapest, they were met with tear gas and batons. Then the Politburo had Vargha taken from his new job as editor of the Hungarian version of *Scientific American.*

The dam became a focus for opposition to the hated regime. Communists tried to hold back the waters in the Danube and resist the will of the people. Vargha says, "Opposing the state directly was still hard." "Objecting to the dam was less of a hazard, but it was still considered a resistance to the state."

Under increasing pressure from the anti-dam movement, the Hungarian Communist Party was divided. Vargha says, "Reformists found that the dam was not very popular and economical. It would be cheaper to generate electricity by burning coal or nuclear power." "But hardliners were standing for Stalinist ideas of large dams which mean symbols of progress." Environmental issues seemed to be a weak point of east European communism in its final years. During the 1970s under the support of the Young Communist Leagues, a host of environmental groups had been founded. Party officials saw them as a harmless product of youthful idealism created by Boy Scouts and natural history societies.

Green idealism steadily became a focal point for political opposition. In Czechoslovakia, the human rights of Charter 77 took up environmentalism. The green-minded people of both Poland and Estonia participated in the Friends of the Earth International to protest against air pollution. Bulgarian environmentalists built a resistance group, called Ecoglasnost, which held

huge rallies in 1989. Big water engineering projects were potent symbols of the old Stalinism.

15- Frogwatch

Frogwatch, a remarkable success story started in Western Australia, is the brainchild of Dr. Ken Aplin. His work, as the curator of reptiles and frogs in the Western Australian Museum, invoked long field trips and he wondered if a community-based frog-rmonitoring network could help him keep track of frogs. Through such a network, ordinary untrained members of the community could learn about frog habitats, observe the numbers and kinds of frogs in their local area, and report this information to the museum.

'Launched in 1995, Frogwatch recently gained its 3221st member, and many people say that this is the best thing the museum has ever done. Each participant receives a ‘Frogwatch Kit’ - a regular newsletter, an audio tape of frog calls and identification sheets. Recently, Frogwatch membership increased dramatically when a mysterious parasitic fungus disease began attacking frogs nationwide. Although research is yet incomplete, scientists suspect the fungus originated overseas, perhaps in South America, where frogs have died in catastrophic numbers from a fungus disease genetically similar to the Australian organism.

Researchers in Western Australia needed to know how widespread the infection was in the state’s frog populations. So Aplin sent an ‘F-file’ (frog fungus facts) alert to Frogwatch members, requesting their help. He asked them to deliver him dead or dying frogs. More than 2,000 frogs have now been examined, half from the museum’s existing collection. Aplin once thought the fungus had arrived in Western Australia in only the past year or two, but tests now suggest it has been there since the late 1980s.

Frogwatch has proved to be Abe perfect link to the public and Aplin has become a total convert to community participation. He’s now aiming for a network of 15,000 Frogwatch members as the museum can’t afford to use professional resources to monitor frog populations. Much of the frog habitat is on private land, and without community support, monitoring the frogs would be impossible.

Not everyone is convinced by the ‘feelgood' popularity of Frogwatch. While Aplin believes even tiny backyard ponds can help to significantly improve frog numbers, Dr. Dale Roberts isn’t so sure, A senior zoology lecturer at the University of WA, Roberts agrees the program has: tapped into the

public’s enthusiasm for frogs, but he warns that strong public awareness does not amount to sound science.

He argues that getting the public to send in pages of observations is a good thing, but giving these reports credibility may not be valid scientifically. In addition, he’s not convinced that Frogwatch’s alarmist message about the danger of fungal infection is valid either. In Western Australia, for example, there was a long summer and very, late drenching rains, that year, following two equally dry years. So, he argues, there are other things that might have precipitated the deaths. He questions what could be done about it anyway. If it’s already widespread, it may not be worth the cost and effort of doing anything about it. Even if it’s causing high death rates, he says he can still find every frog species found over the past ten years in the south-west of Australia.

Roberts argues that Western Australia is different. Unlike most other states, species are still being discovered there; the disappearances of frog types in Queensland and New South Wales, are not occurring in Western Australia, although three south-west species are on the endangered list. Roberts believes that no amount of garden ponds in Perth will help those species, which live in isolated habitats targeted for development.

Aplin’s response is that increasing the number of frog-friendly habitats is important for the very reason that many Western Australian frog species are found in small, highly restricted locations. He argues that pesticide-free gardens and ponds can offer a greater chance of survival to animals battling habitat disturbance, environmental pollutants, climatic variations, and now fungal disease. Aplin’s opinion is that they should use the precautionary principle in cases where they don’t yet know enough about the situation. Usually diseases sort themselves out naturally and some frog fauna will co-evolve with the fungus. Given time some balance may be restored, but in the shorter term, they are seeing negative impacts.

The nationwide spread of the chytrid fungus is being mapped by Dr. Rick Speare, a specialist in amphibian disease at James Cook University. Speare also tests the accuracy of' Aplin’s fungus diagnoses and says Frogwatch is ‘an amazing and under-acknowledged system ... the best program in Australia for harnessing public interest in frog biology... There are a lot of eyes out there looking for dead or sick frogs, beyond the power of any biologist to collect.’

Aplin argues that they should never underestimate the importance of' having a community base, especially when governments want to cut research funds, ‘People can protest in ways that a handful of scientists hiding in a laboratory can’t do. For just about every environmental problem, community involvement is fundamental.’ Furthermore, Frogwatch is proving to be a social phenomenon as much as anything else. It seems ordinary people know that frogs are a measure of the environment’s health.

16- Kids and Sport

Two Italian psychologists, Vincenzo Marte and Giovanni Notarnicola, describe the traditional spontaneous practice of sport by children -climbing trees, riding a bicycle along quiet roads, racing their friends across the fields - as an activity of freedom, a special activity of discovery and learning. In the case of free sporting activity, the child's time is given up entirely to the activity, as can be seen in the endless games of football young children play, which may then be followed by bicycle races and/or a swim in the river, for example.

Today, however, children's discovery of sport has become very different. It is often parents who take their children, when they are very young, to the swimming pool or to the sports grounds or sports halls. Children's first experience of sport thus takes place as an organised activity, which they see as organisation of their free time. By organising sport for children, and often deciding for them, we unfortunately create an imbalance preventing them from managing their own play/sports time, thus denying them an opportunity of autonomy and independence as was possible in the past.

A first possible reason for the imbalance in the practice of sport by children is therefore linked to the urban society we live in today. We need not regret the past; it is rather a question of knowing how to recreate this freedom in our towns and in the country, where sport is increasingly based on organised leisure activities. Doing one sport is now the rule in clubs. Sports grounds are often on the outskirts of cities, and are overcrowded and invariably enclosed, while recreational areas such as parks or hard-packed surfaces, are very few and far between. How can we find the balance of a varied and spontaneous relationship to sport under such conditions?

Some interesting answers have already been suggested, which take into account the need to recreate this freedom. Marte and Notarnicola have shown that children who have experienced such freedom were considered by sports trainers to be more capable when they joined organised sport aged 12-13. Their study concluded that no formal training, no matter how early in life it took place, could replace these first experiences.

Measures which would reverse this imbalance include: increasing the number of sports facilities which encourage self-organisation by the children, and also setting up unstructured playing areas with little in the way

of equipment. Areas where street sport can be practised need to be established and sports clubs which offer multidisciplinary sports training should be supported. Children should be offered pre-school activity where they can be discover different sports.

For children, sport remains a special kind of discovery and learning, no matter how much adults limit and control the practice of early intensive training. Here is the second example of imbalance in children's sport. Today, sport is practised with early intensive training from the youngest possible age. Sometimes this is even before the age of six and is usually one specific sport within an organised framework. When adult-style competitions are introduced at an early age, the conditions which encourage a balanced development of children through sport are no longer respected.

Today, early intensive training is much more widely on offer. Many sports organisations claim that they are forced to do to this type of training because of what is called 'the golden age' to acquire the physical skills. It is considered unthinkable for a young skater or gymnast to miss this period, because if they did so, they would fall so far behind the best, that they could never hope to catch up. Faced with this demand for early ability, it is important that a safety net is put in place to maximise the benefits and minimise the disadvantages of such intensive training.

Why do very young children give up sport? The most common reason for leaving a sport is to change to another sport, which in itself is no bad thing. However, children may leave a sport because they believe that they have received too much criticism and too many negative assessments. We know that young children, up to the age of eleven or twelve, cannot assess their own level of competence. They believe that if they are making an effort, then this in itself is a sign of their competence. We also know that young children are particularly sensitive to criticism from adults or peers. Trainers must therefore pay particular attention to this and avoid excessive criticism. They should also avoid any strategies that discriminate against the child: for example in team sports, naming first choice players and reserves. It should be remembered that primary school children's main desire is to have fun and socialise. The desire to improve and become a good competitor will develop later. This brief example shows that knowledge of child development is indispensable for those who take care of children at this age. It is up to trainers, sports doctors and psychologists to implement

the measures necessary to limit this excessive early practice of sport by children.

A third source of imbalance which threatens children and sport is parental attitudes. The American psychologist, Rainer Martens, emphasises that, ‘too often children’s joy of sports is destroyed by adults who want glory through victory.’ Several studies have shown that parental pressure is high on the list of reasons why children leave sport. The presence of mothers and fathers can prevent children from considering sport as their own, where they can learn to master technical difficulties, manage interpersonal relations, and experience success and failure. As Martens highlights, ‘adults are solely to blame if joy and sadness become synonymous, to a child, with victory or defeat.’

If the children make the decisions, this ensures that they enjoy being a child in sport, and are relaxed with their development as human beings. We need only observe the activity in a school playground, where games are organised on an improvised playing field, to understand that children show genetic traces of the hunter instinct, which naturally leads them to physical activity. Sport is included as something they want, and which they identify both as a means of release and as a form of self-expression. By acting as a route to self-discovery, sport gives children both the opportunity to know their limits, and to acquire tools which will allow them to surpass them. Playing sport is a source of learning, progress and pleasure; an additional way of enriching life.

17- PLEASE HOLD THE LINE

Nearly all of us know what it's like to be put on 'musical hold'. Call almost any customer service number, and you can expect to hear at least a few bars of boring elevator music before an operator picks up. The question is: do you hang up or do you keep holding? That may depend on your gender and what type of music is playing, according to research reported by University of Cincinnati Associate Professor of Marketing, James Kellaris.

Kellaris, who has studied the effects of music on consumers for more than 12 years, teamed with Sigma Research Management Group to evaluate the effects of 'hold music' for a company that operates a customer service line.

The researchers tested four types of 'on-hold' music with 71 of the company's clients, 30 of them women. Light jazz, classical, rock and the company's current format of adult alternative (a mix of contemporary styles) were all tested. The sample included individual consumers, small business and large business segments. Participants were asked to imagine calling a customer assistance line and being placed on hold. They were then exposed to 'on-hold' music via headsets and asked to estimate how long it played. Their reactions and comments were also solicited and quantified by the researchers.

Service providers, of course don't want you to have to wait on hold, but if you do, they want it to be a pleasant experience for you. But Kellaris' conclusions may hold some distressing news for companies. No matter what music was played, the time spent 'on hold' was generally overestimated. The actual wait in the study was 6 minutes, but the average estimate was 7 minutes and 6 seconds.

He did find some good news for the client who hired him. The kind of music they're playing now, alternative, is probably their best choice. Two things made it a good choice. First, it did not produce significantly more positive or negative reactions in people. Second, males and females were less polarised in their reactions to this type of music.

Kellaris' other findings, however, make the state of musical hold a little less firm: time spent 'on hold' seemed slightly shorter when light jazz was played, but the effect of music format differed for men and women. Among

the males, the wait seemed shortest when classical music was played. Among the females, the wait seemed longest when classical music was played. This may be related to differences in attention levels and musical preferences.

In general, classical music evoked the most positive reactions among males; light jazz evoked the most positive reactions (and shortest waiting time estimates) among females. Rock was the least preferred across both gender groups and produced the longest waiting time estimates. ‘The rock music’s driving beat kind of aggravates people calling customer assistance with a problem,’ said Kellaris. ‘The more positive the reaction to the music, the shorter the waiting time seemed to be. So maybe time does tend to fly when you’re having fun, even if you’re on musical hold,’ Kellaris joked.

But unfortunately for companies operating on-hold lines, men and women have different ideas about what music is ‘fun’. ‘The possible solution,’ Kellaris joked, ‘might be for the recorded message to say: if you’re a male, please press one; if you’re a female, please press two. If you are in a bad mood, please hang up and try later.’

18- TEAM-BASED LEARNING

With the globalisation of information technology (IT) and worldwide access to the Internet, people from all areas of learning are finding themselves using some form of information technology in the workplace. The corporate world has seen a boom in the use of IT tools, but conversely, not enough people with IT skills that can enter the workplace and be productive with minimal on-the-job training.

A recent issue of the New York Times reports that many companies are looking for smart students who may have a budding interest in IT. Some companies, trying to encourage students to attend interviews, provide good salary packages and challenging work environments. For example, one American IT consulting company offers high salaries, annual bonuses, and immediate stock options to potential recruits. It also brings in 25 to 40 prospective applicants at a time for a two-day visit to the company. This time includes interviews, team exercises and social events. The idea behind the team exercises is that the applicants get to see that they will be working with other smart people doing really interesting things, rather than sitting alone writing code.

In the past 10 years, employers have seen marked benefits from collaborative projects in product development. Apart from the work environment, there is also a similar body of research indicating that small team-based instruction can lead to different kinds of desirable educational results. In order to prepare IT graduates to meet these workplace requirements, colleges and universities are also beginning to include team-based educational models.

One of the leaders in promoting team-based education is the American Intercontinental University (AIU), which has campuses worldwide. AIU offers programs in IT with a major portion of the curriculum based on team projects. AIU has a large body of international students and students from different educational backgrounds. This team-based learning gives the students a sense of social and technical support within the group, and allows students firsthand experience of both potential successes and of inherent problems encountered when working with others.

Team-oriented instruction has not been the common mode of delivery in traditional college settings. However, since most college graduates who

choose to go into an IT work environment will encounter some form of teamwork at work, it is to their advantage that they are educated using collaborative learning and that they are taught the tools needed to work with different people in achieving common goals or objectives.

In team-based learning, students spend a large part of their in-class time working in permanent and heterogeneous teams. Most teams are made up of individuals with different socio-cultural backgrounds and varying skill levels. Team activities concentrate on using rather than just learning concepts, whilst student grades are a combination of overall team performance and peer evaluation of individual team members.

In a team-based environment, the teacher takes on the role of a facilitator and manager of learning, instead of just providing information to passive students. The facilitator/teacher also guides the team in identifying their goals and establishing standards of team performance. Team exercises then help the students to improve their problem-solving skills by applying theory to simulated real-world situations. Working as a team allows students to adopt new roles and empowers them to control their own learning. Students in teams are taught to use each other as resources and accept the responsibility of managing tasks.

Team members must also study assigned material individually to ensure their preparation for classes. There are individual assessment tests to measure if students have not only read the assigned material, but also understand the concepts of the module, and can apply them to given problems. Additional team assessment tests present a problem for discussion and require consensus, helping students learn critical communication skills. This also enables them to deal with conflicts between members before they escalate to crises. Team presentations (written or verbal) allow the team to focus and build cohesion, with team members sharing the responsibility for presenting and persuading the audience to accept their viewpoint. Feedback on how the team is functioning with task management, team dynamics and overall work is given by the facilitator. Team exercises that are application-oriented help students experience the practical application of concepts and learn from other students' perspectives.

Team-based classrooms are especially beneficial in colleges with international students. Since this type of learning encourages people to

listen and communicate with others, share problems, resolve personal conflicts, and manage their time and resources, it is a great environment for students who are in a new social situation. Since social interaction plays an important role during teamwork, team learning has an added advantage for students who are not comfortable in traditional classroom settings. It allows students from different cultures to understand their differences and use them productively. This type of learning environment also allows students to express themselves freely in a team context, rather than feeling singled out as when answering questions in a traditional classroom.

This learning model was designed to better prepare students for today's global workplace. Students are encouraged to explore ideas together, to build communication skills and achieve superior results. It is likely that employers will increasingly seek out students with these skills as we move into the future.

19- ALBERT EINSTEIN

Albert Einstein is perhaps the best-known scientist of the 20th century. He received the Nobel Prize in Physics in 1921 and his theories of special and general relativity are of great importance to many branches of physics and astronomy. He is well known for his theories about light, matter, gravity, space and time. His most famous idea is that energy and mass are different forms of the same thing.

Einstein was born in Wurttemberg, Germany on 14th March 1879. His family was Jewish but he had not been very religious in his youth although he became very interested in Judaism in later life.

It is well documented that Einstein did not begin speaking until after the age of three. In fact, he found speaking so difficult that his family were worried that he would never start to speak. When Einstein was four years old, his father gave him a magnetic compass. It was this compass that inspired him to explore the world of science. He wanted to understand why the needle always pointed north whichever way he turned the compass. It looked as if the needle was moving itself. But the needle was inside a closed case, so no other force (such as the wind) could have been moving it. And this is how Einstein became interested in studying science and mathematics.

In fact, he was so clever that at the age of 12 he taught himself Euclidean geometry. At fifteen, he went to school in Munich which he found very boring. he finished secondary school in Aarau, Switzerland and entered the Swiss Federal Institute of Technology in Zurich from which he graduated in 1900. But Einstein did not like the teaching there either. He often missed classes and used the time to study physics on his own or to play the violin instead. However, he was able to pass his examinations by studying the notes of a classmate. His teachers did not have a good opinion of him and refused to recommend him for a university position. So, he got a job in a patent office in Switzerland. While he was working there, he wrote the papers that first made him famous as a great scientist.

Einstein had two severely disabled children with his first wife, Mileva. His daughter (whose name we do not know) was born about a year before their marriage in January 1902. She was looked after by her Serbian grandparents until she died at the age of two. It is generally believed that she died from scarlet fever but there are those who believe that she may

have suffered from a disorder known as Down Syndrome. But there is not enough evidence to know for sure. In fact, no one even knew that she had existed until Einstein's granddaughter found 54 love letters that Einstein and Mileva had written to each other between 1897 and 1903. She found these letters inside a shoe box in their attic in California. Einstein and Mileva's son, Eduard, was diagnosed with schizophrenia. He spent decades in hospitals and died in Zurich in 1965.

Just before the start of World War I, Einstein moved back to Germany and became director of a school there. But in 1933, following death threats from the Nazis, he moved to the United States, where he died on 18th April 1955.

20- DRINKING FILTERED WATER

The body is made up mainly of water. This means that the quality of water that we drink every day has an important effect on our health. Filtered water is healthier than tap water and some bottled water. This is because it is free of contaminants, that is, of substances that make it dirty or harmful. Substances that settle on the bottom of a glass of tap water and microorganisms that carry diseases (known as bacteria or germs) are examples of contaminants. Filtered water is also free of poisonous metals and chemicals that are common in tap water and even in some bottled water brands.

The authorities know that normal tap water is full of contaminants and they use chemicals, such as chlorine and bromine in order to disinfect it. But such chemicals are hardly safe. Indeed, their use in water is associated with many different conditions and they are particularly dangerous for children and pregnant women. For example, consuming bromine for a long time may result in low blood pressure, which may then bring about poisoning of the brain, heart, kidneys and liver. Filtered water is typically free of such water disinfectant chemicals.

Filtered water is also free of metals, such as mercury and lead. Mercury has ended up in our drinking water mainly because the dental mixtures used by dentists have not been disposed of safely for a long time. Scientists believe there is a connection between mercury in the water and many allergies and cancers as well as disorders, such as ADD, OCD, autism and depression.

Lead, on the other hand, typically finds its way to our drinking water due to pipe leaks. Of course, modern pipes are not made of lead but pipes in old houses usually are. Lead is a well-known carcinogen and is associated with pregnancy problems and birth defects. This is another reason why children and pregnant women must drink filtered water.

The benefits of water are well known. We all know, for example, that it helps to detoxify the body, So, the purer the water we drink, the easier it is for the body to rid itself of toxins. The result of drinking filtered water is that the body does not have to use as much of its energy on detoxification as it would when drinking unfiltered water. This means that drinking filtered water is good for our health in general. That is because the body can

perform all of its functions much more easily and this results in improved metabolism, better weight management, improved joint lubrication as well as efficient skin hydration.

There are many different ways to filter water and each type of filter targets different contaminants. For example, activated carbon water filters are very good at taking chlorine out. Ozone water filters, on the other hand, are particularly effective at removing germs.

For this reason, it is very important to know exactly what is in the water that we drink so that we can decide what type of water filter to use. A Consumer Confidence Report (CCR) should be useful for this purpose. This is a certificate that is issued by public water suppliers every year, listing the contaminants present in the water. If you know what these contaminants are, then it is easier to decide which type of water filter to get.

21- SPEECH DYSFLUENCY AND POPULAR FILLERS

A speech dysfluency is any of various breaks, irregularities or sound-filled pauses that we make when we are speaking, which are commonly known as fillers. These include words and sentences that are not finished, repeated phrases or syllables, instances of speakers correcting their own mistakes as they speak and "words" such as 'huh', 'uh', 'erm', 'urn', 'hmm', 'err', 'like', 'you know' and 'well'.

Fillers are parts of speech which are not generally recognised as meaningful and they include speech problems, such as stuttering (repeating the first consonant of some words). Fillers are normally avoided on television and films, but they occur quite regularly in everyday conversation, sometimes making up more than 20% of "words" in speech. But they can also be used as a pause for thought.

Research in linguistics has shown that fillers change across cultures and that even the different English speaking nations use different fillers. For example, Americans use pauses such as 'um' or 'em' whereas the British say 'uh' or 'eh'. Spanish speakers say 'ehhh' and in Latin America (where they also speak Spanish) but not Spain, 'este' is used (normally meaning 'this').

Recent linguistic research has suggested that the use of 'uh' and 'um' in English is connected to the speaker's mental and emotional state. For example, while pausing to say 'uh' or 'um' the brain may be planning the use of future words. According to the University of Pennsylvania linguist Mark Liberman, 'um' generally comes before a longer or more important pause than 'uh'. At least that's what he used to think.

Liberman has discovered that as Americans get older, they use 'uh' more than 'um' and that men use 'uh' more than women no matter their age. But the opposite is true of 'um'. The young say 'um' more often than the old. And women say 'um' more often than men at every age. This was an unexpected result because scientists used to think that fillers had to do more with the amount of time a speaker pauses for, rather than with who the speaker is.

Liberman mentioned his finding to fellow linguists in the Netherlands and this encouraged the group to look for a pattern outside American English. They studied British and Scottish English, German, Danish, Dutch and Norwegian and found that women and younger people said 'um' more than 'uh' in those languages as well.

Their conclusion is that it is simply a case of language change in progress and that women and younger people are leading the change. And there is nothing strange about this. Women and young people normally are the typical pioneers of most language change. What is strange, however, is that 'um' is replacing 'uh' across at least two continents and five Germanic languages. Now this really is a mystery.

The University of Edinburgh sociolinguist Josef Fruehwald may have an answer. In his view, 'um' and 'uh' are pretty much equivalent. The fact that young people and women prefer it is not significant. This often happens in language when there are two options. People start using one more often until the other is no longer an option. It’s just one of those things.

As to how such a trend might have gone from one language to another, there is a simple explanation, according to Fruehwald. English is probably influencing the other languages. We all know that in many countries languages are constantly borrowing words and expressions of English into their own language so why not borrow fillers, too? Of course, we don't know for a fact whether that's actually what's happening with 'um' but it is a likely story.

22- A gentle giant and a pint-sized bully

Though a giant - more horse than dog, some say - the Irish Wolfhound, towering over his canine brethren, makes a surprisingly good pet. Hard as it may be to imagine how a hound bred for wolf-hunting, with muscular limbs, a swift turn of pace, the eyesight of an eagle, the stature of a thoroughbred, primed for, and indeed employed in, battle many times for war-hungry Celtic lords of yore, could possibly cut the mustard as a domestic pet, trust me: looks can be deceiving. In fact, despite his size and reputation, the wolfhound is becoming an increasingly popular pet choice for many families up and down the country.

Why? Well, there is a number of very good reasons. Firstly, the wolfhound is of above-average intelligence, and, therefore, responds very well to obedience training (provided the training is done from an early age, otherwise the animal's strong prey drive may hinder development in this area). Secondly, he is very good-natured; despite the hound's reputation as a fierce, battle-hardened animal, he is, in fact, very calm and even-tempered. Thirdly, the Irish Wolfhound is a very social animal and does well with young children. He views himself as a member of the family and so will be fiercely protective of all his 'siblings' and will not intentionally let any of them get in harm's way, though his considerable frame and slight clumsiness can lead to collisions if the little members of the household don't watch where they are going.

Though the Irish Wolfhound makes an adequate guard dog, he is, surprisingly perhaps, not terribly strong in this department. The hound tends to be aloof with strangers rather than aggressive towards them, and he may not, at least initially, bark at intruders, therefore scoring low in the watchdog department as well by failing to sound the alarm or alert the other members of the household to danger in good time. If he is provoked, however, or if a member of his 'pack' is threatened, his primeval instincts kick in. When that happens, intruders'd better look out!

He is a very needy pet and a large enclosed backyard is a must-have for any prospective owner because though he is easily house-trained, it is simply not fair to keep a dog of his size cooped up inside all day. His appetite is huge and this is one of the practicalities to consider before buying a Wolfhound - can you afford him? His large appetite also means that regular exercise is essential in order for him to remain healthy and at a

reasonably good weight. Five-minute walks to the corner shop will not do; this animal needs proper exercise and should be taken out for between one and two hours each day. Another practicality, and also a factor that influences cost (the cost of clean-up), is his tendency to shed. Irish Wolfhounds shed a lot of fur and dog hair will likely be deposited all over the house in vast quantities. If all this is bearable and if you still want a cuddly, affectionate giant anyway, then go for it! The Irish Wolfhound will provide you with many years of loyalty and friendship.

The truth, though, is that not everyone has the space to accommodate such a beast. And, indeed, others would struggle to find the time to devote to this needy creature. The alternative, perhaps, is the comparably tiny little West Highland White Terrier. The Highland and the Wolfhound have one very important thing in common; they are both fantastic with kids. It is here, though, that the similarity ends. The Highland sheds virtually no hair at all, so you won't be cleaning up after him all the time. He also loves to make noise, making him the perfect watchdog and quick to alert you when anything suspicious occurs. His size limits his ability to respond meaningfully to any real threat discovered though. Compared to the Wolfhound, he is a little more of a challenge in the training department, and must be monitored carefully and shown his place in the 'pack', otherwise his aggressive streak may come out and take over.

In almost every way possible, the Highland and the Wolfhound are different characters. The Highland could never be described as placid, and, in fact, is extremely excitable and very energetic. This little fellow suffers from a size complex of sorts, too, which sees him determined to boss those around him and have his way, despite his modest profile. He is not that interested in 'cuddles' either, so don't let his size fool you into suggesting otherwise -this is no toy dog. And he is, in general, not the most affectionate of dogs, being far happier digging up your garden or barking at the neighbour's cat than lying in the arms of his owner. So, while the Wolfhound is a gentle giant, the West Highland is, well, a little terrier in every sense of the word.

But while their character may differ, their fondness for exercise does not. The Highland is an intelligent breed and needs stimulation; regular walks are essential. He also has a penchant for water and loves to go swimming. And while he is excellent with older kids, toddlers should not be left alone

around the Highland as their size, coupled with their noisiness and hyperactivity, may prompt an aggressive response from the dog.

Though both breeds have their strengths and weaknesses as pets, overall, either would make an excellent addition to the family. The West Highland will be content enough indoors, provided he gets regular exercise, but the Wolfhound must have an outdoor play area. And that is the one point I must emphasize; don’t buy a Wolfhound unless you have plenty of room.

23- The Scarlet Pimpernel of the Vatican

Born in Kiskeam in his mother's native North Cork, Hugh O'Flaherty was brought up in Killarney, where his father was the steward of a local golf club. He was the eldest of four children, and, from an early age, appeared to have a vocation for the priesthood. His fondness for the church was formed in part during his education, which began at Presentation Brothers' School in a local monastery in his home town. He later attended Waterford College, but the priesthood was always going to be his calling, so he applied to Mungret College in Limerick and was accepted into the seminary there. He was posted to Rome as a young seminarian in 1922, the year in which Mussolini came to power. While studying in Rome, he earned a degree in theology and was ordained in 1925 before going on to study there for a further two years, earning his doctorates in divinity, canon law and philosophy.

O'Flaherty, posted at various times over the next few years in Egypt, Haiti, San Domingo and Czechoslovakia, as well as Palestine, soon proved himself a very able diplomat. His golfing skills were also noted, and he developed a number of high-profile connections in Italy through the world of golf, often playing with the likes of ex-king Alfonso of Spain and Count Ciana, Mussolini's son-in-law. These people were no doubt impressed by the golfing talents of the man, which were, considering he had been playing the game since early childhood and was a natural, by then rather impressive to say the least. O'Flaherty would come to rely on his high profile, as well as his 'high' connections in the coming years as war broke out in Europe and Italy aligned itself with Hitler's Germany and its policy of discriminating against minority groups. His connections would give him the power and influence to make a difference to the lives of thousands of innocent people when the time came, whilst his high profile made the German and Italian authorities slow to move against him.

In the autumn of 1942, the Germans and Italians started to crack down on prominent figures they viewed as being hostile to their goals. As their policies became more and more extreme, many people started to become alarmed by fascist propaganda. The German and Italian governments were not interested in justice, they were aligned on an ideological level and started to execute their policy of ethnically cleansing Italy of the so-called 'unwanted': Jews, blacks, gypsies and so on. O'Flaherty, on the other hand, having socialised with many prominent Jews throughout his time in Italy,

did not adhere to the Nazi ideology, and it was then that he started to act, protecting innocent Jews and other victims of injustice, and keeping them away from the claws of the Italian and German police, whose orders were to ship them to concentration camps.

O'Flaherty used his old college and indeed his own official residence as hiding places for the people he was trying to protect. As the situation got more and more desperate, and the numbers of people threatened grew, he even turned to using monasteries and convents as hideouts, calling in favours from old friends in these places who, by agreeing to house the 'unwanted', were not just risking a reprimand from the fascists had they been caught but were endangering their own lives by being party to O'Flaherty's campaign. In the summer of 1943, O'Flaherty extended his efforts to include helping escaped British prisoners-of-war and shot-down allied airmen. Calling once again on his contacts, he developed a network of apartments in which to house them until their safe return to Britain could be arranged.

By the end of the war, over 6,500 Jews and American and British soldiers had O'Flaherty to thank for their escape from the Germans and a nearly certain death. His success in never being identified when on unauthorised rescue missions outside of Vatican City, and in smuggling Jews and allied airmen inside the city led to him being given the nickname the Scarlet Pimpernel of the Vatican, an acknowledgement of how much the master of disguise O'Flaherty had become. After the war, O'Flaherty continued to serve in Rome and received many accolades, including the US Medal of Freedom and the title Commander of the British Empire. The fledgling Jewish state of Israel also recognised O'Flaherty's contribution by proclaiming him Righteous among the Nations.

In 1960, O'Flaherty retired and went home to Ireland to a town called Cahirsheveen. There he lived for the remainder of his life until he died on the 30th October 1963. His death was mourned throughout the world and the prestigious New York Times carried a front-page tribute in his honour.

Margaret Mead once said: 'Never doubt that a small group of thoughtful, committed, citizens can change the world. Indeed, it is the only thing that ever has'. O'Flaherty and his loyal group of helpers within the Vatican and without are exactly the kind of people she was referring to. In life, he saved thousands of innocent Romans; in death, he is remembered as a man who

bravely stood up to extremism and who was not prepared to turn a blind eye to injustice.

24- ALL YOU NEED TO KNOW ABOUT SNOW

Types of Snowfall

Snow is typically the product of weather conditions in which an extratropical cyclone has formed. Extratropical cyclones bring extremely hazardous weather, such as high winds and heavy rain or snow, and are often referred to as windstorms in Europe. The band of precipitation associated with their warm front is often very extensive. When the warm front and cold front collide, snow can result on the poleward side of the precipitation band; that is, on the northern side in the Northern Hemisphere and on the southern side in the Southern Hemisphere.

Lake-effect snow is another kind of common snowfall. Although the name suggests a particular correspondence of this type of precipitation to lake features, in fact, all narrow bands of water may generate it. Lake-effect snow occurs when the water temperature is considerably higher than the air temperature of a cold front progressing over a large water mass. Warm moist air is then attracted upward at a relatively fast rate, condensing to form vertically oriented clouds. If the temperature difference between the body of water and the air above is significant, say, 13 degrees or more, this can result in heavy and prolonged snowfall.

Mountainous areas are also prone to experiencing heavy snowfall. Accumulations typically occur on the windward side of the mountain as precipitation is 'squeezed out' of the warm moist air as it is forced to ascend the slopes; the moisture condenses upon contact with the colder air found at higher altitudes and heavy snowfall can then occur if ground conditions are sufficiently cold.

How Snow Is Formed

Snow crystals, tiny supercooled cloud droplets, form at extremely low temperatures in the atmosphere. Temperatures lower than minus 35 degrees Celsius are required for this supercool moisture to freeze by itself. In warmer clouds, an aerosol particle such as clay or desert dust, or an ice nucleus is needed for the freezing to start.

Once a droplet of water has frozen, it starts to grow in the supersaturated environment of the cloud. Eventually, due to its size, the cloud will not be

able to contain the ice crystal anymore. At this point the ice crystal will fall to the ground and, if it is not melted by warmer air at lower altitudes, it will do so as snow. Although the ice crystals that land on the ground are actually transparent, hollow imperfections in them mean that light is scattered and they often appear white in colour owing to diffuse reflection of the whole spectrum of light.

The Snowflake

The shape of a snowflake is determined by the atmospheric conditions present at the time of its formation, specifically temperature and humidity. Between 0 and -3 degrees Celsius, thin flat crystals called planar crystals grow. From -3 to 8, the crystals form needles or prisms with pencil-like shapes. The shape then reverts back to plate-like until after 22 degrees Celsius when column-like structures (needles and prisms, etc.) begin to form again. At temperatures of 22 degrees and below, as well as the column-like structures, more complex growth patterns also form.

Snowfall in the British Isles

Snowfall occurs frequently in the U.K., but the quantities are typically small and it seldom persists for very long. In recent years, a trend towards milder, wetter winters has been developing, though the 2010/11, 2011/12 and 2012/13 winters seem to have bucked the trend and, indeed, represent the longest period of consecutive cold winters for more than 50 years. For its latitude, the British Isles should see far more prolonged cold weather in winter and regular snowfall. However, the Gulf Stream, a mild Atlantic Ocean current, keeps the climate several degrees warmer than regions of similar latitude in other parts of the world. As a consequence, despite the occasional incident of prolonged cold, Britain’s winters are typically not very severe.

Some parts of the isles see little, if any, snow from year to year. The most snow-prone are the Pennines, the Scottish Highlands, the Welsh Hills and the mountains of Northern Ireland. The Scottish Highlands boasts the isles’ highest peaks and also their only winter ski resorts. For years, unreliable snowfall has threatened to close these resorts, though, having had three consecutive bumper seasons, there is now less pressure on the Scottish ski industry, which, not so long ago, was threatened with going out of existence.

Long-term weather forecasts for the British Isles are notoriously hard to get right; however, so far, three months before the official start of the meteorological winter in December, forecasters are predicting another winter of record-breaking low temperatures. They point to sunspot and geothermal activity, and changes in the strength of the Gulf Stream as key indicators of the fact that a cold winter is in prospect. Were their predictions to be realised, then this would point to the isles undergoing a subtle climatic change and a return to more severe winters in general.

25- It’s Only a Cockroach

I turn on the light in my kitchen that night, and then I see it. I draw back, and my first instinct is to scream. I control myself with difficulty, but find myself shuddering, unable to deal with the creature before me. It’s only a cockroach, but its large size, long antennae, shiny appearance, and spiny legs, all present a particularly disgusting appearance. And this is not just to me, but to everyone it seems, even to the point of phobic responses.

This is certainly the over-riding reason I want these creatures totally eradicated from my apartment, but with their offensive odour, passive transportation of microbes, and trails of droppings, they also pose a distinct threat to domestic hygiene. Clearly, cohabitation is not possible. So, I do all I can to keep these pests away. Food is stored in sealed containers, garbage cans have tight lids, my kitchen is kept spotlessly clean, and my apartment swept and mopped nightly. I have also sealed up possible entry points, but still, these loathsome things find their way inside. I need a way to kill them.

The most precise cockroach killer is, typically, another insect. A specific species of wasp targets these creatures. With a quick accurate swoop, it bites the cockroach at the main nerve centre of its body, which results in a temporary paralysis. This is very necessary, as we all know just how fast cockroaches can run. The wasp has only a few minutes to prepare its next sting, in the exact area of the brain which controls the cockroaches’ instinct to escape. After the paralysis departs, the cockroach is subdued and docile, and doomed. The wasp bites off the antennae to further discourage flight, then drags its victim away.

Faced with such predation, cockroaches usually conceal themselves during the day, and with their ability to flatten their bodies, they can disappear into just about any tiny nook, crevice, and cranny. There, they wait patiently for darkness before emerging to search for food, and will usually run away when exposed to light. Given this, I am told that the slim and agile house centipede is probably the most effective cockroach predator, able to track down and root out the most carefully hidden prey. Unfortunately, I would say that centipedes are even more disgusting to have in one’s house, if that’s possible. I just can’t win this game.

Can anyone win? These insects are just about the hardiest, on the planet. Some can wait for up to three months before meals, some can survive on

the barest hint of nutrition (such as the glue on the back of postage stamps), and some can live without air for over half an hour. They do not, however, handle cold weather well, preferring the warm conditions and security found within buildings.

Hidden there, the female lays egg capsules containing around 40 eggs, and with the insect's relatively long lifespan (about a year), some 300 to 400 offspring can ultimately be produced. The result: once these insects have infested a building, they are very difficult to eradicate.

Cockroaches do, however, have some subtleties. They leave chemical messages in their droppings, as well as emit airborne pheromones to signal other cockroaches about sources of food and water, and alert them to their own presence. The latter is more important, for these insects are actually somewhat gregarious. Research has shown that cockroaches make group-based decisions, and tend to co-operate. One study placed a large number of cockroaches in a dish with three small shelters, and the insects divided themselves equally between two of them, leaving the third one empty. When these shelters were exchanged for two very large ones, all the cockroaches arranged themselves in just one. These creatures, it seems, prefer the company of others, and a rather fair al location of resources.

Should I therefore feel any admiration? It is hard - in fact, in Western culture, cockroaches are almost universally depicted as repulsive and dirty pests. In the insect's most famous literary appearance - Franz Kafka's 'The Metamorphosis' - a man, Gregor, is transformed overnight into a monstrous insect, probably a cockroach (although the story never quite makes that clear). Gregor's transformation results in very predictable responses from his family and friends, who can never accept him again. He eventually dies, outcast and lonely, despised and mistreated - a potent symbol of alienation and rejection. Yet in the Pixar animated feature 'Wall-E', a cockroach provides essential companionship to a lone robot living on a planet scorched by a nuclear holocaust.

Whatever the case, I am faced with a big problem: a large ugly cockroach crawling slowly across my sink, antennae waving as it explores around. If I try to grab it, it will dart away, and I doubt whether I'll be able to catch it before it disappears into the numerous cracks and crevices of my old apartment. So, I carefully remove my slipper, determined to squash the insect, but then

almost scream again as it lifts on its legs, raises membranous wings, and with a loud buzzing noise, flies away. Oh, just what I need they can fly, too.

26- Such a Fascinating Game

It is one of the world's most popular games, played by millions of people at home, in clubs, online, by correspondence, and in tournaments. It is chess, a humble arrangement where two players stare at a checkered board with 64 squares arranged in an eight-by-eight grid, eyeing their 16 pieces each as the first move is played. When the opponent's king is checkmated, the game is over, but between the beginning and the end, a wealth of elegant, complicated, and fascinating moves and combinations can unfold.

The origins of chess lie in Northwest India, around the 6th century. At that time there existed a game known as caturanga, which means 'four division', those divisions being of the military, represented by the infantry, cavalry, elephants, and chariotry. These pieces were aventually to become the pawn, knight, bishop, and rook, respectively, in the modern descendant of the game. Around 600 AD, caturanga spread to Persia, then, after the Muslim conquest of that region (beginning around that time), the game gained ground throughout the Islamic world, from where it eventually spread to Europe.

Around 1200 AD, Southern Europe began modifying the rules, and within 300 years the game had become recognisably the one we play today. The queen had long replaced the earlier vizier to become the most powerful piece, while the pawns were given the option of advancing two squares on the first move in order to accelerate play. These new rules quickly spread across Western Europe, creating the game now known as 'western chess' or 'international chess', to distinguish it from older or regional variants of the game.

As for the players themselves, one world think that the best of them are necessarily smart, with extremely high IQs; however, research has not been able to confirm this link. Some studies have shown that good chess players may have strong IQs, but there appears to be no direct correlation between this and chess ability. Paradoxically, the academically brilliant may even be less able at chess, and vice versa. Evidently, there are other factors involved, such as spacio-visual insight and subliminal memory, not necessarily picked up by conventional intelligence tests, readily noticeable, or even useful in real life.

But there are non-mental factors which clearly play a role. No one can doubt that raw talent is necessary, but even the best and brightest must systematically undergo at least 10 to 15 years of theoretical study and competitive practice before reaching world championship levels. The American chess genius, Bobby Fischer, was only 13 when he produced the 'Game of the Century', but he was not world champion until he was 29. The Russian chess player, Garry Kasparov, was the youngest world champion ever, at 22, but he began dedicated state-sponsored training from the age of ten onwards, complete with personal chess coaches.

All this shows the fixed place chess has in western culture, meaning also that this region has, historically, produced all the greatest players. However, interest in chess is now growing in the East, although there is one problem being the stiff competition it faces with local board games, such as Xiangqi and Go. These are more popular by a wide margin, but regarding China for example, with its huge population and state-sponsored training, it is fast becoming a major chess power. The reigning women's world chess champion is Chinese, and the country performs well in chess Olympiads. The future for the game in this country looks bright indeed.

Talking about the future inevitably leads to the subject of computer chess. Serious chess-playing machines began to emerge in the 1970s and 1980s, but their abilities were far below that of the top human players. Progress, although slow, was steady, and with increasing memory and faster processing, it was inevitable that one day a computer would be able to match humans. Yet this is merely by brutally going through all the possible moves, millions per second, deeper and deeper into the position. The final move-choices give the appearance of intuition and long-term strategy, when in actual fact they are simply based on an unthinking and directionless material count.

In 1989, the computer 'Deep Thought' scored some wins against top human players, although the world champion at that time, Garry Kasparov, easily defeated the machine in some arranged games. In 1996, however, IBM brought out the next generation computer, 'Deep Blue' , Pitting it in s match with this same player. Although it managed to score the first win against a reigning world champion, by losing three and drawing two of the remaining games, it lost the match. However, a return match the following year saw Kasparov facing an even better machine, 'Deeper Blue'. This time, the computer triumphed 3 1/2 - 2 1/2. And they are only getting better.

As impressive as these results seem, most people agree that it is similar to a forklift beating a weightlifter - somehow not a valid contest, and of little significance. Yes, computers can win games, but creativity and intelligence are still the province of human players. It is these factors, as well as the tense psychological struggle of minds and the personalities involved, together with the limitless artistry of the positions themselves, which will always make chess such a fascinating game

27- What's in Blood?

Blood is the most specialised fluid within living animals, playing an absolutely critical role. It symbolises life ('new blood'), health ('get your blood running'), personality ('good or bad blood'), and family ('your bloodline'). This red fluid itself is something which most people would rather not see, yet it contains such a complex soup of proteins, sugars, ions, hormones, gases, and basic cellular components that it is certainly worth considering in some detail.

By volume, half of blood is the liquid part, called plasma. The rest comprises specialised components, the main one being red blood cells (technically known as erythrocytes). These transport oxygen molecules throughout the body, and also give blood its colour (from the hemoglobin protein within, which turns red when combined with oxygen). Red blood cells, as with all cells in the human body, have a limited operating life. They are produced within the marrow of bones, principally the larger ones, and live for about four months before they fall inactive, to be then reabsorbed by the spleen and liver, with waste products absorbed into the urine.

This contrasts with the other main cells of human blood: the white blood cells, technically known as leukocytes. Similarly produced in the bone marrow, they are active only for three or four days, yet they are essential in defending the body against infections. White blood cells come in many different types, each designed to deal with a different sort of invader bacteria, virus, fungus, or parasite. When one of these enters the body, the white blood cells quickly determine its nature, then, after mustering sufficient numbers of a specific type (the period in which you are sick), they launch themselves into the fight, enveloping each individual invasive cell, and breaking it down (leading to recovery).

That leaves the last main component of blood: platelets. Their technical name is thrombocytes, and they are much smaller than red and white blood cells. Also circulating freely, they are responsible for clotting the blood, and this is necessary to heal both external and internal injuries. Again, they are produced in the bone marrow, and have the interesting ability to change shape. There are several diseases related to the breakdown in the regulation of their numbers. If too low, excessive bleeding can occur, yet if too high, internal clotting may result, causing potentially catastrophic blockages in parts of the body and medical ailments we know as strokes, heart attacks, and embolisms.

Blood's complexity presents particular difficulties in the advent of emergency transfusions. These are avoided whenever possible in order to lower the risk of reactions due to blood incompatibility. Unexpected antigens can trigger antibodies to attack blood components, with potentially lethal results. Thus, if transfusions are to take place, a thorough knowledge and classification of blood is essential, yet with 30 recognised blood-group systems, containing hundreds of antigens, this presents quite a challenge. The ABO system is the most important. On top of this is the Rhesus factor, which is not as simple as positive or negative (as most people think), but comprises scores of antigens. These can, however, be clustered together into groups which cause similar responses, creating some order.

Of course, the simplest system to avoid adverse transfusion reactions is for patients to receive their own blood - for example, in a series of blood donations in anticipation of an operation scheduled some months in advance. The second best system is to undertake cross-matching, which involves simply mixing samples of the patients' blood with the donors', then checking microscopically for clumping - a key sign of incompatibility. Both of these systems are obviously impractical in an emergency situation, which is why meticulous testing, documentation, and labeling of blood are necessary.

In a true emergency, a blood bank is needed, with an array of various types of blood on hand. Hence, blood donations must be a regular occurrence among a significant segment of the population. In the developed world, unpaid volunteers provide most of the blood for the community, whereas in less developed nations, families or friends are mostly involved. In the era of HIV and other insidious blood-borne diseases, potential donors are carefully screened and tested, and a period of about two months is recommended before successive whole blood donations.

Given the vital role which blood plays, it is strange to think that for almost 2000 years bloodletting was a widespread medical practice. It was based on the belief that blood carried 'humours', whose imbalances resulted in medical illnesses. Bleeding a patient was supposed to remove an undesirable excess of one of these. Furthermore, the fact that blood circulated around the body was unknown. It was instead assumed to be quickly created, and equally quickly exhausted of its value, after which it could stagnant unhealthily in the bodily extremities. Although the logic was there, it goes without saying that very few patients responded positively to such treatment.

28- MOUNT EVEREST AND HILLARY

Mount Everest, also known as Sagarmartha (Goddess of the Sky), is 8,348 metres tall, the highest mountain on earth above sea level. Formed about 60 million years ago and lying between Tibet and Nepal, Mount Everest appeals to climbers of every level, from novice to experienced climber. Each mountaineer pays a considerable amount of money to an experienced guide to help them achieve a successful climb. Everest was given its official English name in 1865 by the Royal Geographic Society upon recommendation of Andrew Waugh, the British Surveyor General of India at the time.

When Everest was officially announced as the world's highest mountain in 1852, it won interest from people all over the world, and the idea of climbing all (lie way to the summit was viewed as the ultimate feat. Nobody was able to climb Everest until 1920 when Tibet first opened its borders to outsiders, and between 1920 and 1952, seven major expeditions failed to reach the tip of Mount Everest, In fact, the mountain has a history of adversity and failure. With advances in climbing equipment in the last ten years or so, and more experienced guides, the fatality rates have dropped from 37% in 1990 to 4% in 2004. Nonetheless, the deadliest year in Mount Everest's history was 1996, when 19 people died near the summit.

In 1924, Mount Everest claimed the lives of its first two climbers. George Mallory and Andrew Irvine were two British climbers, attempting to reach the summit. The men were last seen heading for the top of the mountain until clouds surrounded Everest and they disappeared. Mallory's body was not seen again until 75 years on, in May of 1999, and Irvine's body is yet to be found. There is still no evidence as to whether these two men made it to the top or not, although disputes rages on, Those that believe the pair were the first; to climb Everest point to two specific points, firstly, Mallory's daughter has always said that Mallory carried a photograph of his wife on his person with the intention of leaving it on the summit when he reached it. This photo was not found on the body when it was discovered. Secondly, Mallory's snow' goggles were in his pocket when the body was found, indicating that he died at night. This implies that he and Irvine had made a push for the summit and were descending very late in the day. Given their known departure time and movements, had they not made the summit, it is unlikely that they would have still been out by nightfall.

The first time the actual peak of this monstrous mountain was reached was in 1953, in a combined effort by Sir Edmund Hillary and Tenzing Norgay. On the 29th of May that year, the duo conquered this epic mountain, standing at the highest point in the world for a brief 15 minutes. After a brief but fruitless search for evidence of the 1924 Mallory expedition, they buried a cross and some candy in the snow, taking a few photographs of the historic event. As Norgay had never operated a camera, there are no photographs of Hillary on top of the mountain, just shots of Norgay, and some additional photos looking down the mountain, ensuring evidence of their conquest and that the ascent was not faked.

When the news reached London on June 2nd, Sir Edmund Hillary was knighted in the Order of the British Empire and Norgay (a subject of the King of Nepal) was granted the George Medai by the UK, Sir Hillary turned to Antarctic exploration and led the New Zealand section of the Trans-Antarctic expedition from 1955 to 1958. In 1958, he took part in a mechanised expedition to the South Pole. Hillary continued to organise further mountain-climbing expeditions but, as the years passed, he became more and more concerned with the welfare of the Nepalese people. In the 1960s, he returned to Nepal, to aid in the development of the society, building clinics, hospitals and schools. After conquering Everest, Sir Edmund Hillary devoted most of his life to helping the Sherpa people of Nepal through the Himalayan Trust.

In January 2007, Sir Edmund Hillary went to Antarctica to commemorate the 50th anniversary of the founding of Scott Base. He flew to the station on 18 January 2007 with a delegation including the Prime Minister. On the 22nd of April 2007, while on a trip to Kathmandu, he was reported to have suffered a fall. There was no comment on the nature of his illness and lie did not immediately seek treatment. He was hospitalized after returning to New Zealand. Sadly, Sir Edmund Hillary died of a heart attack on the morning of January the 11th 2008. Hillary’s life was marked by wonderful achievements, his giving nature, grand discovery, and excitement. But he was a humble man who did not admit to being the first man to reach the summit of Everest until long after 1386, well after the death of his climbing companion Tenzing Norgay.

The latest record for climbing Mount Everest was set on the 30th of May in 2005 by Nepalese Mona Mulepati and PemDorje Sherpa, who were the first couple to get married on top of Mount Everest.

29- SLEEP

Like many things about your body, scientists and medical professionals still have a lot to learn about the process of sleep. One earlier misconception that has now been revised is that the body completely slows down during sleep; it is now dear that the body's major organs and regulatory systems continue to work actively – the lungs, heart and stomach for example. Another important part of the body also operates at night – the glands and lymph nodes, which strengthen the immune system. This is commonly why the body's natural immunity is weakened with insufficient sleep.

In some cases, certain systems actually become more active while we sleep. Hormones required for muscle development and growth, for instance, as well as the growth of new nerve cells. In the brain, activity of the pathways needed for learning and memory is increased.

Another common myth about sleep is that the body requires less sleep the older we get. Whilst It is true that babies need 16 hours compared to 9 hours and 8 hours respectively for teenagers and adults, this does not mean that older people need less sleep. However, what is true if that for a number of different factors, they often get less sleep or find their sleep less refreshing. This is because as people age, they spend less time in the deep, restful stages of sleep and are more easily awakened. Older people are also more likely to have medical conditions that affect their sleep, such as insomnia, sleep apnoea and heart problems.

Getting a good sleep is not just a matter of your head hitting the pillow at night and waking up in the morning. Your sleep goes in cycles throughout the night, moving back and forth between deep restorative sleep and more alert stages with dreaming. As the night progresses, you spend more time in a lighter dream sleep.

Sleep patterns can be broken down into two separate and distinct stages – REM and NREM sleep, REM (Rapid Eye Movement) sleep is when you dream. You usually have 3 to 5 periods of REM sleep each night, lasting from 5 minutes to over an hour, during which time your body's activities increase. Breathing becomes fast, shallow and uneven, with an increase in brain activity, heartbeat and blood pressure. Although your major muscles generally don't move, fingers and toes may twitch and body temperature changes and you may sweat or shiver.

Research has concluded that this sleep is most important for your brain. It is when it is most active, processing emotions and memories and relieving stress. The areas used for learning and developing more skills are activated. In fact, the brain waves measured during REM sleep are similar to those measured when awake.

NREM (Noil-Rapid Eye Movement) sleep is dreamless sleep. NREM sleep consists of four stages of deeper and deeper sleep. As you move through the stages, you become more relaxed, less aware of what is happening around you and more difficult to wake. Your body's activity will also decrease as you move through the NREM stages, acting in the opposite manner to REM sleep. Stage 1 of NREM sleep is when you are falling to sleep. This period generally lasts between 5 and 10 minutes, during which time you can be woken easily. During stage 2, you are in a light sleep- the in-between stage before your fall into a deep sleep. It lasts about 20 minutes. In stage 3, deep sleep begins, paving the way for stage 4, in which you are difficult to awake and unaware of anything around you. This is when sleep walking and talking can occur. This is the most important stage for your body. Your brain has slowed right down and is recovering. Blood flow is redirected from your brain to your large muscles allowing them to mend any damage from your day at work. People woken quickly from stage 4 sleep often feel a sense of disorientation, which is why it is helpful to use an alarm clock with an ascending ring.

About an hour and a half into your sleep cycle you will go from deep Stage 4 sleep back into light Stage 2 sleep, then into REM sleep, before the cycle begins again. About 75% of your sleep is NREM sleep. If you sleep for eight hours, about six of them will be NREM sleep. As the night progresses, you spend more time in dream sleep and lighter sleep.

When you constantly get less sleep (even 1 hour less) than you need each night, it is called sleep debt. You may pay for it in daytime drowsiness, trouble concentrating, moodiness, lower productivity and increased risk of falls and accidents. Although a daytime nap cannot replace a good night's sleep, it can help make up for some of the harm done as a result of sleep debt. But avoid taking a nap after 3 pm as late naps may stop you getting to sleep at night. And avoid napping for longer than 30 minutes as longer naps will make it harder to wake up and get back into the swing of things.

30- HAZARD MANAGEMENT

In many industrial or manufacturing workplaces, managing hazards is essential for a successful health and safety system. Hazard management is an ongoing process that goes through five different stages, with each step becoming a stage on tire hazard management plan.

The first step is to identify potential hazards, remembering that hazards are classed as anything that could potentially cause harm not only to people, but also to the organisation. To illustrate, an industrial accident can cause an injury to employees, but can also result in lost production, broken machinery and wasted resources for the company. In many cases, local and national government legislation has strict regulations concerning hazard identification, and in many industries, especially those perceived to be dangerous, severe penalties can be incurred by companies overlooking such hazard identification.

Having identified the potential hazards, the next step is to assess the hazard; that is, to consider to what extent they are significant. To a degree, this is a subjective aspect of risk management, as what may be seen by one person to be a significant issue can be seen by another to be an acceptable feature of a workplace. To allow for a degree of uniformity, in this stage, hazards are rated using risk assessment tables. These tables work by assigning a point value to three areas. The first is the exposure score, which assesses how often people are exposed to the hazard. If this is a continuous risk which employees face all the time, the score will be high; if the exposure is very rare, the points given will be substantially lower, The score is then multiplied by the likelihood of this hazard causing an injury, ranging from ‘Definite’ (it happens all the time) down to ‘Unlikely’ (it hasn’t happened yet). This is referred to as the chances rating. The sum of the first two scores is again multiplied by the effects score, which considers how serious any accident might be. This can be rated from 1 (requiring minor fist aid) right up to multiple deaths (classed as disaster). All 3 scores then give the final risk assessment result. Generally, a result in excess of 100 points requires caution, but a result of 200 hundred or more is classed as high priority. Certain jobs are, for the most part, permanently gamer scores of over 200 (fire-fighting, for example) and in many cases additional payments, informally known as ‘danger money’, are applied.

The third step on the hazard management plan is to control hazards that have been identified. There are 3 stages to hazard control. The first aim is to eliminate the hazard – that is, to get rid of it altogether. This can be achieved by removing debris or unnecessary obstacles from the workplace. Often, however, this is not possible, so the next step is to isolate the hazard, to store it out of the way. For example, a cleaning company cannot completely eliminate hazardous chemicals, but they can keep these chemicals locked away until required. Isolating hazards is an ongoing process which requires companies to have very dear and enforced guidelines regarding safe storage of potentially hazardous products.

If the hazards cannot be isolated, then the aim must be to minimise the risk. This is achieved through staff training in safe handling techniques and best practices, as well as the provision of personal protection equipment (PPE). PPE commonly includes items such as gloves, overalls and footwear with steel reinforced areas.

The fourth and fifth steps on a hazard management plan are connected – to record and review' the hazard. The recording is done in the hazard register, and this register is continually reviewed to ensure best practices are maintained. If a severe accident does occur in the workplace, it is the hazard register that investigators often first turn to, to see if the issue had previously been reported and if so what the company bad done about the hazard.

It is worth noting that since more rigorous application of hazard management systems, workplace accidents have experienced a significant decline in many industries previously identified as 'high risk'.