How about a bot for a boss?

- 31 January 2007
- From New Scientist Print Edition.

Robots have historically been accused of taking jobs away from humans, so a software bot that hands out tasks for people to carry out may make a refreshing change.

Suggestbot, developed by Dan Cosley at Cornell University in Ithaca, New York, and colleagues, could help online communities such as Wikipedia and Slashdot distribute editing tasks. Such organisations rely on members to add and edit content but, as work piles up, it can be hard even for dedicated users to pick out appropriate tasks.

Suggestbot links tasks with people's interests. It can comb through thousands of Wikipedia articles with a "needs work" tag and compare them to the list of previously edited articles on a user's profile, looking for similar articles. To test if this could increase productivity, Cosley studied the work of 91 Wikipedia editors, who had collectively requested 3094 tasks. He tested three versions of the Suggestbot algorithm - one compared titles of "needy" articles with those in the editor's profile, the second paired people with tasks popular with editors with a similar history, and the third looked for links between needy articles and those in an editor's profile.

Each of the algorithms was equally likely to be used to generate a task, as was a random task generator. Two weeks after the tasks were handed out, just 1 per cent of the randomly chosen articles had been edited, compared to 3.4 to 4.3 per cent of the articles selected by the intelligent task recommenders. Cosley believes combining the three strategies could increase this further.

From issue 2589 of New Scientist magazine, 31 January 2007, page 23

Natural oils gave young boys breasts

22:00 31 January 2007
NewScientist.com news service
Andy Coghlan

Three young boys grew breast tissue after exposure to lotions and shampoos containing lavender or tea tree oil, researchers say.

It is not uncommon for boys to develop breast tissue during puberty or just after, but the boys affected by the plant oils were aged four, seven and 10.

The natural oils may be “gender-bending” chemicals mimicking effects of the female hormone, oestrogen, the findings suggest. The boys were otherwise normal, and lost the breast tissue within months of discontinuing use of the products.

Researchers who identified the oils as the cause of the abnormalities in the three pre-pubertal boys have warned parents and doctors to beware of the effects of any toiletry products containing the oils.

“If consumers are concerned about exposure to lavender or tea tree oil, they should talk to their physicians,” says Derek Henley of the US National Institute of Health Sciences labs in Research Triangle Park, North Carolina, US. “Now that physicians are aware of the problem, they can document cases,” adds Henley, whose team identified the oils as the probable cause in three affected boys.

Oestrogen mimics

In follow-up lab tests on breast cells, they confirmed that the oils act both as oestrogen mimics, and as suppressors of masculinising hormone signals. “These are definitely the first substances to show a combination of oestrogen mimicry and anti-androgenic activity,” says Henley.

“This report raises an issue of concern, since lavender oil and tea tree oil are sold over-the-counter in their ‘pure’ form and are present in an increasing number of commercial products, including shampoos, hair gels, soaps and body lotions,” the researchers warn.

Henley says that there are “multitudes” of products on offer containing the oils. But despite finding the connection, he says that the scale of effects remain completely unknown.

“It’s not fair to speculate on what the effects might be in girls, older women or older men,” he says.

Because the boys were each exposed to the oils regularly for weeks, the researchers speculate that there might be a threshold “dose” for the effects to kick in. This, in turn, could depend on the concentration of the oil in the product, the duration of use, the frequency of use and genetic factors which make certain people, but not others, vulnerable to the effects.

Journal reference: New England Journal of Medicine (vol 365, p 479)

Vaccine zaps allergy in record time

03 February 2007
NewScientist.com news service
Aria Pearson

ALLERGY sufferers could bid farewell to their sneezes with a new generation of vaccines that take effect within weeks.

Existing vaccines for allergies involve three to five years of regular injections with increasing amounts of allergen - the substance that triggers an allergy. All the while the immune response slowly changes from a predominance of T-helper 2 (TH2) cells, immune cells responsible for triggering allergic reactions, to T-helper 1 (TH1) cells, which stimulate the production of protective antibodies.

Because nothing is directing allergens to the right place in immune cells, it takes a lot of allergen to generate a response.

Now researchers at the Swiss Institute of Allergy and Asthma Research (SIAF) in Davos Platz have developed "modular antigen translocating molecules" (MAT), which make vaccines more efficient by delivering the antigens - foreign substances that trigger an immune response - right to where they're needed within an immune cell.

The MAT vaccines trigger the same protective response as conventional vaccines but in a fraction of the time and with much less allergen, according to a study in human cells. "They lower the dose needed to induce a T-cell response by a factor of about 100," says Reto Crameri of SAIF, lead author of the study.

The molecules have three parts: a translocation unit, a targeting unit and an allergen. The translocation unit gets the allergen into antigen-presenting cells that are responsible for engineering the switch to TH1 cells. The targeting unit then chauffeurs the antigens to the part of the cell that packages them up for presentation to TH1 cells, ensuring more TH1 cells meet the antigen and respond to it.

Crameri's team has so far developed vaccines for dust mites, pollen, cat hair and bee venom and tested them on cells from susceptible humans. In each case the vaccines produced a stronger immune response than injecting the allergen by itself (*Allergy*, DOI: 10.1111/j.1398-9995.2006.01292.x). Crameri says his group is getting similar results with mice injected with these vaccines, and clinical trials on a MAT vaccine for cat allergy will begin later this year. The trial will involve three shots over a four-week period.

The approach is one of several new strategies for tackling allergies. Another vaccine, developed by Allergy Therapeutics of West Sussex, UK, entered phase III clinical trials last week. It stimulates a stronger response by tricking the immune system into thinking it is being attacked by a bacterium. "In the past few years we have really begun to understand the cell signalling mechanisms involved in the allergic response," says Katherine Gundling of the Allergy Immunology Clinic at the University of California, San Francisco. "Now we're asking, 'Can we find a way to take advantage of those mechanisms?'"

From issue 2589 of New Scientist magazine, 03 February 2007, page 12

When co-operation is the key to survival

03 February 2007
NewScientist.com news service
Bob Holmes

FORGET what you might have heard about "nature, red in tooth and claw". Mother Nature, bless her heart, may be much kinder and gentler than most people give her credit for.

That will come as a surprise to many ecologists, who for decades have tended to focus on the "selfish" ways organisms make life harder for one another, such as when one species preys on another or competes with it for space or food. In contrast, relatively few ecologists have studied the ways in which species - unconsciously, of course - make life easier for their neighbours. These positive interactions have generally been assumed to play relatively unimportant roles in ecosystems.

That assumption is wrong, some now claim. "People weren't really looking at the big picture of why a group of species is found together. Often it's because of the positive effect of some other species," says Andrew Altieri, a marine biologist at Northeastern University's Marine Science Center in Nahant, Massachusetts. These so-called "foundation" species can underpin an entire ecosystem by creating a suitable habitat for all the other species that live there. On the pebble beaches along the coast of Rhode Island, for example, hot summer sun and the waves battering the pebbles keep the beach almost devoid of life, except in a few areas which support dense stands of cordgrass, ribbed mussels and a few associated species.

To test whether the cordgrass and mussels act as foundation species, Altieri's team removed either cordgrass or mussels or both from experimental plots, then monitored what happened to the rest of the animals and algae. Mussels, barnacles and algae all survived in greater numbers when cordgrass was present, which indicates cordgrass's beneficial effect on these species. Similarly, mussels had a beneficial effect on snails and barnacles.

Further experiments showed that these foundation species benefit the others largely because they shade the surface, prevent the cobbles from rolling and create crevices for smaller organisms to live in (*The American Naturalist*, vol 169, p 195).

The study shows that this cordgrass community is indeed built on beneficial interactions, says Altieri. This is also likely to be true in many other harsh environments, he says, where survival would be difficult without a foundation species to provide shelter for the others. It may even be true, he suggests, in the most benign environments such as coral reefs or tropical savannahs.

What's more, adds Altieri, these beneficial interactions can be complex, as, for example, where snails depend on mussels which depend on cordgrass. "There are not just facilitators and species that get facilitated. There are facilitators of facilitators." Each link in the chain may be essential to the survival of the whole system.

As always there is more to discover, says Bruce Menge of Oregon State University in Corvallis. "Whether the overall structure of the system is dominated by positive versus negative forces, we just don't know yet," he says.

From issue 2589 of New Scientist magazine, 03 February 2007, page 13

Menstrual mood swings may have a use after all

22:00 29 January 2007
NewScientist.com news service
Rowan Hooper

The monthly mood swings experienced by many women may serve an evolutionary purpose, researchers say, by helping to get them pregnant.

Levels of sex hormones such as oestrogen and progesterone fluctuate throughout a woman's monthly menstrual cycle. During the follicular phase at the start of the cycle, the egg is maturing and the body releases oestrogen, while during the luteal phase, when a fertilised egg might implant, progesterone is secreted.

To see how these influence the brain, Jean-Claude Dreher and colleagues at the National Institute of Mental Health in Bethesda, Maryland, US, used functional magnetic resonance (fMRI) imaging to examine the changes in brain activity over the course of the month.

The team scanned the brains of 15 women at different stages of menstruation as they played a game with hypothetical prizes of money at the end. During the follicular phase, both the orbitofrontal cortex and the amygdala showed higher activity both when the women were anticipating a reward and when the reward was delivered. The orbitofrontal cortex is associated with decision making, reward and emotion processing, and the amygdala mediates emotional reactions.

This means the women were probably experiencing greater feelings of reward during the first half of their menstrual cycles than during the second half, although they were not specifically asked to report this. "Our work specifies the brain networks that are modulated by the menstrual cycle," says Dreher.

Pleasure booster

It is unwise to speculate whether women also get more pleasure from activities such as sex, shopping or eating chocolate during the first half of their menstrual cycle. So says Emily Stern at Cornell University's Weill Medical College, New York, US, whose own work has shown how women use different parts of the brain at different stages of their menstrual cycle. "However, certain behaviours that are known to involve reward systems, such as drug addiction, might be enhanced during the follicular phase," she says.

Indeed, previous experiments have shown that women report getting more pleasure from cocaine and amphetamine use during the follicular phase compared to the luteal phase, says Dreher. He believes his findings may therefore help treat women with drug abuse problems, or those with mood disorders.

Dreher also speculates that increased feelings of reward during the follicular phase – when a woman is ovulating and therefore most likely to get pregnant – may have an evolutionary benefit. "It is interesting to note that, from an evolutionary perspective, the increased availability, receptivity and desire that may occur during the ovulatory period has been thought to facilitate procreation," he says.

Journal reference: *Proceedings of the National Academy of Sciences* (DOI: 10.1073 / pnas. 0605569104)

Breathing life into artificial organs

01 February 2007
Celeste Biever
Magazine issue 2589

Jeff Borenstein holds up a piece of semi-transparent rubber, about half the size of a credit card. If all goes to plan this unassuming piece of rubber could become the building block for the first 3D artificial organs.

Stacks of these bendy, biodegradable flaps are fused together to form structures snaked through with a network of interconnecting channels. When pumped with a solution of cells, nutrients and oxygen, these channels spring into life, forming a system of blood vessels and tissue that might one day be the basis of an artificial heart, kidney or liver.

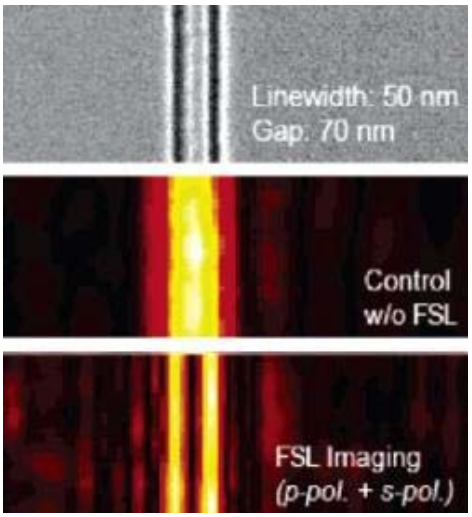
Borenstein, a micro-machinist at the Draper Laboratory in Cambridge, Massachusetts, is just one of a number of people who are attempting to build sophisticated artificial organs complete with their own network of blood vessels, or vasculature.

So far simple organs including skin and bladders have been built by seeding a tissue scaffold with cells that ...

'Superlens' has its reach extended

17:23 01 February 2007
NewScientist.com news service
Tom Simonite

A lens capable to resolving objects too small for of conventional optics has been dramatically improved by US researchers.



The new superlens can distinguish two nanowires just 70nm apart (bottom), which is not possible using a conventional lens microscope (middle). The top image was taken using a scanning electron microscope (Image: Berkeley University/ACS)

It can now transmit ultra high-resolution images over much longer distances. Previously, the sensor used to capture an image had to be placed within nanometres of the lens. The researchers involved say it has potential for imaging manmade or biological structures so-far seen only using electron microscopes.

The team from Berkeley University in the US say the advance should make it easier to build so-called "superlenses", which can image nanostructures never before resolved using visible light.

Conventional lenses can only see details roughly down to the size of half the wavelength of light. This limit is due to interference and diffraction that occurs as light bounces off an object.

A superlens gets around this limit by collecting light waves that only occur very close to an illuminated object. These "evanescent waves" contain information about at finer resolution but are hard to use because these waves decay rapidly. The nanometre-scale region in which they exist is known as the "near-field".

Evanescent light

The Berkeley team, led by Xiang Zhang, developed the first working superlens in 2005. They used a very thin layer of silver, placed in the near-field to collect and focus evanescent light waves.

However, the original superlens could only transmit near-field waves to a sensor positioned within its own near-field. Now Zhang and colleagues have developed a lens that coverts near-field waves into normal light waves, which do not decay over distance.

This means a light sensing device like a microscope could be placed further away from the superlens itself, although the lens would still need to be within it target's near-field.

"It represents a significant step towards a practical imaging application," Zhang told **new Scientist**.

The Berkeley team improved their silver-film superlens by adding 35-nanometre-wide corrugations to its surface. These diffract light waves from an object's near-field, turning them into normal light waves.

Wire pairs

To test the superlens, they used a UV laser to illuminate pairs of nanowires separated by small gaps. The superlens was placed 35 nm from the wires while a normal optical microscope was positioned further away.

The superlens was able to distinguish two wires positioned just 70 nm apart – a resolution nearly three times better than that of conventional optics. The team are currently using it to examine more complex nanoscale objects.

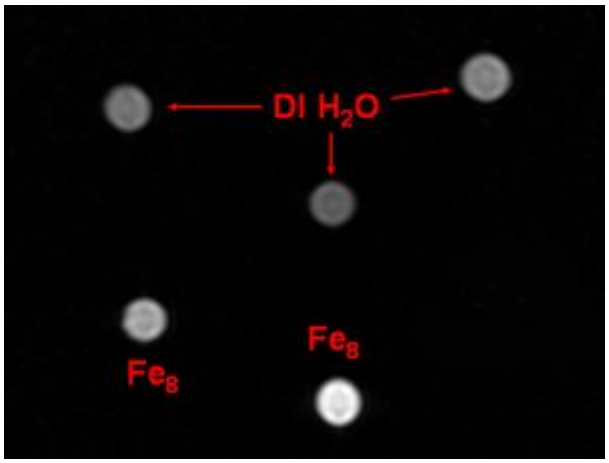
"This long-awaited paper is an essential step forward for the field of superlens research," photonic physicist Nikolay Zheludev, at Southampton University, UK, told **New Scientist**.

Being able to project the super-resolution image beyond the near-field could make the superlens much easier to use, Zheludev says. "But the lens still has to be positioned close to the object to be in its near-field," he points out.

A superlens that could focus on objects from beyond the near-field would be truly revolutionary, he adds. "There are suggestions that it's possible, but we don't know for sure."

Using Nano-magnets To Enhance Medical Imaging

Science Daily — Nanoscale magnets in the form of iron-containing molecules might be used to improve the contrast between healthy and diseased tissue in magnetic resonance imaging (MRI)--as long as the concentration of nanomagnets is carefully managed--according to a new report* by researchers at the National Institute of Standards and Technology (NIST) and collaborators. Molecular nanomagnets are a new class of MRI contrast agents that may offer significant advantages, such as versatility in design, over the compounds used today.



NIST studies show that molecular nanomagnets create concentration-dependent contrast in magnetic resonance imaging (MRI). This test image shows what happens when nanomagnets are used to alter the nuclear properties of hydrogen in water, increasing brightness (bright spots below left and center) compared to deionized water (above). (Credit: NIST)

Contrast agents are used to highlight different tissues in the body or to help distinguish between healthy and diseased tissue. NIST is working with two universities and a hospital to design, produce and test nanomolecules that might make MRI imaging more powerful and easier to perform. The new paper resolves a debate in the literature by showing that iron-containing magnets just two nanometers wide, dissolved in water, do provide reasonable contrast in non-clinical MRI images--as long as the nanomagnet concentration is below a certain threshold. (A nanometer is one billionth of a meter.) Previous studies by other research groups had reached conflicting conclusions on the utility of molecular nanomagnets for MRI, but without accounting for concentration. NIST scientists, making novel magnetic measurements, were able to monitor the molecules' decomposition and magnetic properties as the composition was varied.

The injectable dyes currently used as MRI contrast agents are of two types. Magnetic ions, which alter the nuclear properties of hydrogen in water, offer the advantage of consistent identical design but provide low contrast. The second category encompasses particles of thousands of atoms or crystals, which alter local magnetic fields; they provide contrast variation in a larger region but have irregular designs and magnetic properties that are difficult to control. By comparison, molecular nanomagnets can be designed to have consistent properties and high contrast. In addition, they might be modified to act as "smart" materials whose contrast could be turned on only when bonded to a target molecule or cell. Toxicity is not believed to be an issue, because iron is naturally found in the body and other studies have found that these materials are non-toxic at the concentrations used in MRI.

NIST works with Florida State University to make single-molecule magnets less than five nanometers (nm) in diameter, and works with the University of Colorado at Boulder to make nanocrystals in the 10-50 nm range. The agency is pioneering methods for manipulating and measuring the magnetic properties of these compounds and is developing instrumentation for understanding how contrast agents work and how to control contrast properties. Researchers correlate the measured properties to the observed MRI response under non-clinical conditions using imagers at The Children's Hospital in Denver. The information gained is fed back into recipes for making even better nanomagnets. The work described in the new paper was supported in part by the National Science Foundation.

* B. Cage, S. Russek, R. Shoemaker, A. Barker, C. Stoldt, V. Ramachandarin and N. Dalal. Efficacy of the single-molecule magnet Fe8 for magnetic resonance imaging contrast agent over a broad range of concentration. Polyhedron. In press, corrected proof available online.

Note: This story has been adapted from a news release issued by National Institute of Standards and Technology.

Six steps to a stress-free career

10:53 08 February 2007
Exclusive from New Scientist Print Edition. Subscribe and get 4 free issues.
Alison Motluk

New Scientist reveals how to keep your hair and ditch your high blood pressure without emigrating to a Pacific island.

*This feature is a part of the **New Scientist Careers Guide 2007**, available for free download.*

1. Create a good space

The angst begins before you even get to work. You can picture your workspace: narrow, cluttered and far too close to a loud-mouthed colleague. Then there's the overactive air con – your uncomfortable chair is right in its line of fire – and that's not to mention the lack of natural light and privacy.

Although it is oh-so-clear what your employer needs from you, few bosses have considered what kind of place you need from them. Work-related stress may be a hot topic these days, but little attention is paid to the importance of the physical working environment, says Jacqueline Vischer of the University of Montreal in Canada – how the wrong working space can stress you out, how the flow of people through an office or lab can affect communication and a sense of belonging, how the "feel" of a place influences the attitudes of the people who work there. We all sense these things, but few researchers have tried to quantify them, let alone address the situation.

Vischer has begun to measure the impact of the working environment on stress. She is looking not only at the physical side, such as chair height, lighting levels and air quality, she's investigating psychological comfort too.

Take an open-plan office. Vischer has studied how the partitions between desks can influence workplace stress, and she found something counter-intuitive: the higher they were, the more people complained about noise from their neighbours. Partitions, she found, should ideally be no more than 1.3 metres high – never so tall that you forget you're not alone. This trade-off between privacy and a need for interaction can be just as important in a lab.

Thankfully, some employers are beginning to realise this when designing workspaces for scientists (see "A place fit to work", below). The rest need to pull their socks up. It's not just the employee who pays the price; ultimately, a dysfunctional workplace will cost an employer too, says Vischer. "There's a hidden productivity cost of trying to make do with space that doesn't work."

OK, a freezing office or an ill-placed coffee machine will probably cause less stress than a psychotic boss or an inhumane workload, but even if the working environment only accounts for a small slice of your daily stress, she says, it is one of the easiest things to lobby your boss to fix.

A place fit to work

Scientists' workplaces are often particularly badly planned for their needs. "Good design understands use," says John Zeisel, an architect and sociologist. But as any scientist who works in an ancient lab in the bowels of their building will attest, many employers could do better.

Apart from the need for sunlight, people working in a lab have particular demands, Zeisel says. "The basic dynamic of a lab is this tension between the need to focus totally on your own, in private, and the need to communicate with your collaborators."

One place that has tackled this issue is University College London's functional imaging lab, with a design that has come in for a lot of praise from its users. So what did they do right?

• Everyone works together in what is effectively one large, shared study area. Physicists work side by side with neurologists, breaking down disciplinary boundaries; research fellows are seated randomly rather than in groups, fostering communication across projects; and all levels of seniority share the same room, which is great for mentoring, not to mention grapevines.

• Only the principal investigators (PIs) have private offices, but they are denied a coffee station on their floor, forcing them to mingle when they need caffeine or sustenance.

• The areas around the imaging machines are visible to all, a potent reminder to all that the people maintaining the equipment play just as vital a role in the experiments as the people conducting them.

• The rooms where imaging information is processed are small and secluded, allowing people to focus and avoid interruption while they carry out that work.

• Last but not least, says Richard Frackowiak, one of the PIs who worked closely with the architects on the design, the office is aesthetically pleasing, meaning people actually like being there.

2. Raise your status

Are you the secretary? Working in the post room? The technician in a lab full of big shots? Beware: having lower status can shorten your life.

This was the big lesson of the Whitehall I study in the 1970s, which looked at the health and working life of thousands of British civil servants and found that the lower a man's "grade" the more likely he was to die young, especially of coronary artery disease. Status has a similar effect on stress levels in the natural world.

Over the past 20 years, the second phase of the study has been tracking men and women in the civil service to tease out exactly how low status affects health. In one part of Whitehall II, which was published in the BMJ in 2006 (*BMJ*, vol 332, p 521), Michael Marmot and his team at University College London looked specifically at the long-term health effects of chronic work stress. Over

14 years, they asked over 10,000 people across 20 civil service grades about job stress, as well as collecting data on factors such as weight, diet and exercise.

They found that stressed employees were much more likely to develop what's known as "metabolic syndrome", a constellation of characteristics such as high blood pressure, high cholesterol and high fasting glucose levels, which together increase the likelihood of heart problems. It seems that prolonged exposure to work stress directly affects the autonomic nervous system, raising levels of the stress hormones cortisol and adrenalin. These findings, the researchers say, provide a plausible explanation for how psychosocial stress at work can cause heart disease.

Take control

What can you do about stress caused by low status and lack of control? Well obviously if you were in a position to choose, you'd have complete control over all aspects of your working life. So-called "stress" in the top ranks is different from the frank lack of control experienced by underlings. But in the meantime, here are some things you can try:

• *Negotiate your hours* - Work is less stressful when you have more control over your working hours and days off. Leena Ala-Mursula at the University of Oulu in Finland asked over 32,000 full-time public-sector employees in 10 towns about how much control they had over the length of their workday and breaks, how easy it was to take holidays or compassionate leave, and so on. She found that even for highly demanding jobs, more control made a difference, particularly for women.

• *Educate yourself* - People with PhDs live longer than people with master's degrees, who in turn live longer than people with only a bachelor's. A study of census data by Robert Erikson at Stockholm University in Sweden found that men aged 64 with a basic tertiary education had a greater rate of mortality than men with doctorates. In the years between 1991 and 1996, the less educated men had a 9.6 per cent chance of death, versus a 6 per cent risk among those with PhDs. Those with a master's had an 8.5 per cent risk of death.

• *Develop team rituals* - Working as a team is essential to taking control, says John Zeisel, a sociologist and architect. "Everyone on the team needs to initiate ideas," he says. "You can't wait for the boss to come around." He suggests ideas like employee-managed notice boards in prominent places so people always know what's going on, and a weekly communal lunch.

3. Be social

Hang out at the water cooler. Lunch with your supervisor. Booze it up together after work. Confide.

No matter how monotonous your job or how close you are to being laid off, social support from work colleagues will help lower your stress levels.

An earlier part of the Whitehall II study of civil servants' health at work showed that social support – including moral support from colleagues, encouragement from supervisors and clarity and consistency of information received from on high – had an effect on health (*Journal of Psychosomatic Research*, vol 43, p 73).

Employees with this support were less stressed and were less likely to have to take time off for psychiatric illness. Men with low social support, they found, were 31 per cent more likely to suffer from anxiety and depression, and women 43 per cent.

It's a primate thing

As with British civil servants, so with olive baboons in Kenya. Levels of the stress hormone cortisol in low-ranking male baboons are 66% higher than those in their superiors, according to research by Robert Sapolsky of Stanford University in California. But baboons with a social network, he found, do vastly better. "The single most important variable after you control for rank is social outlets," he says.

4. Don't be too social

Being sociable is great, but sociability to the point of not getting anything done is stressful. The day often follows this kind of pattern: you're intent on getting the data crunched, but in the cracks between replying to "urgent" emails, trading gossip with your neighbour and attending a string of impromptu meetings, there's just no time.

The average working person faces more interruptions each day than you might think. The scale of the problem definitely surprised Gloria Mark, a researcher at the University of California, Irvine, who set out to quantify how interruptions affect our working day. She followed 12 information workers around for three days and discovered that on average people squeeze in only three minutes of sustained work between interruptions. And you can't blame it all on colleagues, either: half of all interruptions are self-generated.

Part of the problem is new communication technology, and the expectation that anything – information, a person, a song – should be available the instant we want it. The good news is that many of the people who brought you the disruptive devices in the first place are developing ways to help you cope.

Microsoft, for instance, has a product that can evaluate all your incoming messages, and decide for you how urgent they are (*New Scientist*, 24 June 2006, p 46). It also checks on you to see whether you're too busy to be disturbed by those "urgent" emails.

As in any such arms race, however, this will ultimately lead to ever more sophisticated ways of getting in touch. And it won't stop you from gossiping…

5. Learn to switch off

Being able to forget about work after hours is good for you. So-called "psychological detachment" from the office has been associated with less fatigue, more positive mood and fewer days off work. If that's true, though, why do so many people keep a BlackBerry or a cellphone in their pocket?

"It's a modern addiction," says Edward Hallowell, a physician in Sudbury, Massachusetts. So addictive, in fact, that the BlackBerry has even acquired the nickname "crackberry". "If you take the substance away, you have an effect." He recounts a tale of one patient who had classic withdrawal symptoms when she changed jobs and had to give back her corporate BlackBerry. "She kept reaching for it and it wasn't there," he says.

Then there was the patient who asked if it was "normal" for her husband to put the BlackBerry on the pillow next to them when they made love.

Much of the problem starts at the top, Hallowell admits, with bosses who use "global competitiveness" as an excuse to keep their employees on the job 24/7. "They're overlooking the human brain," he says.

Burnout is no better for the company than it is for the individual. "Just as we learned how to drink responsibly, so we need to learn to use technology." Compulsive email checkers would do well to keep an egg-timer beside their home computer to call time, he says.

If that doesn't help, and work worries are keeping you awake at night, make a point of writing them all down before you go to sleep, says sleep specialist Colin Espie of the University of Glasgow. It helps you lay them aside for a few hours. Oh, and turn your BlackBerry off once in a while – just to prove to yourself you can do it.

6. Modern stress-busting

Even with the perfect office, great colleagues and a harmonious home life, the demands of work can cause stress. Some people try yoga, deep breathing or lunchtime walks. But what if you need something a little more powerful to alleviate your angst?

If deep breathing doesn't do it, you might be up for a trip to an oxygen bar. The claim is that breathing in a cocktail containing 30 per cent oxygen – as compared with the 21 per cent you get out in the open air – will relax you. A 10-minute fix costs about £5. Be warned, though, there's not much evidence yet to show that it relieves stress.

According to the US Food and Drug Administration, which has the power to regulate oxygen supplements as a prescription drug but doesn't see the need, no long-term well-controlled trials have ever been conducted.

Besides, if you're going to go sniffing things for relaxation, you might be better off putting your nose into a man's armpit – at least if you're female. George Preti at the Monell Chemical Senses Center in Philadelphia exposed 18 female volunteers to extracts from the armpit sweat of six men – and the volunteers claimed to feel "less tense" and "more relaxed" as they sniffed (Biology of Reproduction, vol 68, p 2107). No other aspect of mood was altered. Exactly how it might be working, says Preti, is unclear.

Maybe it's better to be sniffed than to sniff: we know animals help relieve stress. Sadly, though, most offices have policies against keeping a cuddly cat or bouncy puppy under your desk. Workers in Tokyo now have another option. An "animal therapy" centre in the back of a shop called Cats Livin' lets office workers nip out in the middle of the day to rub a feline tummy or two in a home-like setting.

Of course, you're never more relaxed than when you're asleep, and a nap may soon be as easy to buy as a haircut. In New York, for instance, MetroNaps will sell you 15 minutes of shut-eye for just $14. You can tuck yourself into a "pod" and doze until a gentle shaking and raising of the lights rouses you.