Sussex Scientists Use Toxic Gas To Give Robots New Powers

Neuroscientists here at Sussex have made a world-first discovery which could revolutionise the science of robotics. In the hope of creating robots which are completely autonomous, Dr Phil Husbands and Professor Michael O’Shea have transformed the workings of a robot's brain - by unleashing a toxic gas.

The gas - nitric oxide - is actually integral to the neurology of the human brain. Our bodies use nitric oxide to regulate blood flow, but it is also used in the brain to allow neurons to communicate with each other. The neurons produce the gas, and as the gas diffuses it enables these neurons to send messages to other neurons with which they are not physically or electrically connected. The discovery of nitric oxide as a message-carrying gas was, according to Michael O’Shea, "a completely new way of thinking about how the brain works." Adapting it for use in a robot's brain is even more radical.

Until now, attempts to replicate the human brain in robots have been hampered by the impossibility of creating something which, like our brains, has 100 billion neurons which connect with each other in a huge electronic mesh. Attempts to improve robot's brains have so far concentrated on trying to make as many 'neurons' as possible, which are as connected to each other as possible. The Sussex team - Michael, Phil Husbands and their students Tom Smith and Andy Philippides - have developed a brain which by-passes this elaborate process almost entirely, by simulating the action of the nitric oxide in our brains. As a result, Michael claims, "it transforms robots' brains from being pretty slow and stupid to being faster, more adaptable and clever."

"The gas allows messenger molecules to function over a much broader spectrum in the human brain," says Michael, "and, using a virtual gas, we can replicate this process in robots' brains." Using a mathematical construct, the existence of the gas is plotted into the computer which develops the robot. The robot is then allowed to 'evolve', with the virtual gas a central part of this 'evolutionary' process.

The Centre for Computational Neuroscience and Robotics, co-directed by Michael and Phil, was a pioneer in the concept of evolution as a way of developing robotic technology. As Michael points out, the process derives its inspiration from natural biology - "we incorporate biological reality into artificial systems and computers."

Robots which have 'evolved' haven't actually mated with other robots - a task has been set, and a computer programme run which takes the representative of each generation which seems most capable of the task and puts them forward into the next generation, where the most capable individual will again be put forward into the next generation and so on. At the moment, most tasks require an evolutionary cycle of around 6,000 generations before a robot is capable of the set task.

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Painting Restoration All in a 'Day's Work'

Falmer House sees the return of the newly restored, newly resplendent Day's Work, Day's Rest, an Ivon Hitchens painting belonging to the University and painted in 1960. The painting, which was dismantled for restoration last summer, had been flaking paint and was damaged by drawing pins which had been stuck into it to hold notices up. Depicting a woodcutter relaxing with his family and felling trees, it was restored to its former glory by Painting Conservator Philip Young. According to Simon Lane, who has compiled a database of all the University's art work, "most people are impressed and pleased with the restoration."
Dear Bulletin

I write following recent letters about the two-way traffic experiment and the proposed move of Brighton and Hove Albion to Falmer. With regard to the traffic experiment, all the staff in my office agree that it is a good idea. The majority of us either go straight over towards Woodingdean or down to the A27 towards Brighton. At least if there is a queue we can turn towards Lewes and queue for a maximum of a couple of minutes to get off. We now have the option. Well done for your initiative here. My only other comment is what about staggered finishing times for university staff, say between 4 and 6 pm?

In respect of the proposed Albion move I must declare my interest as an Albion supporter of long standing. As matches are played on Saturdays at 3 pm or in the evenings, probably at 7.45 pm, I cannot see how they can have any detrimental effect on traffic to or from campus. The A27 and A23 both provide excellent road access and Falmer railway station is very close to hand. The advantages to supporters travelling to matches are therefore enormous. There have already been large developments nearby, at the University of Brighton and the Health and Racquet Club. In respect of ‘problems with footballs clubs and hooliganism,’ I really think this is living in the past. Go along to an Albion game and see the number of women and children attending.

Come on, let’s get behind this idea as a way of putting the local football, and possibly cricket, teams back on the map!

Neil Cramp, Manager - Midland Bank (Campus Branch)

Dear Bulletin

It was good to see the Vice-Chancellor (11 Dec), like the AUT, recognising the problem of high teaching loads in Arts. However he is wrong to claim that ‘it’s for academic units to make the changes that are needed.’ As chair of a large unit, I must point out that we do not yet have the freedom to make the changes which count.

To cut teaching loads it is still necessary for the Arts Finance Committee to cut the Gordian knot of the FTE system, abandon FTE norms for units, and let units allocate their resources as they think fit within their budgets, as we were promised in the discussions on Arts reform. Only when this is done will the Vice-Chancellor truly be able to say that the responsibility lies at unit level.

Martin Shaw, Chair - International Relations and Politics

Dear Bulletin

I am writing with regard to the Vice-Chancellor’s “campaign against the use of the term ‘Sussex House’ except strictly as the name of a building” (V-C’s Voice 11.12.98). Now, as he says, I’m sure it is often the case (his “invariably” is pitching it a bit high) that unpopular decisions are the responsibility of committees consisting of academic colleagues. But the membership of such committees, the parameters within which they operate, the input into them of academics who have become part of the administrative machinery (eg. the unelected Pro-V-Cs), the relation of their decision-making powers to those of Schools, how decisions are put into effect - such things do not seem particularly transparent in other parts of the University.

Changes “from above” to exam regulations that are sought neither by students, nor Schools, nor Subject Groups seem a particular cause of grousesing about “Sussex House” nowadays. Instead of campaigning for geographical accuracy, a new V-C could help all of us, and himself, by pondering why the metaphorical “Sussex House” has in recent years become an inextricable part of our conceptual system.

Robin Milner-Gulland
Professor of Russian and East European Studies

Recycling

- Waste paper recycling bins are located at strategic locations around the campus. These are for recycling quality white paper. These bins are not for recycling envelopes, fax paper or cardboard. Your assistance with this is appreciated.

Prinny writes.....

I note an upcoming Royal Wedding between the Boy Prince and a Jill Dando look-a-like: a royal dukedom may be conferred as a wedding gift and I think it should be Sussex. The last Duke of Sussex was my youngest brother and he died in 1843 so it’s time to revive the title. Perhaps he might become the new University visitor?

An avid reader of the Daily Mail has pointed out a story in which MI5 had to move a group of secret agents because they had accidently released their address to a market research firm. The fascinating point was that the agents were all graduates of Sussex and living together in a shared house. One conjures up a fascinating imagery of life in a shared house of spies: cyanide pills in the kitchen cupboards with a sticky note attached reading “Hands off! They are mine! Simon!”: furious arguments in the morning over the reconnaissance photos left to dry in the bathroom overnight; arguments over the telephone bill (“Well, someone’s been ‘phoning the Russian Embassy and it wasn’t me!”); videos taken in secret of trade union meetings with Match of the Day taped over the last hour; and secret files piled up in or corner of the sitting room with unwashed plates and a half empty can of lager on top.

I was delighted to see that the traffic management scheme is to continue indefinitely but when are we going to get rid of that ugly orange plastic netting along the Science road? It makes one want to throw oneself in front of the traffic simply to escape it.

The Vice-Chancellor has asked us, in the collective sense, to avoid referring to the management of the University as ‘Sussex House’. Some colleagues are bereft, feeling that they’ve been asked to give up their favourite vituperative phrase. So I feel I must intervene: a bottle of bubbly to the best phrase for encapsulating the senior management ‘team’ and the Administration. Phrases utilising swear words will be immediately disqualified. It is my duty to ensure that we have a handy, and pithy, phrase for use in blaming someone else for failure or incompetence. Entries by 29 January to Prinny c/o Bulletin, Information Office, Sussex House, tel: (67)8888 or email Bulletin@sussex.ac.uk.
All in a Day’s Work

For all those sceptics who think University is about putting your feet up and watching TV all day, the Audio Visual Collection at the library is there to demonstrate that a student’s work is never done - especially when it comes to ogling the box. Janice Parlett and her team toil all day to provide students with educational material to occupy their viewing time. Now there’s no excuse for watching Neighbours! (Unless it’s on your reading list...)

In the AV Section we have about 3,000 videos and about 11,000 cassettes. The cassettes are mainly lectures which have been taped on campus, and people might borrow them if they are ill or if, as seems to happen increasingly, they have a timetable clash. The videos can be absolutely anything - we’ve got everything from episodes of Star Trek to Shakespeare. We have a few LPs too - some of them are probably quite rare - but new students have probably never heard of half of them, because the most recent is from 1969!

Even though we have all sorts of different films, people don’t use us as a lending library. Of course it is hard to tell, but a lot of people don’t realise what a wide range of things we have, so they don’t even think to come to us for films. Most people have something on their reading list, and they just come and get that. But if they do take things out for pleasure, it’s still educational isn’t it? They’re learning something from it...

The most popular things to get taken out are cassettes of lectures which people have missed or want to revise. Lectures are only taped if they are requested, but the AV team usually choose the films we record ourselves. It is difficult to know what films people will want though - the latest thing in our collection is a copy of The Simpsons, and we couldn’t have predicted that people might need to watch that! We’ve got lots of popular films which have been requested by tutors, things like Terminator and Robocop. We’re waiting for ER to be requested so we’ve got a good excuse to watch it! Having said that, we don’t watch many of the videos, but we do tape them ourselves from the TV, so that is why we can usually remember what we have in stock.

My average day is never average. I always set about doing something and then lots of things crop up and I end up getting completely distracted. But we usually start off by checking that what we have recorded the night before has worked out OK. The videos then have to be labelled and processed. We go through reading lists to see if there’s anything we haven’t got, and if there is we order it in. We are with an organisation who tape every single thing on TV, so if we miss something that someone then requests, we can order it from them.

The AV Section has doubled in capacity recently, and our new office is so much better. It is a bit further off the beaten track now, but the students don’t seem to be having much of a problem finding us. Even though we have been around for a while, people have started to use us much more now, and over the last five years we have expanded a lot. Even in courses you wouldn’t think of, like Geography, lecturers put films on their reading lists. Even though, in the long term, we might not need an AV collection because everything will be on the Internet, for the next few years our popularity is set to rise and rise.

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"By incorporating gases into the programme, you can solve an equivalent task in ten times fewer, and sometimes 100 times fewer generations," Michael says.

The brains of the new robots developed at the CCNR also have a much simpler internal system, because the gas cuts down the need for simulated neurons and the complex connections between them. This means that the process of their evolution, and indeed everything that determines how and why they work, becomes much more open to analysis. According to Michael, "The exciting opportunity is that we could then solve tasks using gasnets that would be impossible with conventional neural networks."

At the moment, robots are only capable of relatively simple tasks. A robot which can construct a car on a production line would not be able to vacuum a child’s bedroom, because such a task requires a level of intelligence neuroscientists have come nowhere near to developing. As Michael points out, "To clean a child’s bedroom, a robot would have to be so intelligent, it would virtually be as intelligent as a human being, and then it would probably tell you to do it!" However, with the introduction of gasnets, "we’re actually producing a robot which demonstrates quite sophisticated behaviour, as well as being almost autonomous."

The CCNR robot may not be able to vacuum a child’s bedroom - yet. But, as Michael points out, "Intelligence really springs from interaction with an unpredictable and unforgiving world," and robots using gasnets may be able to perform tasks in the near future which do require a measure of this intelligence. Tasks like clearing minefields, or helping with space missions, all cause problems for humans which would not affect robots in the same way. C3PO may become the new symbol of humanitarian aid.

Academic Office launches new Web Site

The Academic Office has recently launched its Web site. This includes detailed information on University policies and procedures (including Academic Audit procedures), Graduate Studies Committee, Arts and Social Studies Syllabus Sub-Committee and Science and Engineering Sub-Committee matters including, inter alia, the timetable and minutes of meetings, timetable for curriculum changes, the postgraduate syllabus and undergraduate and postgraduate examination handbooks for candidates. Information on the University’s franchised and validated partner institutions is also available. According to Alan Soutter, of the Academic Office, "the intention is for the Academic Office’s web pages to include as much helpful information as possible. The site is continually developing and, in the near future, colleagues will be able to download the forms for curriculum changes." The Academic Office Homepage URL is http://www.susx.ac.uk/Units/academic/

Personnel Director Appointed

The University has appointed Helen Scott as its new Personnel Director with effect from 1 April 1999, on the retirement of the Personnel Officer Adrian McAllister.

Helen Scott is currently the Deputy Personnel Officer and has worked for the University for over two years. Prior to working at Sussex, she was Senior Personnel Officer at the University of Oxford and has also worked in the NHS and the private sector.
VC's Voice

The Sussex European Institute continues to notch up remarkable successes. From the beginning, it has been committed to a view of Europe that encompassed the whole continent - it has never been an institute of EC or EU studies. That vision is now being rewarded. The Institute has done extremely well in student recruitment in recent years. The MA programme is one of the largest in the University, and funding for studentships has been obtained from a number of sources. This year’s student numbers have grown further, and much of the increase has come from Central and Eastern Europe; there are now 21 MA students and 11 doctoral students from that part of the continent.

Last year, in partnership with the Civil Service College, SEI delivered a course in Poland on negotiating with the European institutions. This year, a new Diploma, funded by the Foreign Office and designed for training young professionals from Central and Eastern European countries in the ways of the EU, has recruited 21 students. These developments show that it is possible for a top-rate academic institute to offer courses and qualifications that meet the needs of professionals in post without compromising academic standards.

In the same way, the Institute has combined a strong record of research funding from conventional academic sources like ESRC with a substantial amount of contract research for the European Commission and others. Again, involvement with practitioners can enrich rather than threaten academic research.

Ten years ago, Sussex had a reputation in Contemporary European Studies and a reputation in Europe (not the same thing!), but was not doing enough to exploit its reputation. That has now changed. The success of the SEI is due to the efforts of many people, but the role of the founding director, Helen Wallace, has been central to what has been achieved. The whole University has gained from Helen’s work in raising our profile throughout Europe.

There are a number of changes in personnel in SEI. First to mention is the appointment of Dr Adrian Treacher as lecturer in Contemporary European Studies. Formerly at the University of Birmingham, his main interests are in the EU as an international actor and European security issues. Two further appointments in SEI bring rich experience of the ‘real world’. The European Educational Research Trust is funding ‘SEI Practitioner Fellowships’ and Dr Alan Mayhew is a Visiting Senior Fellow within that programme. Alan formerly held senior positions in the European Commission, and he is currently an adviser to the Polish Government in its negotiations for accession to the EU. He is the author of Recreating Europe (Cambridge University Press, 1998), a masterly insider’s account of the EU’s relations with Central and Eastern Europe since the revolutions of 1989-90.

Helen Wallace is now spending a proportion of her time managing a major programme for ESRC and Jim Rollo, previously Chief Economic Adviser in the Foreign and Commonwealth Office, has been appointed co-Director of SEI and Professor of European Economic Integration. Like Alan, Jim has written on relations between the EU and Central and Eastern Europe as well as other international economic issues.

Members of the University should know that Jim Rollo has been a good friend of mine for more years than either of us care to remember. I therefore took absolutely no part in his appointment, but after the fact I hope that I am permitted to welcome the new appointments most enthusiastically, as promising still more from SEI.

£1 Million Sports Makeover Due for Completion

The £1 million revamp of on-campus sports facilities will reach its climax with the opening of the new Fitness Room in the Falmer Sports Complex.

Anyone who has made the resolution to ‘get fit’ for the New Year will be pleased to hear that the gym, expected to open on 1 February, will feature a wide range of new comforts and facilities. Making use of the lucrative lottery grant awarded to the Sports Service, the new two-storey Fitness Room will have air conditioning, a state-of-the-art sound system and new cardiovascular equipment including three treadmills.

The Sports Complex itself has benefited from a makeover - the two internal single changing rooms have been expanded to two changing rooms for indoor and four for outdoor sports, both with the latest facilities. In addition, a specially designed disabled changing room has been included. The three remaining squash courts have also been upgraded to include heating. There will also be, for the first time, a reception area so that people can book facilities over the phone (tel: ext 7125) as well as having a point of contact when they visit the Complex.

There will be eight new members of staff to see through the improvements, including fitness instructors, who will be able to tailor special programmes for gym-users, and will be on-hand to answer any questions or deal with any problems. As Simon Tunley, manager of the Falmer Sports Complex, points out, "up until now, this service has been provided on an ad-hoc basis, when staff were available to help, so this should be a great improvement.”

Simon is also keen to emphasise the community role played by the University Sports Service, with eight local sports clubs making use of the new or refurbished, and around 300 gym-users expected from the local community. As he points out, “when the University closes, we stay open,” which means the facilities are much more widely available to local people.

Other improvements in the service will result from the changes, including a greater number of dance and exercise classes in the old fitness room, which will be transformed into a dance studio. As Simon points out, “People may feel scrutinised when they do dance classes in the sports halls - the area is a bit too open.” The studio space can also be used for martial arts, an interest which is rapidly expanding among students.

Gym-users may be unhappy with the prohibitive distance of the Sports Complex from the rest of campus, but Simon has an answer for them - "If the Complex is ever going to be integrated into campus, people have to make the effort to use it. Sure, it is a walk, but it is no further than 10 minutes maximum from anywhere on campus. If you’re going up to the gym, it can be seen as a quick warm up anyway... So then you arrive having done your warm up... and on the way down it’s all down hill! In fact people might appreciate the chance to get away from the stress of the campus and come out into the countryside a little bit; there is also quality food available.”

One improvement gym users might be especially eager to see is the introduction of the new sound system and satellite TV...perhaps now there will be something other than George Michael to listen to when you’re sweating away on that exercise bike!

Look out for the flyer coming to you soon!
Close-Up on Research

Introducing a new series in which we will give you the lowdown on different areas of research in the University. This week, Dr Nadje Al-Ali, Research Officer in AFRAS, discusses her work on woman activists in Egypt...

They are in a difficult position because those on the political right advocate policies which oppress women, and those on the political left are wary of 'Western connections'. They believe there are more pressing problems which need to be addressed, like poverty and imperialism. However, the argument that justice (and injustice) are not determined by 'Eastern' or 'Western' values, but is universal, can be found among some political actors in contemporary Egypt. This has been helped especially through international conferences, which have allowed contact with other feminists in non-Western countries like Pakistan or other parts of Africa and Asia.

I would like to emphasise that it is not Islam itself which has resulted in women's oppression in countries such as Afghanistan. Islam can't be understood without looking at local cultures, traditions, and, more significantly, male interpretations of religion. In Egypt, for example, 10% of women are Christian, and they are oppressed in the same way as their Muslim sisters. Fundamentalist political movements are using and abusing the religion for political gain. Over the last few years, an increasing number of women have challenged male authorities and started to interpret religious texts themselves. It is these women who have shown us that Islam doesn't necessarily have to contradict feminist agendas, but can support it. Zeinab Radwan, a professor at Cairo University, has argued that before Islam, baby girls were often killed because of their gender. Islam was the first religion to end female infanticide. Polygamy has also reduced in Egypt with the rise of Islam. I don't want to enter into a theological discussion about Islam and the role of women here, suffice to say that women are increasingly appropriating religion to obtain their goals.

My research challenges the stereotype of Muslim women as veiled, passive and submissive. Certainly, the women activists I have worked with are not the very, very small section of the population. However, their actions influence other women who are struggling in their daily lives. In some ways these women justify what they do because they do it for the majority of women who come from a less privileged background than themselves. Of course it is dangerous to make assumptions for other women - for some women, for example, wearing the veil may be something which liberates them by enabling them to work and move around freely. But we must avoid being too relativist, a multicultural approach can sometimes ignore fundamental infringements of human rights. For example, a recent study in Egypt revealed that more than 90% of women in Egypt have suffered female genital mutilation.

Although the women's movement in the West was concerned from the very beginning with sexual freedom, women activists in Egypt would usually shy away from that association. For women who have to deal with literacy, poverty and other basic concerns, sexual freedom isn't high on the agenda. Even issues like reproductive health and domestic violence have only just come into the public forum. Women in Egypt may be struggling on many fronts - but the Western stereotype of Muslim women who accept oppression without question is being steadfastly challenged.

There is much more to it than the Western image of submissive Muslim women who accept oppression without question.
Educational Equality Unit Ushers in The Learning Age

When Mary Stuart, lecturer in CCE, asked a Mousecomb resident why she hadn’t thought of coming up to the University, she was told - “You might as well ask me to go to the moon. I can see it from where I live, but it’s like another planet.”

It is precisely this attitude which the Educational Equality Unit at the CCE is aiming to stamp out. The Unit, set up in 1995, aims to recruit students from local areas who would not normally consider the University as ‘their’ place. Last month the nationally recognised Unit held a conference in a bid to raise awareness within the University and demonstrate to colleagues the successes they have had in the last three years. The conference also highlighted a series of questions which will need to be debated if the University is to follow through on the widening participation agenda in the future.

The Government’s 1998 green paper on education ‘The Learning Age’, set out the need to include blue collar workers, unemployed people, the disabled, single parents and refugees in the processes of higher education. The Unit was established with the specific aim of targeting these groups, and in the understanding that traditional recruitment strategies involving Access courses were not successful in achieving this.

Excimer Laser Micro-machining facility for the School of Engineering

The Industrial Informatics and Manufacturing Systems (iims) Research Centre in the School of Engineering, led by Professor Chris Chatwin, has just been awarded £621K from the HEPCE Joint Research Equipment Initiative (JREI) and Industry. This award is for the purchase of the state-of-the-art Exitech Series S-8000 excimer laser micro-machining system. In collaboration with industry this facility will be utilised for machining of micro-components produced under parallel streams of multi-disciplinary research at the Universities of Sussex and Essex in electronics, mechatronics, photonics, optics and biotechnology. Using such techniques as mask projection ablation, workpiece step and repeat, mask indexing, synchronised mask scanning, mask dragging and half-tone mask - the excimer laser machining system will provide almost unlimited flexibility in the manufacture of complex 3D micro-components. Features may be machined to micron tolerances, with minimal thermal damage in the vicinity of the machining site. Research programmes utilising this equipment will deliver, to UK based industry, a new manufacturing technology that will facilitate micro-engineering for micro-component fabrication for: compact consumer products, micro-sensors, micro-actuators, micro-robot grippers, micro-robots, micro-drives, micro-connectors, micro-optical components, micro-metrology equipment, micro-medical implants and prostheses etc. In collaboration with local industry and in the context of market pressures for electronic circuits to be: lower in cost, smaller in size, lower weight, lower power and to provide greater functionality; this facility will provide a highly flexible research facility for fine, variable geometry, hole drilling in flexible circuits and multi-layer printed circuit boards and permit the investigation of laser vapour deposition of conductive materials onto the walls of micro and buried vias. Via multiple workstations the system will be used in parallel to conduct optical materials research for photonic systems using pulsed laser treatments, and to investigate the utility of the excimer for the manufacture of gene-chip arrays and as a clean processing technology. In the last two years the iims Research Centre has attracted funding in excess of £3.3million for industrially related research projects.

Science and Technology Media Fellowships 1999

Opportunities for scientists and engineers to work in the media.

“To enter into a different profession and assume it as your own, even for a brief period of time, is a rare opportunity” Media Fellow with The Guardian.

During a 4 - 8 week summer placement working with a newspaper/magazine, radio, or television, the media fellowships offer professional scientists and engineers, of any discipline, first hand experience of how the media works. In previous years placements have ranged from national papers eg. The Guardian, to television, radio and magazines eg. Tomorrow’s World, BBC Radio Science Unit, New Scientist. Fellowes will take a full role in the news-making process leaving them better equipped to communicate science to a variety of audiences. Deadline for applications is 31 March 1999.

For further information or an application form contact: The British Association, 23 Saville Row, London, W1X 2NB. Tel: 0171 973 3069/3070. Email: Meenal.gupta@britassoc.org.uk

Late Night Bus

Please note that the University of Sussex has, for some time, sponsored a Late Night Bus service which also includes a security presence for your personal safety. It has come to light that during this academic year, the service has not been supported as it has in the past. Investigations reveal that this may be due to the fact that our ticket prices are £1.25 (This is 25 p more than a competing service.) In order to ensure the competitiveness of the service the price per journey on the Late Night Bus will be reduced to £1 per ticket.
Cars and salt threaten Asian crops

Vehicle pollution and soil salinity together pose a serious threat to major crops on the Indian sub-continent, according to Karen Welfare of BIOILS. The number of motor vehicles is increasing rapidly and, in the hot and sunny climate, pollutants produced by the epidemic of vehicles in urban areas react to produce ozone. Air movement and the nature of the chemical reactions ensure that this has widespread effects on the surrounding countryside, where levels of ozone are often higher than in the areas which produce the original pollution. Evidence is accumulating that ozone, in concentrations now being found in the countryside, can have serious effects on major crops, such as chickpeas, rice and wheat. Under experimental conditions, yields are reduced substantially. Chickpeas are particularly susceptible and are a major and important part of the diet of both man and beast, providing protein, oil and carbohydrate. Rice and wheat can also be seriously affected, particularly in areas near large conurbations.

Soil salinity, which is made worse by poor drainage and the effects of irrigation, is another major factor limiting crop yields in the region. Karen and colleagues in the Plant Stress Unit have found that soil salinity increases the adverse effects of ozone but that genetic variants of chickpea differ in their ability to cope. The differences seem to be due to the plant's ability to produce antioxidants which serve as a defence mechanism. The researchers are working to identify the genes and mechanisms involved, information which could be a vital aid for plant breeders.

With no prospect of a halt to the increase in pollution by traffic, we may have to use genetic engineering to combat the adverse effects of automobile engineering.

1999 Teaching Awards Scheme

The University of Sussex Alumni Society makes up to three awards annually as one way of promoting excellence in teaching and learning at the University. The Awards are open to all those teaching or providing academic support for University courses, and for MPhil and DPhil supervision. Applicants for an award may be nominated by members of staff and/or students and alumni of the University, or be self-nominated. The 1999 scheme commences this term, with an initial deadline for nominations of Friday 19 February 1999 (end of Week 7).

The 1998 Awards were given at last summer’s Graduation Ceremony, to Tony Binns (Geography in AFRA S), Dorothy Sheridan (Mass-Observation Archive in the Library), and Nicola Woods (Linguistics in COGS). Profiles of the Award winners are included in the winter 1998/99 issue of Learning Matters.

The Panel for the 1999 Teaching Awards scheme is chaired by Alasdair Smith, the Vice-Chancellor, and is made up of Alun Anderson (Editor, New Scientist and Member of Council), Libby Lines (Alumni Society), Tony Binns (AFRAS and Member of Senate), and Hannah Darvill (Education Officer, USSU).

Nomination forms and notes for guidance are available from the Teaching and Learning Development Unit, Arts D421, Tel: 01273 678543, or Email: W.D.Locke@sussex.ac.uk

Information is also available at: http://www.sussex.ac.uk/Units/TLDU/tawards.html

It is with great regret that we have to announce the death of the following members of staff:

John Fletcher, a Night Porter in the Kings Road residences, aged 47, died suddenly on Wednesday 6 January. John had been with the University since November 1996.

Ron Shaughnessy, who had been with the University since 1992, died on Sunday 10 January. Ron was a technician in the CPES Teaching Laboratories.

Research Funding Opportunities

This is a selection of Research Opportunities. More details of these and other opportunities are available from the Research Grants and Contracts Office. Contact Debbie, ext 3812 or email: D.Foy-Everett@sussex.ac.uk For an extensive listing of funding opportunities see REFUND on the Research Web site: http://www.sussex.ac.uk/Units/research or USIS Home Page, under Research.

The Leverhulme Trust has announced that up to 20 Special Research Fellowships will be available across all subject areas in 1999. The fellowships are tenable for 24 months starting between the 1999/2000 academic year and 1 May 2000. For eligibility see RGCO. Deadline: 15 March

UKCOSA, The Council for International Education announced the availability of small research grants to support research in the field of international education at post-secondary level in the UK. Total value of each award is £6,000. Deadline: 31 March

The EPSRC invites applications under the 5th and final call in its scholastic modelling in science and technology programme. Its aim is to encourage collaborative and interdisciplinary research between statisticians, scientists, engineers & industry. Deadline 1 March

The Department for the Environment, Transport and the Regions invites applications for its research programme on land use, mineral, land instability and waste planning. For research areas see RGCO. No Deadline

The Lloyd's Tercentenary Foundation intends to award a small number of Research Fellowships tenable from October 1999 in the following categories: engineering; medicine & health care; environmental studies; and science & technology. Applications are sought from candidates intending to pursue research at a UK institution, it is not open to those holding academic posts. Deadline 26 March

The MRC and NERC are inviting joint bids for research proposals from environmental and medical scientists that focus on the relationship between human health and environmental variables. No Deadline

The EPSRC Information Technology & Computer Science Programme invites applications for research proposals for a new programme in Critical Systems. Projects should tackle real system level problems in the critical systems domain. Total projected grant commitment up to £2million. Deadline: 21 May

The EPSRC invites calls for proposals under the title Multimedia & Networking Applications Programme. Areas of research: network and mobility issues for multi-media; systems integration; and open distributed processing (see RGCO for a full list). Deadline: 26 March
**Noticeboard**

**Lectures, Seminars, Colloquia**

**Monday 18 January**

1.00pm **Experimental Psychology Seminar**: Zoltan Dienes. Can people implicitly learn the structures of serialist music? BLR (EP 3.9).


4.30pm **Neuroscience Seminar**: Keith Kendrick (Cambridge), Nitric Oxide and memory. BLR.

5.00pm **Women’s Studies Research-in-Progress Seminar**: Lucy Noakes (Portsmouth), Gender and National Identity in the Gulf War. D610.

**Tuesday 19 January**

5.00pm **Social Anthropology Graduate/Faculty Seminar**: Anthony Richmond (York University, Toronto), Multiculturalism and the Millennium. C219.

**Wednesday 20 January**

5.00pm **Sussex Centre for Optical and Atomic Physics**: Tom Kibble (Imperial College), Testing cosmological defect formation in the laboratory. Pevensey 1A7. Tea will be served on the Bridge from 4.30pm.

**Thursday 21 January**

11.30am **Economics Seminar**: TBA. D310.

4.00pm **Geography Research Seminar**: John Morfett (Brighton), Single transport on the Sussex coast. D340.

4.00pm **CPES Colloquium**: Sir Harry Kroto, Chemistry between the stars. Chichester Lecture Theatre.

4.00pm **Experimental Psychology Colloquium**: Sue Healey (Newcastle), Learning in action: foraging in hummingbirds. BLR (EP 3.9).

5.00pm **History Work-in-Progress Seminar**: Eileen Yeo, Motherhood in Diaspora: Jewish and Irish mothers in Britain and America, c1840-1940. A155.

5.00pm **French Seminar**: Jeremy Lane, Here is an unclarity. A71.

5.00pm **Sussex Development Lecture**: Hubert Schmitz, Industrialisation from Below? A1. 6.00pm **The Meeting House Lecture**: Rik Child, (Brighton and Hove Green Party) The Ethics of Sustainability. The Meeting House Quiet Room.

**Friday 22 January**

2.00pm **SPRU Seminar**: Esther Myrjam-Sent (University of Notre Dame, IN, USA) The Economics of Science: Survey and Suggestions. EDB Lecture Theatre (Rm 121).

**Miscellaneous**

**Bridge Club**: Inaugural meeting - Monday 18 January 5 - 8.50 pm. D520.

Badminton Club - Meets Thursdays 8pm-10pm in Sports Centre. Open to staff and research students. Female players particularly sought. Contact Carol Jerwood (Secretary) info@sdbe.demon.co.uk or 507866 (evenings) or just come along.

French Poetry Reading Club: Feeling and playing with words. Sessions run by Thamy Ayouch every Tuesday from 5.00 pm to 6.30 pm. D640. Max. 20 (regular) participants.


**CDU Info**

RACAL. Radar Defence Systems - 20 Jan 12.30-5.00 pm. Open Day on-site at Crawley, free transport to and from the site, refreshments provided. An opportunity to explore their vacancies for engineering and computer science graduates for 1999 and talk to recent graduates who’ve joined the firm.

**Princes Trust Volunteers** - 20 Jan 5.30 pm, CDU. Talking about their volunteer programme for graduates which offers training and a short term work placement.

Institute of Nursing and Midwifery - 25 Jan 5.30 pm, CDU. Discussing the locally based Accelerated Pathway for Graduates course leading to a Pre-registration Diploma in Nursing.

**Arthur Anderson** - 26 January 5.30 pm, CDU. Find out about their opportunities for graduates seeking a career in finance.

**Computer Training for beginners**

Computer Skills for Absolute beginners on Monday 25 January 6.00-7.30 pm. This course is designed for complete novices who are terrified of using a computer.

**Introduction to Word processing and Windows** on Thursday 28 January 6.00-9.00 pm. This course is designed for beginners and trains participants to manipulate Windows and start to use WORD 6 for Word processing.

All courses can be booked in person at Computer Service reception between 9.00 - 5.00pm. Each course costs £3.00 for members of the University and £20.00 for Non-members.

**Small Ads**

**TO LET**: Large single room in quiet family house overlooking Queens Park. Central Brighton 10 mins, station 20 mins. GCH, W/M, own kitchen, share bathroom. Must be seen to be appreciated. Will suit N/S PG (Female pref). £50p/w, phone excluded (but own line negotiable). Call Liz or John on 605042.

**FOR SALE**: Large two-bed maisonette. Hanover area. £56,950. Tel: 272832 eves.

**FOR SALE**: 2 bed house in Hanover area, £69,950. Please tel: 591543 (eves) for details.

**ACCOMMODATION WANTED**: Research fellow seeks 2-3 bedroom flat/house for 2 adults and 2 children. West Hove area preferred. Please contact Pascal on ext. 8639 or dissardi@biols.susx.ac.uk

**FOR SALE**: A real bargain, a notebook PC (PSION series 3MX, Processor: 16 bit, 27.684 MHz, ROM: 2M, RAM: 2M) with some accessories, the total new purchase price (with a receipt on 29/09/98) is £377.97, quick sale at £250.00. Anyone interested please ring ext. 2598 or e-mail: taiyang@sussex.ac.uk

**WANTED**: Mountain bike. Should be light enough to carry up stairs. Please contact Lena on 620207 or e-mail fcuv3@sussex.ac.uk

**ACCOMMODATION WANTED**: Easter 1999 - Huddersfield University lecturer seeks accommodation for four from March 27 to April 11 inclusive. Brighton or Lewes area, Lewes preferred. Please phone Gina Clayton on 01484 518338 or e-mail SUSBGAMC@pegasus.hud.ac.uk

**WANTED**: House/flat in Lewes area. Research fellow in CCNR/BIOLS & family need 2/3 bed accommodation from 1 April or sooner if possible. Please email davidn@cogs.susx.ac.uk or call David on ext 8754 daytime or 475813 after 6pm.

**FOR SALE**: Toshiba T1900S Notebook with Intel 486DX (25 MHz) processor, 4 MB RAM (expandable to 20 MB), 120 MB hard disk, PCMCIA slot (for modem card, extra hard disk, etc), nickel metal hydride battery and portable Canon Bubblejet b/w printer and carrying case £350 ono. Please contact by e-mail: V.L.Acha@sussex.ac.uk

**FOR SALE**: Cottage, South West France 25 km South of Carcassonne - all mod-cons. Quiet village. 5 rooms + bathroom, sep wc, sunny terrace. Tel/fax: 326693 or email lcu376@susx.ac.uk

**FOR SALE**: Spiral Staircase (except handrail), used to be between Arts B117 and B217, now in component parts. If you're interested, please contact Rob French, Buildings & Services Division, ext 8306, before 22 January.

**FOR SALE**: Electric Guitar - Sunn Mustang. Hardly Used. £50 ono. Phone Vicky Frost on ext 8923 or email V.Frost@sussex.ac.uk

**TO LET**: Room in quiet, friendly house in Lewes on bus route. Female, non-smoker to share with owner. £47 + bills. Call Colette on ext 8555.

**Bulletin**

The Bulletin appears every Friday during term time with copy deadlines the preceding Friday lunchtime. We welcome any suggestions for news, events, letters and small ads from staff and students of the University.

Please contact the Information Office in Sussex House on Ext. 8209 or Email: Bulletin@sussex.ac.uk.