Microbiologist

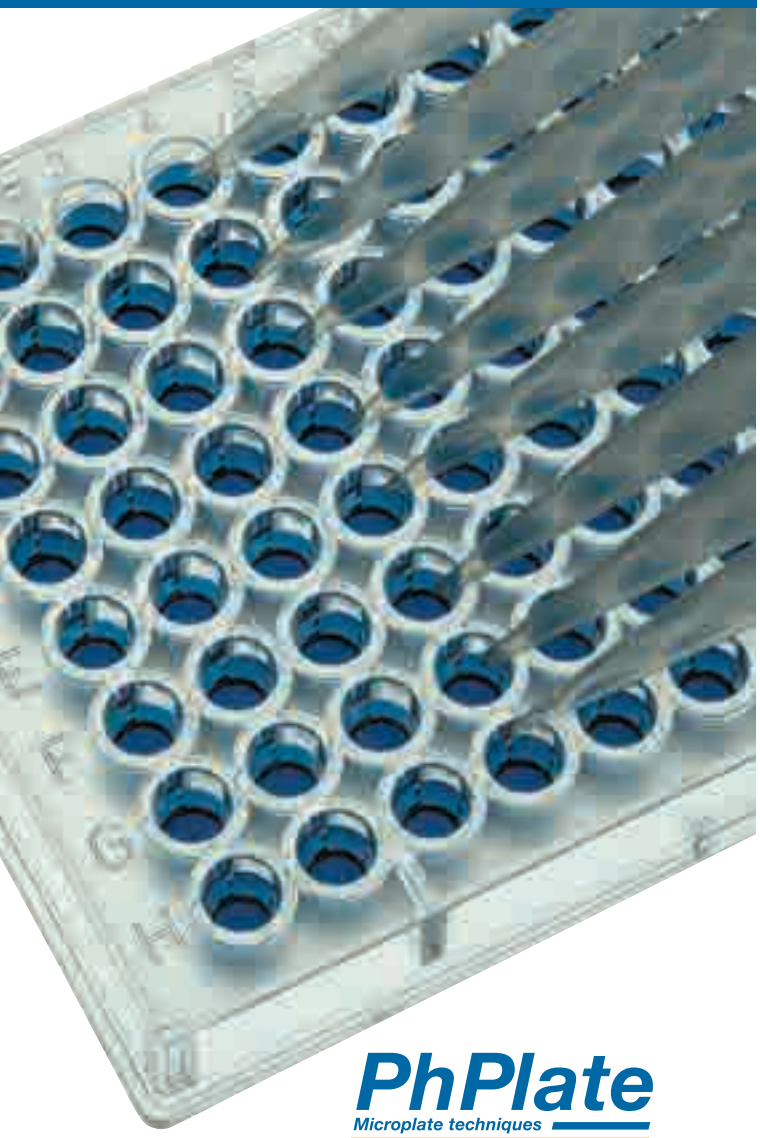
The magazine of the Society for Applied Microbiology ■ March 2003 ■ Vol 4 No 1

Playing God?

American Scientist Craig Venter is trying to create a synthetic life form. The award of a $3 million research grant suggests we should take his work seriously.

ALSO IN THIS ISSUE:

Bacterial Phenotyping



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Microbiologist

The magazine of the Society for Applied Microbiology ■ **March 2003** ■ Vol 4 No 1

Microbiologist
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March 2003

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REGULARS

BSI Update

We apologise for the absence of the BSI Update which will now appear in the June issue

MEETINGS

MICROBIOLOGY of ENGINEERED ENVIRONMENTS 14 - 17 July 2003
University of Surrey, UK

FEATURES

COVER STORY

Microbiologist
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Vol 4 No.3 September
Friday 4 July 2003

Vol 4 No.4 December
Friday 12 September 2003

Vol 5 No.1 March
Friday 12 December 2003

How to submit material
Please submit all articles, reports, meetings notifications, letters etc., as plain text (*.txt) or rich text files (*.rtf). Please submit all images as original photographic prints or transparencies rather than scanned images and these will be processed by us and returned to you promptly. If your images are only in digital format please make sure they are supplied at a resolution of 300dpi (dots or pixels per inch at a size of not less than 100mm (4 inches) square.

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Website: the society website is a timely source of up-to-date information on all Society matters and maintains a comprehensive archive of articles and reports on a variety of microbiological topics.

www.sfam.org.uk

Editorial

Anthony Hilton chews over a few bugs and boldly goes where no microbiologist has gone before...

AROUND THIS TIME undergraduate microbiology students across the UK will be undertaking a major laboratory-based project as part of their honours degree programme. For many this will be the first time that they will have engaged in research where the answers they seek are not already known. In laboratory classes where the end point is pre-determined the final interpretation of the data normally involves little more than deciding if the experiment has 'worked' or not and more often it's the latter! But in novel research it is much more important to try to explain what has happened rather than whether the results fulfil our expectations. If we observe colonies on incubated media as expected then all is well and good, but if we obtain an anomalous result is it a consequence of contamination, poor technique, or have we stumbled upon a fascinating insight into a new aetiological agent? One need only consider the 'discovery' of penicillin by Fleming or more recently the elucidation of the role of *Helicobacter pylori* in gastric disease to see that an experiment may well have 'worked' despite our eagerness to dismiss an unexpected result as erroneous. Maybe many more of the diseases currently without a known causative agent are waiting for someone to ask the question: "Is that a contaminant, or just maybe..?" In this issue Alexandra Perry asks if *Propionibacterium acnes* could be to sciatica what *Helicobacter pylori* is to gastric ulcers? This theme is developed further in a sfam sponsored meeting report by Peter Lambert on page 39.

Star Trek

This year's January conference was on the topic of 'Lab on a Chip - diagnosis and onsite testing'. For me, interesting as the microbiology was, the miniaturisation of devices achievable by the use of nano-scale engineering and the electronics involved was fascinating. At the end of the day, my mind filled with microarrays and nanochips, I retired to my room to prepare for the conference dinner and turned on the television for company. I'm not normally what you would consider a *'Trekkie'* but while scanning the channels I was drawn by Dr. Beverly Crusher instantly healing 'plasma burns' with a 'dermal regenerator' (purely for the science you understand!) This started me thinking about just how far away we might be from reproducing the infamous 'Tricorder' wielded by Dr. McCoy and to what extent fictional technology has been the inspiration for real-life scientists? At dinner opinion was divided as to who influenced whom, however all were in agreement that having learned more of the capabilities of DNA chips it certainly seemed less of a leap of imagination to predict Tricorder-like devices being used in a range of applications. On the other hand a food microbiologist commented that when he talked about *Salmonella* on a chip that was exactly what he meant - beam me up Scotty! See page 32 for a full report on this meeting.

Introducing Anouche

Anouche Newman, a postgraduate research student at Aston Business School, has been working as editorial assistant on *Microbiologist* since October 2002. Anouche has previously worked on the production of magazines during her time with the Alumni Relations Office at the University, so is not unfamiliar with the responsibilities of assisting an editor.

"Before I started working with Anthony on *Microbiologist* I knew absolutely nothing about microbiology or anything to do with the sciences. In fact I couldn't be further away from the topic as my current research is looking at relationship marketing in business-to-business exchanges - a far cry from the world of microbiology! I have found the work of the Society really very interesting and learn something new every week!"

Interest Groups

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info@sfam.org.uk. www.sfam.org.uk

write to:
a.c.hilton@aston.ac.uk

Congratulations

FROM: Rod Herbert
[r.a.herbert@dundee.ac.uk]
SUBJECT: *Microbiologist*

Just a quick email to congratulate you on the format of the newly titled *Microbiologist*. It is a great improvement both in impact and content over it's predecessor *sfam News*. This firmly puts the Society into the 21st century. I look forward in anticipation to receiving the next number.

Brilliant!

FROM: David Wareing
[david.wareing@dynalbiotech.com]
SUBJECT: *Microbiologist*

Congratulations on the new look *Microbiologist*. It is excellent. I hope the work is not getting on top of you, I know how demanding it is. Anyway I would like to help by reviewing a couple of books.

I have received many expressions of encouragement and support over the past few months for the new look *Microbiologist*. On behalf of everyone involved in the production of the magazine I'd like to thank everyone for their comments. It's nice to know our efforts are not going unnoticed.

Anthony Hilton (Hon Editor)

Capital Culture

FROM: Paul Loughnane
[School of Biological Sciences
University of Liverpool]
SUBJECT: The Lost Art of Bacteriology

Following on from the article "The Lost Art of Bacteriology" in the December issue of the Microbiologist, I thought I would send you some pictures of bacterial art we have created at the School of Biological Sciences at the University of Liverpool. We have been running a "Create a culture competition". This is a contribution to Liverpool's bid to become the European Capital of Culture in 2008.

Greedy Reader

FROM: Karen Stanley
[Rowett Research Institute, Aberdeen, Scotland. k.stanley@rri.sari.ac.uk]
SUBJECT: Book Reviews

I Just got my copy of *Microbiologist* - the new look is good. I would be keen to do some book reviews. I'm just revisiting the biofilm literature again at the moment so in particular I would like to do the biofilm books. I know it sounds greedy to do two but "Biofilms: the good the bad and the Ugly" and "Biofilm Community Interactions: chance or necessity?" Both come from the same meeting series, i.e., the Biofilm club's meeting held at Greynog Hall. Have they been bagged yet?

Hawaiian sculpture

FROM: Keith Jones
[Department of Biological Sciences
Lancaster University]
SUBJECT: The Lost Art of Bacteriology

The recent article on The Lost Art of Microbiology struck a chord. When I was teaching in the Department of Microbiology at the University of Hawaii at Manoa in Honolulu in 1986 I took part in the annual microbiology art competition. I did a sculpture using autoclaved plastic Petri dishes, but most people did some sort of bacterial art on agar as described in the article by Adams and Hendry. The competition was judged by members of the University Art Department.

Answers to the December Crossword

Thank you to all entrants of the micro-break December crossword challenge. The winning entry was submitted by **Kevin Charman** from Oxfordshire. Well done to you, your £30 book token is in the post. This time, we have a completely different kind of quiz where you are required to recall your biochemical reactions to identify the microorganism. The biochemical reactions detailed in the table can be used to **speciate the 25 Gram-negative, nitrate-positive bacilli that can be isolated from faeces.** Just so that the quiz is not too simple for you expert microbiologists we have included a few nasty ones to blow you off the scent! Remember, not all reactions are guaranteed at 100% so there are a few exceptions to the norm. For example, organism A corresponds to bacterium number 1; *Escherichia coli* O26. This serotype can be urea positive while the majority of *E. coli* are urea negative! All correct entries received in the Society office by 25 April will again be stuffed into the editors lab-coat pocket and the winning entry drawn by an independent referee. Answers will appear in the June issue of ***Microbiologist***. A **£30 book token** is up for grabs - so get puzzling!

	Glucose Peptone Water	Mannitol	Indole	citrate	Urea	ONPG	Lysine decarboxylase	Ornithine decarboxylase	Phenylaline deamination	KCN utilisation	YOUR ANSWER
A	A+G	+	+	-	+	+	+	+	-	-	
B	B	+	-	-	-	-	+	-	-	-	
C	A+G	+	+	-	-	+	+	+	-	-	
D	A+G	+	-	-	-	-	-	-	-	-	
E	A	+	+	-	-	-	-	-	-	-	
F	A+G	+	-	-	-	-	-	+	-	-	
G	A+G	+	-	+	-	-	+	+	-	-	
H	A	+	-	-	-	+	-	+	-	-	
I	A	-	+	-	-	+	+	+	-	-	
J	A	-	-	-	-	-	-	-	-	-	
K	A	-	-	-	-	+	-	-	-	-	
L	A+G	+	-	+	-	+	-	+	-	+	
M	A+G	+	-	-	-	-	+	+	-	-	
N	A+G	-	-	+	+	-	-	+	+	+	
O	A	+	+	+	+	-	-	-	+	+	
P	A+G	-	+	-	+	-	-	+	+	+	
Q	A+G	+	-	+	-	+	+	+	-	-	
R	C	+	+	+	+	+	+	-	-	+	
S	A	+	+	-	-	-	-	-	-	-	
T	A	-	+	-	-	-	-	-	-	-	
U	A	+	+	-	+	+	-	+	-	-	
V	A+G	+	-	+	-	+	+	+	-	+	
W	A+G	+	-	+	+	+	+	-	-	+	
X	A	-	+	+	-	-	-	-	+	+	
Y	A+G	+	-	+	+	+	+	+	-	+	

KEY ONPG (0-nitrophenyl-β-D-galactopyranoside)
A+G = acid and gas production. A = acid production only

List of Gram-negative bacteria

Escherichia coli O26

Salmonella typhi

Shigella flexneri 6

Shigella flexneri (1-5)

Salmonella paratyphi A

Plesiomonas shigelloides

Proteus mirabilis

Klebsiella oxytoca

Shigella boydii

Yersinia enterocolitica (biovar 1)

Shigella dysenteriae 1

Providencia rettgeri

Salmonella subgenus III (formerly *S. arizonae*)

Hafnia alvae

Citrobacter freundii

Escherichia coli

Salmonella sp. (most serotypes)

Shigella dysenteriae (serotypes 3-12)

Klebsiella aerogenes

Shigella sonnei

Morganella morganii

Shigella dysenteriae (serotype 2 -Schmitz's bacillus)

Salmonella pullorum

Enterobacter aerogenes

Providencia stuartii

A £30 book token is waiting for the person whose entry is drawn from the editor's lab-coat pocket first! The closing date for entries is **Friday 25 April 2003**. The answers will appear in the next issue of the ***Microbiologist***.

Name: _____

Address: _____

Simply photocopy this page and send it to:
'Biochemical Challenge', Society for Applied Microbiology,
The Blore Tower, The Harpur Centre, Bedford MK40 1TQ, UK.
Remember, you could win a £30 Book Token!

New Members

We would like to warmly welcome the following **new members** and hope that you will participate fully in the activities of the Society.

Brazil

Mr C A Crispim

Eire

Ms T Catarame

Germany

Mr J M Mathara

The Netherlands

Mr K Roest

Nigeria

Mr V Nweze

Sudan

Mr A M Osman

United Kingdom

Mr K M Aljarallah; Mr Bahrami; Miss S Barclay: Mrs J M Barnett; Miss L Brevik; Mr T Calvert; Mr C C Clarke; Mr D Dertzakis; Dr A R Eley; Miss T Gallagher; Miss R Guppy; Dr A Horsburgh; Miss G K Hughes; Mr C Ibenegbu; Miss J M Inman; Miss C Iversen; Miss S M James; Mr V S Jayamanne; Dr P A Lambert; Miss I Lazaraki; Mr S Maktabi; Mr A Miah; Mr D M Pearce; Mr M J Pogson; Miss S J Rhead; Mr G M Robinson; Miss J Rollason; Mr S More; Miss C F Smith; Miss V Stergiou; Miss K V Tyldesley; Ms C Van Ijperen; Mr P-A Wasu; Mr P Wheat; Miss M Zhang

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Ms A Lekhwani; Mr C Steinel

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the **President's Column**

Dr Peter Silley pays tribute to Dr Betty Hobbs and explores the often forgotten work hidden in old journals

I WAS SADDENED to hear of the death of Dr Betty Hobbs. A fitting tribute has been paid By Jim McLauchlin on page 12 of this issue, yet I cannot refrain from reproducing part of a paper from Dr Hobbs which was published in 1950 in Volume 30 of the Proceedings of the Society for Applied Bacteriology (the former name of sfam). I am privileged to have almost a full set of Society Journals beginning from 1950 (if anyone knows of the whereabouts of any journals prior to this date I would be pleased to give them a good home!) When opportunities arise and I find myself with some "free" time I will pick out one of the old journals and begin to browse. I guess one of the disadvantages of the electronic age is that browsing in this way will no longer be quite so easy which will be such a pity as there is some fascinating and often forgotten work hidden within those old journal covers. As an example cast your eye over extracts from this paper from Dr Hobbs, entitled "The Hygiene of the Preparation and Service of Food."

"Four factors are necessary for the occurrence of food-borne infection, the infecting organism, a reservoir or normal habitat where it can live and multiply, a vehicle or channel for spread - such as water, milk or other foodstuff - and susceptibility of the group of people exposed. Frequently there is what almost might be named as a fifth factor - the hands of the food handler conveying the organism from reservoir to vehicle.

To control these infections and interrupt the cycle of events the communications must be cut at some point. The function of hygiene is to seek out the weak links in the chain, to break them, and thus to block the spread of infection. Its successful application depends on knowledge gained not only at the laboratory bench but also from experience of epidemics in the field, of the types and habits of the infecting organisms.

During the last 50 years or so there have been vast improvements in the hygiene of milk and water supplies, in sewage disposal and fly extermination, so that the incidence of intestinal infections such as typhoid fever and infantile enteritis has declined sharply while cholera has disappeared completely from this country. Yet in one of the most important spheres of life, that of food production, preparation and service, there remain faults in hygiene which result year by year in a steady and ever-increasing number of food-poisoning outbreaks. The figures have risen from 83 in 1939 to 964 in 1948 and 2,431 in 1949.

There are two predominant reasons for this rise. First, the increase in communal feeding carried out often with acute shortage of space, staff and equipment. Investigations into the cause of outbreaks affecting school and factory canteens have revealed errors in the hygiene of handling food prepared in bulk which have adversely affected large numbers of people but which may well have been overlooked in households where one or two members only of a family might suffer.

Second, improved diagnosis as a result of increased laboratory facilities and finer bacteriological methods, together with more activity in fieldwork have led to a more precise appreciation of the situation. Other factors, such as shortage of food and consequent reluctance to discard leftover portions, and the increased consumption of made-up meatstuffs, have also contributed to the rise in incidence.

The oviduct of ducks may be infected by S. typhimurium and lead to true infection of their eggs. There may be two, three or more outbreaks each year from this cause; the figure is low when it is considered that there are approximately 2 million ducks in the country. As a safety measure the Ministry of Health have ruled that duck eggs should be boiled for 10 mins.

Spray-dried egg powder may contain a variety of Salmonella organisms believed to have originated from infected hen faeces adhering to the shells. Lightly scrambled dried egg or lightly cooked omelettes made from dried egg may cause food-poisoning, particularly if the reconstituted egg has been allowed to remain for a few hours or more at room temperature, thus permitting the organisms to multiply.

After describing briefly our existing knowledge about food-borne infections it is natural to point out where hygiene can break the links of the chain or block the channels of spread of infection from reservoir to susceptible host. The first of the links is the hands of the food-handler which must be kept scrupulously clean.

Particular care should be taken before handling cold foods not receiving further heat-treatment. In instances where, in spite of treatment, a person is found to be a persistent hand carrier of an enterotoxin-producing strain of Staphylococcus, precautions should be taken to prevent him or her handling susceptible foods. The second link is the storage of food. The temperature at which food is kept is a vital factor in the causation of food-poisoning and the importance of refrigeration, particularly in the

summer, cannot be stressed too highly. Large volumes of stews and gravies which cannot be cooled rapidly are particularly dangerous and should be broken down from bulk into smaller quantities to assist cooling unless special cooling apparatus is supplied.

There is much competition among industrial concerns in the production of efficient detergent substances and indeed there are many excellent preparations on the market which are useful in practice. These include both inorganic and organic substances as well as mixtures of the two. Unfortunately there are as yet no really satisfactory laboratory tests for ability to cleanse. Promising work on bactericidal substances as aids to washing-up procedures have been carried out by a few manufacturers.

There are probably many known and unknown weak links in the chain of infection from the reservoir through the vehicle to the victim, but scrupulous attention to the two important factors of clean hands and refrigeration would do much to eliminate the hazards of food poisoning."

Clearly HACCP was alive and well and Salmonella and eggs were already an issue, yet there were no real tests to determine efficacy of cleaning. It is pleasing to know that we have made progression since those times but let us not ignore the tremendous work of those who have gone before us and which is published within our Society Journals and those of other learned societies. □

Peter Silley
Peter Silley is the Hon President of the Society and Research Director of Don Whitley Scientific Limited

There is a tribute to Dr Betty Hobbs by Dr Jim McLauchlin on page 12

Sponsor of the Year 2002

We are delighted to announce the winner of the sfam **Sponsor of the Year** award as our very own editor of ***Microbiologist,*** **Anthony Hilton.**

Anthony beat off stiff competition in a race to the wire to emerge as having recruited the most new members to the Society in the 2002-2003 period. When informed of the award Anthony was surprised to have won and reluctantly accepted the £50 book token saying he would pass it on to his wife as a gift! Congratulations and thank you on behalf of the Society for your recruitment efforts.
The recruitment competition has proved very successful over the past two years and so we are again wiping the slate clean, offering another £50 prize and inviting members to get recruiting. Could you be our next winner?

Sponsor a new Member and win a £50 Book Token!

Could you be the next winner of the 'sfam Sponsor of the Year' Award?

If you feel you could be our next winner for 2003, and would like some promotional material to help you recruit new members please contact Julie Wright, Membership Co-ordinator on 01234 326661 or email julie@sfam.org.uk.

Sfam visits IUMS in Paris

THE INTERNATIONAL UNION of MICROBIOLOGICAL SOCIETIES (IUMS) comprises three Divisions; Virology, Mycology and Bacteriology & Applied Microbiology. Every three years the Divisions organise an international congress, often in conjunction with one or both of the other two Divisions. A combined International Congress at which all three Divisions were represented took place in Paris, 27 July - 1 August 2002. In addition to a large scientific programme, there was a trade exhibition at which the Society had a stand, as did Blackwell Publishing. There were nearly 4000 delegates to the congress.

Margaret Patterson and Alan Godfree represented the Society and manned the stand during the four days of the exhibition. It was a great pleasure to meet Society members from the UK and elsewhere as well as a number of the Editorial Board of the journals.

There was a lot of interest in the Society, in particular the range of grants and awards available to members. Society pens, mouse mats and coasters were very popular and quickly disappeared from the display! Many visitors enquired about the Society's journals and prospective authors were interested in submitting papers to either Letters in Applied Microbiology or the Journal of Applied Microbiology, attracted by the lack of page charges and forthcoming online submission.

The Society is a member of IUMS and eligible to attend the General Assembly and vote on resolutions which we duly did. The next IUMS Congress will be in San Francisco during July 2005.

Margaret Patterson & Alan Godfree
Margaret Patterson is the Hon. Gen. Secretary of the Society and Alan Godfree is the Hon Editor of The *Journal of Applied Microbiology*

For more information about IUMS visit: http://www.iums.org

Do you know a young microbiologist (under 40 years of age) who has made a substantial contribution to microbiology? If so, why not nominate them for this prestigious and substantial award which is worth £2,000? The award was instituted in 1984 by Oxoid to commemorate the life and works of the late W H (Bill) pierce, former chief bacteriologist at Oxoid Ltd and a long-time member of the Society. The prize is presented annually at the summer conference. Members wishing to make a nomination for the 2003 prize should write in confidence to the Hon General Secretary, Margaret Patterson, at the Society Office in Bedford, including a full cv of the person nominated and a letter of support. Please note there are no official forms for this award.

Closing date for nominations is 30th April 2003.

Honorary membership

The Society is delighted to confer honorary lifetime membership on Professor Arthur Gilmore, Honorary President of the Society 1999 - 2002, in recognition of his services to the Society.

SfAM Statement on Biological Warfare

In light of current worldwide concerns regarding weapons of mass destruction Committee discussed the introduction of an ethics statement to which we would ask all members to subscribe. During the discussions we realised the difficulty in finding an appropriate form of words to adequately address the subject. It initially seemed a rather straightforward matter but of course it soon becomes clear that it will be necessary to continue to work with organisms of concern in order to prepare defensive strategies to their potential use as organisms of mass destruction. We are currently looking to introduce the following statement which will, in the future, appear on new membership application and renewal forms.

"The Society requires each member to behave in such a way as to bring credit to the profession of microbiology and not to knowingly engage in work directed towards the production, promotion, sale or transfer of biological weapons."

We welcome member's comments as to the suitability of this statement.

Membership changes 1 June 2001 TO 31 May 2002

Election of New Members

The following have joined the Society during the period from1 June 2001 to 31 May 2002 (*denotes Full Student Member; **denotes Associate Student Member):

Abdelaziz AA (Egypy); Abulreesh HH* (Hull); Alboraie S* (Manchester); Allen V (Bristol); Alzwei A* (Glasgow); Amisu KO* (Nigeria); Avery LM (Wales); Bardowski JL (Poland); Barrigas ML* (Staffordshire); Baumann F (Germany); Bjorland J (Norway); Boziaris I (Greece); Brenneman K** (USA); Buckley R (Lincs); Caddick JM (West Midlands); Camilleri C* (Malta); Casey PM (Kent); Cenci-Goga BT (Italy); Chatwell N (Salisbury); Christensen KK (Denmark); Christopher D (Bristol); Codling C** (Cardiff); Coleman DJ (Birmingham); Connerton I (Loughborough); Connor S (Manchester); Corbitt AJ (Wiltshire); Cottell A** (Brighton); Dargan P (India); De-Luca N (Herts); Ebrey RJ* (Exeter); El-Domani RA* (Egypt); English J** (Lancaster); Eyles RF* (New Zealand); Fauque GDJ (France); Feeney CAM* (Derby); Fitzgerald DJ* (Norwich); Fowler EK (Worcester); Gibson SA (Worcester); Girardin H (France); Gleeson D (Ireland); Goodburn K (London); Grant RJ (Ireland); Griffiths H (Middlesex); Haesebrough F (Belgium); Hasan A (Kuwait); Hayes R* (Wolverhampton); Henderberg A (USA); Hickie SJ (Kent); Hill DJ (Wolverhampton); Hill PJ (Leicester); Hussain AL-Diwany LJ (Karak); Huston E (USA); Jones O (Gwynedd); Kagawa S* (Japan); Kearney L (Ireland); Khanna S (India); Khondkar P* (Glasgow); Law K (Scotland); Lawley S* (Staffordshire); Leis A (Germany); Lemar KM* (Cardiff); Lenaerts J* (Exeter); Lewis C (Glasgow); Likotrafiti E* (Berkshire); Livens S (Surrey); Lord DC (Merseyside); Lowe CA (Glasgow); May JP (Wirral); Mayers C (Wiltshire); McCleery DR (Northern Ireland); McCulloch L* (Liverpool); McDermott PJ (Merseyside); McMahon V** (Bedfordshire); McMullan SE* (Co. Antrim); McQueen J (USA); Meiklejohn GR* (Glasgow); Middleton AM (Surrey); Muckian L** (Ireland); Mugg PA (Surrey); Nelson S (Bristol); Ohai C (London); Oliver R* (Portsmouth); O'Malley LP (Manchester); Parry J (Lancaster); Patel B (Essex); Pearson E (Kent); Pierce KJ* (Edinburgh); Prajapat VD* (London); Prest C* (Cheshire); Preston S (Aberdeen); Redmond EC (South Wales); Rees E** (Cardiff); Renaud-Francois (France); Requena R (Brazil); Rix A (Australia); Robinson G* (Bedfordshire); Robinson LS* (York); Rogers AJ** (West Surrey); Sattar SA (Canada); Sekizuka T* (Japan); Seyfried M (Switzerland); Sheldrake I (Basingstoke); Smith Richard (Herfordshire); Smith W* (Newcastle upon Tyne); Spode BP (Worcester); Srivastva D (USA); Stehn B (Sweden); Stephenson G (Newcastle upon Tyne); Tangney M (Scotland); Vassilandonopoulou G (Greece); Wang RY (Luton; Bedfordshire); Watson AP* (Manchester); Weaver L* (Hants); Webb T (Surrey); Whitehead KA* (Lancashire); Whyte FW* (Manchester); Williams C (Hull); Winkler A (Germany); Zavaleta AI (Peru)

Totals

Full Members:	77
Full Student Members:	34
Associate Student Members:	8
Total:	**119**

Corporate Members

Eli Lilly & Company Ltd
PhPlate Microplate Techniques
Total: 2

Resignations

The following have resigned their membership:

Abaye DA (1998); Bacon CL (1994); Baldry MGC (1982); Barker M (1989); Baumgart J (1972); Bertrand* N (1998); Beveridge EG (1975); Collins JE (1995); Crowther JS (1968); Crowe ML (2000); Davidson CA (1991); Danielsen M (2001); Davies I (1996); Dent CL (1996); Dodman RI (1993); Drasar BS (1987); Fricker EJ (1992); Gentle NS (1991); Gibson LF (1963); Glascock SJ (1996); Gonzalez MI (1999); Gordon* JA (1999); Gow MM (1993); Gravesen A (2001); Halls NA (1969); Inwood CJ (1990); Johnson A (1999); Johnson* HE (1998); Karaioannoglou P (1978); Karnes LP (1973); Kerr AR (1996); Lamlerthon* S (1997); Leistner LEE (1976); Magee AC (1993); Martin KW (1998); Mason T (2001); Matthews SCW (1987); McDermott PJ (1998); Milohnoja M (1973); Morgan* J (1997); Owen E (1975); Page A (1996); Page SL (2001); Parry OT (1984); Pinegar JA (1975); Purohit KS (1994); Robertshaw AH (1970); Rombouts FM (1987); Roulston H (2000); Shapton D (1955); Shapton NF (1975); Simmering R (1999); Smith RN (1986); Smith QJ (1977); Snell JJS (1977); Spink* P (1999); Stanbridge LH (1991); Stanley G (1975); Stewart CS (1971); Stone MR (1985); Sunde M (2001); Sutcliffe IC (1999); Thomas JI (1978); Thomas** L (2001); Turner DG (1972); Uppington** H (2001); Van Schothorst (1977); Warren GC (1969); Warren IC (1978); Whitehouse P (1994); Wilde SJ (1987); Williams AJ (1979); Williams RG (1980); Wouters JTM (1988); Yearbury BJ (1989).

Totals

Full Members:	67
Full Student Members:	6
Associate Student Members:	2

The following deaths were noted with deep regret:

Acaster H W; Cross T; West P A

Total: 3

The following members have been written off for non-payments of subscriptions:

Abdel-Khalek A; Ahmad MH; Anderson WA; Beaton Y; Beattie SH; Bellian T; Bell-Perkins L*; Benson D; Bicknell B; Bourke P*; Boyd Y; Brodie E*; Bull S; Callaghan KD; Carmichael D*; Casci T*; Castle CS; Chan HEW-Y**; Chymera O; Colles F; Collins SB; Dalamitra S*; Dayyani Dardashit A*; Deegan MB; Devi P; Devillard E*; Di Candia M**; Dunsmore BC*; Endacott-Palmer CA; Etoa F-X; Eull A; Ezzi M*; Ferguson CMJ; Fernandez Astorga A; Fitzpatrick L; Fleet GH; Fooks LJ*; Forsdyke JD; Foster AG; Foster SJ; Galhotra AP; Gassem M; Gondo T**; Gorman SP; Granger A*; Gregory JE; Griffiths PA; Hallsworth R; Hanmoungjai P*; Hawronskyi J-M; Hegarty JP*; Holmes K*; Horton SJ*; Hoyles L*; Ireland P; Jagannathan A**; Jain MK; Jaisli FK; Jaramillo-Rivera H*; Jensen BB; Jepson M; Jermini MFG; Jones CE; Jones SM*; Kadhum HJ**; Kagawa S**; Kalogeropoulos V; Karayinnis V; Kaspersson AS; Kershaw SJ; Khan MR; Khanna S; Kim D; Koulouris S; Laborda F; Lane E; Law D; Lee A; Leitch I*; Liow EWM*; Lynam B**; Lynch FJ; Masters PJ; Mavinkurve S; McCann C*; McKenna E; Moore LE*; Moore GF*; Mortimer AD; Mullen K; Murano E; Murrin K; Noonan P; Nunn FG*; O'Brien A*; Oh H-B; Ojo B*; O'May GA*; Panisello PJ; Payne JF; Paynter MJB; Potter CA; Prendergast DM*; Quennell SI; Quevedoradu FG; Radu S; Rickard AH*; Robinson T; Rooke JK; Rossmoore H; Rowland YM; Ruegg JR; Ruiz-Teran F; Rushby LN; Saadoun I; Schwingel WR; Scott MF; Simmons NA; Sladersmith J; Smith GP; Smith S; Sperber WH; Tatton AC; Taylor PJ; Taylor F; Teferedegne B*; Teo A; Thirlwell JM; Thompson DE; Townend TJ; Turner NA*; Turner HL**; Tzortzis G*; Upton ME; Uvey M; Vidal DR; Vilkhu KS; Vincent S*; Waak E; Wade MG; Walker JT; Webster SD; Wells JM; Welsby S**; Wheat PF; Williams O; Williams K; Williams V; Wood MA; Ziemer C; Zigorraga C.

Totals

Full Members:	106
Full Student Members:	34
Associate Student Members:	9
Total:	**149**

Call for Nominations for Committee

Mr John Waddell, Dr Jean-Yves Maillard and Dr Martin Adams are scheduled to retire from the Committee by rotation in July 2003. Nominations are invited from full members of the Society for three new members of Committee. Nominations must be made in writing and received at the Society Office by 20th May 2003. Should nominations exceed vacancies, election will be by a system of postal voting arranged by Committee.

Tribute to Dr Betty Hobbs

DOCTOR B C HOBBS or Betty as she was more affectionately known to those who worked with her, completed her PhD *(titled "An examination of various factors affecting the reduction of methylene blue in milk, and the influence of cultural conditions on the yield of metabolites produced by certain species of fungi")* with Sir Graham Wilson at the London School of Hygiene and Tropical Medicine in 1937. She then joined the Emergency PHLS in the Cardiff Laboratory early in the Second World War and remained in the PHLS for the rest of her career until retiring in 1975. She was Director of the Food Hygiene Laboratory from its inception in 1947 until retirement. During her career, Dr Hobbs published prolifically on many aspects of food microbiology, food poisoning and food hygiene and produced more than 140 papers and articles. Her first book *"Food Poisoning and Food Hygiene"* first published in 1953 remains (after many editions) a standard text.

Dr Hobbs is probably best recognised for her pioneering work on establishing *Clostridium perfringens* as a cause of food poisoning. *C. perfringens* was first reported as a cause of food poisoning in the USA in 1945 where nausea and diarrhoea was reported in three outbreaks after consumption of chicken which had been cooked the day before consumption (McClung, 1945). The foods were heavily contaminated with *C. perfringens* and it was suggested that a toxin had been produced in the foods. However, in 1953 a ground breaking paper was published by Dr Hobbs and colleagues which established *C. perfringens* food poisoning on a much firmer basis by providing information on the epidemiology, disease presentation, diagnosis, pathogenesis and control (Hobbs *et al.*, 1953). This paper characterised a large numbers of outbreaks and showed that a high proportion of food poisoning of unknown origin was due to *C. perfringens* (then named *C. welchii*). The paper presents a vast amount of data showing that almost all outbreaks were caused by meat which has been cooked and allowed to cool slowly: the cooking process being unlikely to kill the organism because of its ability to produce endospores and consequent

heat resistance. Following consumption of the food, colic, diarrhoea but rarely vomiting occurred after 8-20 hrs which resolved after about 1 day. There were large numbers of *C. perfringens* in the food and faeces of patients and since this bacterium was commonly found in the faeces of animals, this represented the likely source of contamination. Human volunteer experiments were performed by consumption of cooked meat broths. The requirement for consumption of live organism to cause disease (and not toxin) was demonstrated by the development of diarrhoea only following consumption of live culture in cooked meat broths. The disease was not produced following consumption of uninoculated broths or the filtrate from inoculated broths. It was subsequently shown that infection resulted from the production of enterotoxin in the intestinal tract during the sporulation of this bacterium.

Dr Hobbs was highly active in many other areas of food hygiene. For example, she was a founder member of the International Commission on Microbiological Specifications of Foods, a group of expert international food microbiologists who first met in 1962 and whose primary goal was to foster the concept of microbiologically safe foods in international commerce. She was also a tireless educator and lecturer, spoke to audiences of widely differing experience such as Woman's Institutes and Townswoman's Guilds through food law enforcers, academia, and the scientific world at large, both in the United Kingdom and world-wide.

Betty was not only a dedicated scientist, but also gave her time to others not involved in her specific area of work. She was involved with the St John's Ambulance Association and was a Sister of Order of St John. She was a committed Christian and worked for the Ludhiana Fellowship. In the early 1970s when the Hospital and Medical College in the Punjab (India) was short of Pathology Laboratory staff she responded and gave up her holidays each year to spend time working in the laboratory. From her retirement in 1975 she spent three to six months of each year working in Ludhiana, unpaid, at the laboratory bench.

C.perfringens food poisoning continues to be a significant problem today in both the UK and USA, and advice on the control of this disease remains as it was in given in 1953 by Dr Betty Hobbs and colleagues in their outstanding paper which is now 50 years old:

"Outbreaks of this kind should be prevented by cooking meat immediately before consumption, or if this is impossible, by cooling the meat rapidly and keeping it refrigerated until it is required for use."

Dr Jim McLauchlin, FSML

Further reading:

- Hobbs BC, Smith ME, Oakley CL, Warrack GH, Cruickshank JC. (1953) ***Clostridium welchii* food poisoning**. *J Hyg* 51 75-101
- McClung LS. (1945) **Human food poisoning due to growth of *Clostridium perfringens (C.welchii)* in freshly cooked chicken:** preliminary note. *J Bact* 50 229-31.

In Memoriam: Martin J Wood

The Society for Applied Microbiology extends heartfelt condolences to the family of Martin J Wood, President of the British Society for Antimicrobial Chemotherapy who died suddenly in the early hours of Sunday 15 December 2002. As President and immediate past Editor-in-Chief of the Journal of Antimicrobial Chemotherapy he had made a major contribution to the development of BSAC in recent years.

Annual General Meeting 2002

THE 71st ANNUAL GENERAL MEETING of the Society for Applied Microbiology was held on Wednesday 10th July 2002 in the Lecture Theatre on the Jubilee Campus of the University of Nottingham commencing at 17.45 hours. The Honorary President, Professor Arthur Gilmour was in the Chair and 37 members were present.

1. Apologies for absence

Apologies for absence were received from Mr Les Baillie, Dr Ron Bishop, Dr Muriel Rhodes-Roberts, Professor Colin Harwood, Mr John Waddell and Miss Charlotte Lindhardt.

2. Minutes of the Annual General Meeting held in July 2001 at Swansea University

Copies of the minutes of the previous meeting were circulated to those present. The Chairman asked if these were a true and accurate record of the meeting. There was no dissent and the minutes were accepted.

3. Matters arising

The Chairman asked the meeting if there were any matters arising from the last AGM minutes - there were none.

4. Report of the Trustees of the Society for the year 2001

Copies of reports of the Trustees had been and were distributed to all members attending the meeting. As reported at the last AGM, full accounts were produced and circulated to members earlier in the year enabling scrutinisation of accounts and the Annual Report before the AGM.

4(i) Report of the Honorary President

Professor Gilmour reported that there had been staff changes in the Society office which Dr Margaret Patterson, Honorary General Secretary, would discuss in her report.

Professor Duncan Stewart-Tull who retired from his post as Editor in Chief as from July 2001 had not been replaced. However, the role was taken on by Professor Colin Harwood for LAM and for JAM, Mr Alan Godfree.

Dr Peter Silley, Honorary Vice President, had stepped down from his post as Honorary Treasurer and the role taken on by Dr Geraldine Schofield.

Dr David Wareing initially took on the post SfAM News Editor, but sadly, due to personal reasons, had to resign from this role in December 2001. Dr Anthony Hilton kindly agreed to take over as SfAM News Editor.

Professor Gilmour then reported on a very successful 'Away Day' that the Society had held in January this year to discuss 'Strategic Review/Planning' and the way forward for the Society. Many new ideas and initiatives were discussed which will hopefully take the Society forward into 2003. The following key issues emerged:-

Website development - Dr Anthony Hilton to take forward.

Synergy with other organisations such as UK Life Sciences.

To implement 'local' branches - agreed however not to progress.

Audience requirements - Dr Peter Silley to take forward with a view to establishing an Advisory Board.

Membership issues - a sub-committee has been formed and will be run by Dr Valerie Edwards-Jones, Dr Peter Green and Mr John Waddell.

Promotion of the Society - a Working Group is to be formed by Dr Jean-Yves Maillard, Dr Hilary Dodson and Dr Martin Adams.

Professor Gilmour said that it would be his last report to the AGM as he was now to step down as Honorary President. It had been an honour to have served as President to the Society and had felt privileged to have served in this capacity. Professor Gilmour then thanked the Officers, Members and Office Staff for all their hard work and enthusiasm. Professor Gilmour asked those present for any questions or comments and there were none.

4(ii) Report by the Honorary General Secretary

Dr Margaret Patterson, Honorary General Secretary highlighted points from the Trustee report distributed to all those attending the AGM. In particular, she reported on the office/staff changes that had recently taken place. Mrs Alison Devereux, Office & Events Manager, had resigned from her post in June to take up a new life in Spain. Ms Lynne Boshier had been appointed as the Office & Events Manager and would be taking up her post at the end of July. Miss Rashina Ganger, full-time Clerical Assistant, had also been appointed in June. In closing, Dr Patterson thanked Mrs Devereux and Ms Julie Wright for all their support and hard work over the past year. Miss Linda Copperwheat, temporary clerical support, who had worked for the Society for three months during the period of change was also thanked for her support and hard work. Dr Patterson then asked if there were any questions or comments and there were none.

4(iii) Report by the Honorary Treasurer

Dr Geraldine Schofield highlighted points from the Trustee report. Dr Schofield reported on the new accounting year which now runs from January to December and because of this, the most notable feature of the audited financial statement of the Society is the extended period of accounts, 1st June 2000 to 31st December 2001. The draft budget set for the extended period was then discussed. She confirmed that the budget performed better than was anticipated, mainly due to increased income from the society's journals, lower than expected costs of Environmental Microbiology and tight budget control of office expenditure. Dr Schofield then reported that the Society's investments had recovered after the fall, due to stock market pressures, to lie 1% lower than their market valuation at this time last year and overall the investment portfolio had performed well. In conclusion, the budget is on target for 2002 and the Society's finances in general are healthy. Dr Schofield then asked those present if there were any further questions and there were none.

4(iv) Report by the Honorary Meetings Secretary

Mrs Margaret Harrison, Honorary Meetings Secretary highlighted points from the report distributed to all those attending the AGM. Mrs Harrison reported that it had been an active year with a successful Joint Winter Meeting in Wageningen, The Netherlands, that had an excellent scientific content and a Summer Conference in Swansea 2001. Mrs Harrison then thanked Professor Duncan Stewart-Tull, Professor Hugh Pennington and Professor Graham Rook for their excellent contribution to the debate 'A Little Bit of Dirt does you Good' debate held on the opening evening of the 2002 Summer Conference at Nottingham University. The Winter Meeting 2003 entitled 'Lab on a Chip' is to be held at the Holiday Inn in Birmingham with Dr John Coote arranging the scientific programme for this event.

This is a move towards the use of hotels rather than Universities for future meetings. The Summer Conference 2003 will be held at the University of Surrey and is in association with the Institute of Civil Engineers. Dr Tony Chamberlain is the convenor for this meeting. Mrs Harrison also reported that the current convenor, Dr Jean-Yves Maillard, for the Infection, Prevention and Treatment Group will be replaced by Dr Susannah Walsh. Mrs Harrison asked for any questions or comments from those present and there were none.

4(v) Report by the Honorary Editors

Mr Alan Godfree reported that 60% of members have activated Blackwell Synergy to receive their journals on-line. Mr Godfree reported the he was conscious of the need of authors for manuscript reviewing and handling times and Dr Bill Ashraf had been appointed as Reviews Editor to cover both JAM & LAM. Electronic submission of articles will go live between September - January. Mr Godfree extended his grateful thanks to the Blackwells Team and all the reviewers for the journals. Dr Keith Jones raised a question concerning the new location of the Blackwell's Office as this was due to close in the Autumn and possibly move to Oxford and asked how this would affect the current workings of the Editorial Office.

4(vi) Report by the SfAM News Editor

Dr Anthony Hilton reported on the forthcoming new developments to be seen in the SfAM News and website development. They are as follows:

The News will have more scientific content. The SfAM News Editor will commission authors to write articles. The overall appearance of the News will have a 'facelift'. A 48-page all colour edition will be launched in the December issue. The News will have a change of name to reflect the new appearance.

The Society website will be developed to incorporate a public access area, an exclusive members' area, a discussion/chat forum, a job vacancies/job seekers list, student members section, a list of forthcoming papers that will be appearing in the journals and a facility to collect information on members including updating members' special interests. Dr Stephen McGinness raised the question concerning the updating of members' information. Dr Hilton replied that it is anticipated that the website should represent the major mechanism by which members who were able could update their information. It was, however, recognized that not all members have ready access to the Internet and a postal support system would also be available. The new database would be designed to be compatible with the existing information database already used in the office.

5. Adoption of Annual Report 2001

Professor Gilmour then asked for these reports to be officially adopted by those present. Mr Fred Skinner proposed and Professor Max Sussman seconded this proposal. Professor Gilmour thanked them both for their contribution.

6. Election of Honorary President

Professor Gilmour reported that that Dr Peter Silley was to now take over the role of Honorary President after having been elected Honorary Vice President last year. Professor Gilmour proposed that Dr Silley become the next President and this was seconded by Dr Bob Park. Professor Gilmour then congratulated Dr Silley on his new appointment.

7. Election of two members to Committee

Dr Margaret Patterson reported that this year there were two committee vacancies to fill as Dr David Wareing and Mr Les Baillie had retired. Two nominations were received from Society members and the membership then voted for Dr Ian Fevers (nominated by Professor Colin Harwood) and Dr Julie Eastgate (nominated by Dr S Cave). Dr Patterson proposed that these be elected onto Committee and this was seconded by Professor Max Sussman. Dr Patterson welcomed them both onto committee.

8. Election of new/reinstated Members

Full details of Membership changes from 1 June 2001 to 31 May 2002 can be found on page 11.

9. Deaths & Resignations

Dr Margaret Patterson, Honorary General Secretary, highlighted the main points from the report prepared by the Membership Co-ordinator which was distributed to all members present.

10. Any other Business

Dr Fred Skinner, Custodian Trustee of the Society, thanked all on committee, the officers and staff for all their continued hard work over the past year and proposed a formal vote of thanks from the floor, this was seconded by Professor Max Sussman.

The meeting closed at 18.30 hours. □

Date of next meeting:
Wednesday 16 July 2003 at the University of Surrey, Guildford, UK

Caption competition

Those of you who attended the President's Dinner In November 2002 may remember seeing the Editor of *Microbiologist*, Anthony Hilton doing some very strange things with a napkin. Now you have the chance to come up with a suitable caption in 10 words or less to accompany the photograph of this amazing feat! The member who submits the most amusing and original caption will receive a **BOTTLE OF CHAMPAGNE!**

To apply, send your suggestion by email to:
a.c.hilton@aston.ac.uk or pop it in an envelope marked "Napkin Competition" and post it to the Society Office.

Closing date for entries: Friday 25th April 2003

The President's Dinner 2002

Highlights of Peter Silley's address at the President's Dinner in which he raises the very important issues of anti-microbial resistance and bioterrorism and the need for the Society to foster links with the decision makers affecting the future of microbiology today

THE PRESIDENT'S DINNER is a rather informal occasion when we have the opportunity to say thank you to all those people who have supported the Society over the last year, this year is no exception. The Society has clearly been changing over recent years and for that we owe thanks to my recent predecessors. What is clear is that change must continue if we are to stay relevant; we cannot afford to just sit still, we must move forward. Committee have decided that a major focus of activity over the coming years is to raise our profile within the public debate on science policy in the UK. As a Society we have responded to the DoH *"Getting Ahead of the Curve"* report which advocated the formation of the Health Protection Agency but our contribution to this and other debates must be informed. It is only through ongoing contact with bodies such as PHLS that we will be so informed. As a Society I do not believe we have worked hard enough to foster links with the decision makers affecting the future of microbiology. To this end I am hoping that Committee will endorse the setting up of an Advisory Board to the Society which will in some way begin the process of developing those necessary links.

The year so far has been nothing short of interesting. I have attended receptions at the House of Commons and the House of Lords and a dinner at the House of Lords as part of the ongoing collaboration with IoB and the Royal Pharmaceutical Society in considering a response to the challenges of antimicrobial resistance. This subject was explored in a feature article in the last issue of *Microbiologist* entitled *"Pharmageddon Now"* and was a follow up to a meeting in July 2002 in which the Society was a principal sponsor; "Anti-Infectives: The way forward." From that meeting it was identified that the UK must ensure that the recently published UK Antimicrobial Resistance Strategy and Action Plan is actively adopted by all stakeholder departments and agencies.

The Interdepartmental Steering Group, and recently established Expert Advisory Committee on Antimicrobial Resistance, must continue to press for widespread acceptance of the strategy and develop a cross-departmental co-ordinated funding programme, involving charities and industry as appropriate, to stimulate efforts in antibiotic research, facilitate effective long-term surveillance of antibiotic resistance, and to tackle the growth of hospital-acquired infections. Furthermore, to increase funding for academic research focused on development of new therapeutics, provide a more favourable climate for pharmaceutical companies to develop new antibiotics by extending market exclusivity for these beyond the current 20 years from patent registration. In addition, literature and advice is required at school level to encourage pupils to pursue careers in pharmaceutical science and medical microbiology and related professions. Government Departments should liase with learned societies to this end and revise medical and veterinary curricula to reflect the significance of infectious disease and the appropriate use of antibiotics. These are clearly issues in which the Society must play a part.

So what of the future? It is perhaps worth considering events in the US and their potential impact on the UK Science fraternity. In the year since the attacks against the World Trade Centre in New York and the Pentagon, followed closely by the anthrax outbreak, officials in the Bush administration have proposed and implemented new policies to safeguard against further threats to US security. Many microbiologists who will be affected do not yet fully appreciate the full impact of these new rules and are not aware of how they should go about complying with the new requirements. Many of the changes will affect microbiologists as they carry out their professional responsibilities. In particular, some proposals could have an impact in terms of restricting the access of researchers to a wide variety of microorganisms, imposing tighter security standards on laboratories, and on limiting the details of what microbiologists can publish. Proposals for changing agencies that sponsor research and public health investigations could profoundly affect the way in which research priorities are set and how resources are allocated. It would be surprising if a similar situation were not to develop in the UK.

These issues were recently discussed in the American Society for Microbiology *News* and the point was well made in the editorial that, *"In the long term, the only way to defend against bioterrorism is through a combination of constant surveillance, accurate diagnostics to identify threats as early as possible, and continuous innovation to provide high-quality vaccines and drugs that can be useful against any attacks that do occur. Research related to bioterrorism is inextricably linked to that of naturally occurring infectious agents and development of new antibiotics, antivirals, diagnostics, and vaccines."* Cassell, VP at Eli Lilly is seeking to ensure that the new policies and rules that are adopted will be reasonably fair and workable to the many microbiologists whose professional lives those policies and rules will so profoundly affect.

One of the issues facing microbiologists in the aftermath of the deadly anthrax attacks of last year revolves around proposals to restrict publication and other communication rights over research findings from studies involving microbial pathogens that could risk divulging information useful to bioterrorists. Because addressing these issues is not a straightforward undertaking, ASM President Ronald Atlas, asked National Academy of Sciences (NAS) President Bruce Alberts to invite scientific publishers to consider the ramifications of censoring research communications or otherwise suppressing the flow of information within the scientific community. I am sure our friends at Blackwell's will have something to say on these issues. *"The ability to replicate research results is the cornerstone for the ethical publication of scientific research"*, Atlas recently reported in ASM *News*, and expressed a fundamental concern over the prospects of changing scientific publishing practices: *"we do not want to be in a position where we are asked to allow authors to withhold critical information because of concern that significant data could be misappropriated or abused."* A specific concern is that papers published without crucial data will be cited by others, confusing critically reviewed science with science that cannot be reproduced. Requests of this type have serious potential for altering the fundamental tenets of scientific research.

> **We do not want to be in a position where we are asked to allow authors to withhold critical information...**

It is clear that there is much to be done and I trust that this Society will be heard as a relevant authoritative voice in this debate. In many cases this will mean working with others to proclaim a united voice whilst retaining our distinctiveness. We cannot, however, afford to turn our backs on our natural partners. I trust the coming year will see us building bridges and not destroying them.

Peter Silley
Honorary President

Useful contacts

The Society is represented on many scientific bodies and committees which are of interest to microbiologists. Contact details for our these organisations and our representatives to them are given below:

BCCB

British Co-ordinating Committee for Biotechnology
www.biochemistry.bham.ac.uk/stevew/bccb.html
Our representative: **Dr J Coote**

BSI

British Standards Institute
www.bsi-global.com
Technical committees:
AW/9 Microbiology: **Dr S Passmore**
Microbiological Methods:
Dr S Passmore
Chemical Disinfectants & Antiseptics:
Dr S Bloomfield
Disinfectants (National Standards):
Dr S Bloomfield

EFB

European Federation of Biotechnology. www.efbweb.org/
Advanced Genomics research committee: **Dr C Harwood**

FEMS

www.fems-microbiology.org
Our represtative: **Dr P Silley**

FSA

Food Standards Agency
www.foodstandards.gov.uk/
Foodborne disease Strategy Consultative Group: **Dr M Patterson**

IOB

Institute of Biology
http://www.iob.org/
IOB Affiliated Societies Forum::
Dr M Patterson
IOB Environment Committee:
Dr K Jones
IOB Agric. Sciences Committee:
Dr B Seddon
IOB Biomedical Sciences Committee:
Dr M Patterson

MISAC

Microbiology in Schools Advisory Committee. Our representative:
Dr M Adams

SEAC

Spongiform Encephalopathy Advisory Committee.
www.seac.gov.uk
Our representative: **Dr M Patterson**

UKNCC

UK Federation for Culture Collections
http://www.ukncc.co.uk/
Our representative: **Dr P Green**

UKNCM

UK National Committee for Microbiology. www.ukncm.org.uk/
Our representative: **Dr P Silley**

IOB Affiliated Societies Forum

The Institute of Biology, as part of its remit to cover the Biological Sciences has a series of Affiliated Society events. As the Society for Applied Microbiology representative on the Biomedical Sciences panel I attend two meetings per year at the Institute of Biology in London. At these meetings a broad range of relevant issues are discussed and topics selected to be taken forward for Government attention. Two recent issues have been short-term contracts and fighting infection. There are also a series of Affiliated Societies Fora, the most recent one at the end of November 2002, having a distinctly biomedical sciences slant. About 35 representatives from a range of biological societies were present. We were welcomed by Dr. Nancy Lane, President of the IOB and updated on various Institute initiatives including the introduction of a Continuing Professional Development scheme and progress towards a Biosciences Federation for the UK. The main business of the meeting were presentations by three distinguished speakers. The first was from Dr. Sandy Thomas describing the work of the Nuffield Council for Bioethics which considers ethical questions raised by advances in biology and medicine using either discussion papers or reports, depending on the urgency for a response. Discussion papers give a rapid response and have been used for consideration of stem cell research and DNA patenting. Issues where a longer time scale is available are addressed by reports which take about two years to prepare and have mainly been concerned with human genetics. The next presentation was by Lord Soulsby of Swaffham Prior who outlined the Select Committee process and how it differs between those in the House of Lords and the House of Commons. The topics of current consultations are Bioterrorism in the House of Commons and Fighting Infection in the House of Lords. The Society reported on this initiative in the feature *"Pharmageddon Now"* in the December issue of *Microbiologist*. The final presentation was by Sir George Radda, Chief Executive of the Medical Research Council who spoke about the multidisciplinary approach needed for scientific research in the future. He also showed some video clips illustrating the role of collaborative research that had allowed us to follow the development of a specific tissue in the embryo. During the course of the day there were several opportunities to talk to other society representatives which made it a very useful and interesting day.

Joint initiatives

Representatives from SfAM and SGM met recently to explore joint activities that might be undertaken by the two Societies. A principle has been established that any joint activities must be mutually beneficial and complementary to both Societies and be a benefit to UK microbiology as a whole. One idea is "Microbiology in the Regions". where both Societies would jointly sponsor meetings aimed at promoting microbiology at regional level to members and to the wider community. Two types of meeting were considered. Firstly, the format of a one-day scientific meeting on a particular topic where the two Societies would cover the costs and could also offer a prize for the best presentation by a young scientist at the event. Secondly, inclusive rather than exclusive regional group meetings to bring together senior academics, students, local equipment manufacturers, EHOs, hospital staff and local industry etc., comprising short presentations on who is doing what and the equipment available with the aim of encouraging collaboration, sharing of resources and training. These ideas are still in development but updates will be posted on the website when they become available.

We are looking for more ideas and comments from members and welcome your suggestions for other joint, complementary initiatives. Please send your comments and suggestions to me at: margaret.patterson@dardni.gov.uk

Margaret Patterson
Honorary General Secretary

Reception at the House of Lords

It is not often that one is invited to the House of Lords, but as the Society for Applied Microbiology representative for the Affiliated Societies of the Institute of Biology, I had that privilege in October.

The occasion was a reception hosted by Lord Soulsby of Swaffham Prior to mark the launch of the "policy alert" with the wonderful title of *"Pharmageddon Now"*.

The instructions were to enter the Houses of Parliament through Black Rod's Garden Entrance where we had to present our invitation and letter of confirmation. We were then directed along various passageways until we came to our destination, the Cholmondely Room and Terrace. At the entrance we went through airport style security checks and then to the cloakrooms where a lady took our coats and bags. We then proceeded to the reception room where we were offered drinks - white or red wine, orange juice or tomato juice and then onward to the terrace. The terrace is fully enclosed and heated and looks out over the River Thames. (You can see these terraces if you walk beside the River under St. Thomas's Hospital. The serious business of the evening then began with speeches from Lord Soulsby, Dr. Nancy Lane (President of the Institute of Biology), Mr. Marshall (President of the Royal Pharmaceutical Society of Great Britain), and Dr. Gibson (Chair of the Parliamentary and Scientific Committee). After that we were free to circulate and talk with other guests. The guests included members of the House of Lords, people from other Government Departments, reporters from scientific journals and representatives from learned societies and the pharmaceutical industry. This was a very interesting evening and we look forward to an effective outcome from this policy alert and its associated papers.

Hilary Dodson
Committee Member

The European Federation of Biotechnology

The European Federation of Biotechnology (EFB) was founded in 1978 to serve the interests of academic and industrial biotechnologists throughout Europe. EFB aims to advance the use of cutting edge research in biotechnology, to provide and inter-disciplinary/ national forum to improve education and to facilitate informed dialogue between scientists and the public.

Re-launch of EFB

The approval of new EFB statutes during the General Assembly held in Madrid in August 2001 immediately before the 10th European Congress of Biotechnology marked the launch of a rejuvenated Federation. These statutes include provision for the election of equal numbers of representatives from industry and academia on the new EFB Executive Board (ExBo); individual and institutional membership of the Federation; the levy of a fee of up to €1,000 a year from institutional members; and the completion of the conversion of the former closed Working Parties into Sections open to membership by anyone interested in becoming an active EFB member.

Activities of the EFB Secretariat and Executive Board

Two ExBo meetings have been held, in Frankfurt in October 2001 and in Brussels in June2002. More notable, however, has been the intense activity of a Core Group who, under the leadership of first Pierre Crooy and more recently Børge Diderichsen, have instigated a diverse and vigorous programme of new activities. Administrative support is provided by the EFB Secretariat at DECHEMA under the leadership of Rudy Marquart. Visit the website at http://www.efbweb.org for full details of current activities and what has been achieved in a relatively short period. There is a comprehensive calendar of forthcoming EFB events, details of how individuals can register on-line for free membership, links to EFB Sections (Biochemical Engineering Science; Microbial Physiology; Applied Functional Genomics; Agri-Biotechnology; Applied Biocatalysis; Environmental Biotechnology; Biodiversity; Pharma Medical Biotechnology) and Task Groups (Public Perceptions of Biotechnology; Education; Safety in Biotechnology; International Relations; Innovation); and links to web pages and on-line registration forms for forthcoming events. The latter includes Congresses, Symposia, international initiatives such as the EFB in China, and related activities by the Task Group for International Relations.

Membership of EFB

EFB is now keen to enlist your support, either as registered personal members for whom no annual fee is charged, or better still as an institutional member. Institutional membership fees provide a steady income stream into the Central Fund, thereby addressing the fundamental weakness that limited the effectiveness of EFB in the past. EFB currently has 2190 personal and 149 institutional (76 learned societies, 40 companies and 33 research institutes/ universities) members. The Society for General Microbiology and The Society of Chemical Industry are both full members while the British Coordinating Committee for Biotechnology has paid a membership fee to represent The Institute of Chemical

Engineers, The Society for Applied Microbiology, and the Biochemical Society. Universities, research institutes and industrial companies in the UK are now encouraged to join this rapidly expanding Federation.

Recent events under the aegis of the EFB

The 10th European Congress of Biotechnology held in Madrid last August, attended by about 1200 people, was marked by excellent scientific presentations and highly professional organisation. ECB11 will be held in Basle in August 2003. The most recent European Congress of Biochemical Engineering Science in Delft in September 2002 was also well attended. Various specialist meetings and short courses have enhanced both the profile of the Federation, and links with other Federations. For example, FEMS have provided scholarships for young scientists to participate in four if the last five meetings of the Microbial Physiology Section. In return, the Section has provided high quality contributions to the new Journal, FEMS Yeast Research, and will organise two symposia at the 1st FEMS European Congress of Microbiology to be held in Lubljana in June 2003.

Colin Harwood
Hon Editor: *Letters in Applied Microbiology*

Further information:

This can be obtained from the UK members of the ExBo who are Jeff Cole, Colin Harwood and Charles Bryce

j.a.cole@bham.ac.uk
colin.harwood@ncl.ac.uk
c.bryce@napier.ac.uk.

Endangered Culture Collection Fund

Culture collections throughout the world help preserve and maintain the working tools of our trade as practising microbiologists. In many counties these precious biological resources are becoming endangered and are being lost to the scientific community. Working with the World Federation of Culture Collections (WFCC), the Society has taken the initiative in launching ***The Endangered Culture Collection Fund.*** This is a new fund created by ***sfam*** in response to a request by the World Federation of Culture Collections (WFCC) to help to aid world culture collections whose existence is under threat. As practicing microbiologists most of us are aware of the value of national culture collections as sources of authenticated reference material and whose job it is to preserve, maintain and supply such materials to those who wish to access this archived genetic resource. In most "developed" countries the majority of national collections are supported either directly or indirectly to varying degrees by government. But in less developed counties culture collections very often have no means of direct support or have access to only very scant and unreliable support. Today, several important culture collections are being lost each year throughout the world, not to mention the very many not registered with the WFCC who may represent the life work of one or more eminent scientists. Very often these collections contain unique strains which could have properties of real value to modern society.

The endangered culture collection sub-committee of the WFCC exists to help such collections, but have so far been frustrated in their efforts since they are limited to providing verbal and non-financial assistance. The Society's new ***Endangered Culture Collection Fund*** will allow a more tangible form of assistance and will greatly increase the scope of this sub-committee to assist endangered collections. For example, it will allow for the purchase of essential, basic, preservation equipment and/or consumables and short term technical assistance to give such collections breathing space to affect a more lasting solution. The Fund may also assist with the removal of an endangered collection to a safe haven if this is the only option. A grant of up to £2500 may not seem like much in the way of financial help but in countries where monthly salaries can be as low as US$10.00 such a grant could provide technical input and provide essential consumables for several years.

The WFCC is extremely indebted to ***sfam*** for taking a lead in its support of global genetic resources. Applications to the Fund are open to all those who satisfy the eligibility, criteria details of which are available from the Society Office.

Peter Green
Committee Member

The *sfam* Endangered Culture Collection Fund

Purpose

1. To allow UK collection staff to visit endangered collections and provide training and advice aimed at preserving culture collections either *in situ* or within the country of origin.

2. To provide short term relief in terms of technician's salary costs, basic consumables and/or equipment.

3. To pay for the relocation of collections to a willing recipient where collections cannot be maintained *in situ*.

Guidelines

1. Annual awards totalling £2500 will be considered. This may be a single award or multiple smaller awards. In exceptional circumstances this amount may be exceeded.

2. Applicants must have been members of the Society for at least 3 years or have their application sponsored by such a member.

3. Applicants should request a formal application form or from the Society Office. All applications should also be supported by a formal letter on headed paper from the appropriate institution and must be countersigned by a senior officer representing that organisation and supporting the application.

4. Applications are considered on a year round basis and should in the first instance be addressed to the Hon. General Secretary at the Society Office.

5. A condition of funding is that an appropriate report must be produced for publication in The *Microbiologist.*

Further information:

- Postal applications to the fund. Please apply to the Society Office - address on page 5.
- Online applications. A form will be available shortly on the Society website.

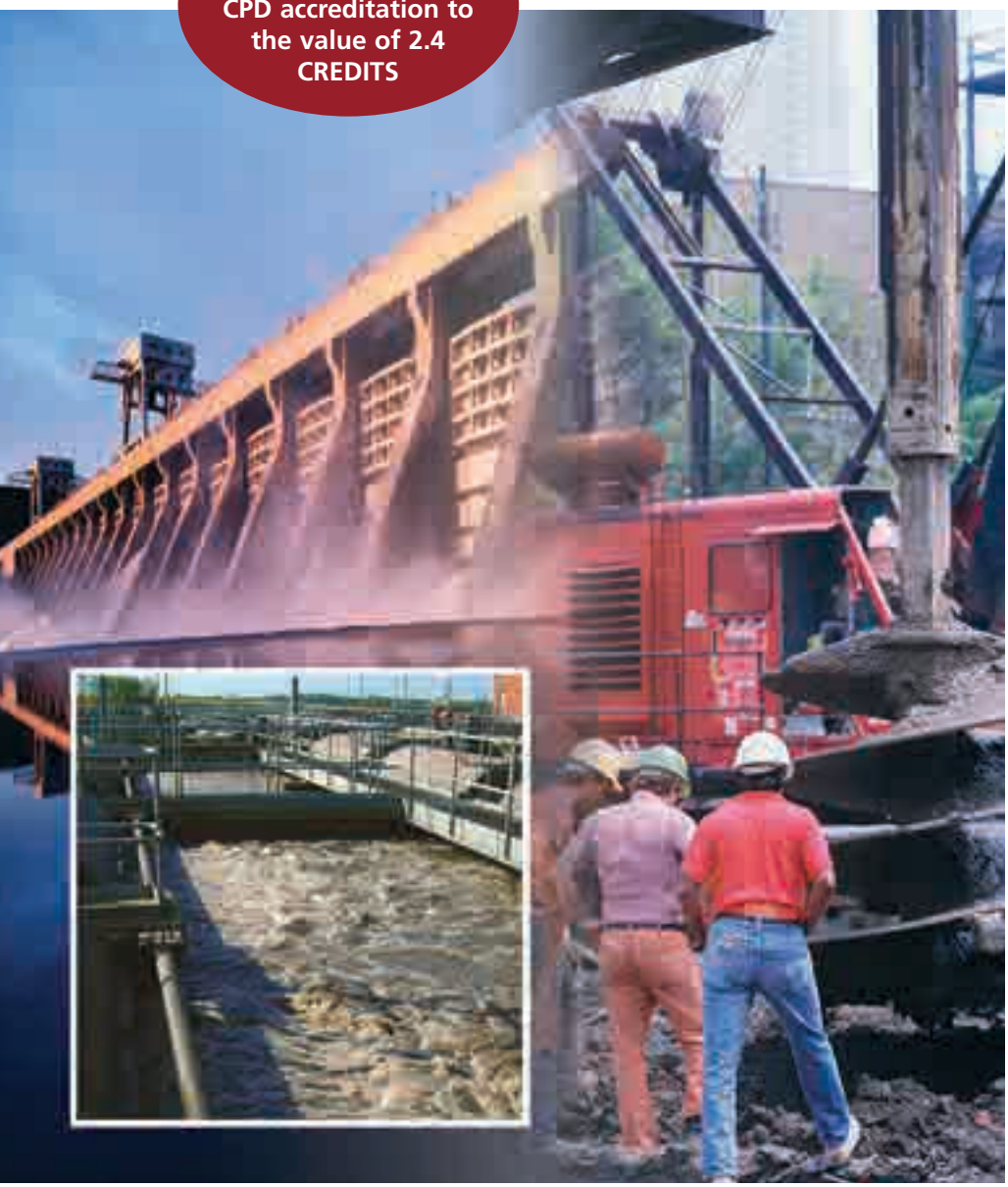
This conference will help microbiologists appreciate the very significant contribution they can make to modern engineering practices

MICROBIOLOGY of ENGINEERED ENVIRONMENTS

Incorporating 2nd International Congress on Microbiology in Civil Engineering

University of Surrey, Guildford, UK ● 14 - 17 July 2003

This Meeting has been awarded CPD accreditation to the value of 2.4 CREDITS



BOOK NOW!

There is a Booking form for this meeting on page 23. The last day for registrations is **Friday 13 June 2003.**

THE 2003 SUMMER CONFERENCE will be held 14th - 17th July, 2003 at the University of Surrey, Guildford. This is intended to present an opportunity for cross-disciplinary dialogue between microbiologists and engineers of all persuasions. Both disciplines have had major impacts on public health and this will form the focus of an opening debate at the first evening mixer. Speakers who have already agreed to give invited papers include international experts covering the whole range of topics, both academics and those actively engaged in engineering projects and processes. The conference will attract a wide-ranging audience demonstrating just how important microbes and their activities can be in almost all engineered environments and help microbiologists appreciate the very significant contribution they can make to modern engineering practices.

STUDENTS!

The Society offers Studentships to enable **student members** to attend Society meetings. These grants cover registration, accommodation, meals (where appropriate) and modest travel expenses. To apply, please complete the form on page 24.

Programme

This programme was up to date at the time of publication but some speakers have not yet been confirmed. For the latest information and an online booking form please visit the Society website at www.sfam.org.uk

Monday 14th July 2003

Registration: From 1400 hrs

Evening Debate:

"Modern public health: a result of practical engineering or microbiological science?"

For the Microbes:
Dr John Lee, Head PHLS Water & Environmental Microbiology Research Unit, Central Public Health Laboratory, 61 Colindale Avenue, London, NW9 5HT.

For the Engineers:
Professor Sandy Cairncross

Chairman:
Professor Duncan Stewart-Tull

Tuesday 15th July 2003

Introductory overview

09.00 - 09.40 Biofilms and consortia: central themes in engineered systems.
Hilary Lappin-Scott, Professor of Environmental Microbiology, Department of Biological Sciences, University of Exeter, Exeter, Devon EX4 4PS, UK

Microbiology of Wastes, Landfill and Remediation

09.40 - 10.20 Waste stabilisation ponds: their application in the UK and World-wide
Dr Tom Curtis, School of Civil Engineering and Geosciences, University of Newcastle, Newcastle-upon-Tyne, NE1 7RU.

10.20 - 10.50 Coffee and poster session

10.50 - 11.30 Permeable reactive barriers in remediation.
Prof. Robert Kalin, Questor Unit, Department of Civil Engineering, University of Belfast, Belfast, N. Ireland

11.30 - 12.10 Membrane bioreactors for waste and leachate remediation
Simon Judd, Reader in Water Sciences, Cranfield University, Cranfield, Bedfordshire, MK43 0AL

12.10 - 12.50 Offered papers

12.50 - 14.00 Lunch and poster session
(Authors present from 1330 - 1400)

14.00 - 14.45 Natural attenuation and bioremediation of oil-contaminated sites.
Dr Gordon Lethbridge, Shell Global Solutions (UK), Cheshire Innovation Park, P.O.Box 1, Chester, Cheshire, CH1 3SH, UK

14.45 - 15.30 Phytobial remediation: exploitation of modified rhizospheres
James M. Lynch, Professor of Biotechnology, School of Biomedical and Life Sciences, University of Surrey, Guildford, Surrey, GU2 7XH, UK & G.E.Harman, University of Cornell, USA

15.00 - 15.30 Tea and poster session

16.00 - 16.40 Policy and regulatory aspects of soil and groundwater bioremediation
Alwyn Hart, National Groundwater and Contaminated Land Centre, Environmental Agency, Olton Court, 10 Warwick Road, Solihull, West Midlands, B92 7XH, UK

16.40 - 17.20 Microbial metal winning, bacterial mining and reclamation of metals
Martin Hughes, Department of Chemistry, King's College, University of London.

Call for papers

During the conference there will be ample opportunity to present offered papers and posters within a relevant subject area, as well as a session for student oral paper and poster presentations. We will be pleased to receive ideas for offered papers and posters in relevant subjects areas.

Abstracts should not exceed 500 words and the contents should include the aims and objectives of the work, brief methodology, results, conclusions, and implications for the work. Please indicate whether you would prefer a poster or oral presentation.

Abstracts should ONLY be sent by email to the Society Office with the subject line "Summer conference submission" and marked for the attention of Lynne Boshier.

email: lynne@sfam.org.uk

The closing date for submissions is Friday 9 May 2003

Programme

Wednesday 16th July 2003

Water and Wastewater Processing

09.00 - 09.45 Engineering design to eliminate microbial/ biological problems in water mains
Prof Richard van der Kooij and Dr Jan Vreeburg, KIWA Water Research, Groningenhaven 7, Postbus 1072, 3430 Nieuwegein, The Netherlands.

09.45 - 10.30 Polyaromatic hydrocarbon mobilisation by biofilms in water distribution systems
Dr Matthias Maier, Stadtwerke Karlsruhe, Daxlander Strasse 72, 76127 Karlsruhe, Germany

10.30 - 11.00 Coffee and poster session

11.00 - 11.30 Novel disinfection systems; free radicals to high frequency pulses
Dr David Holt, Research and Development, Thames Water Utilities, Spencer House, Manor Farm Road, Reading, RG2 0HP

11.30 - 12.00 Design and operation of activated sludge plants to optimise biological phosphorus removal
Peter Pearce and Stephen Williams, Thames Water Utilities, Spencer House, Manor Farm Road, Reading, RG2 0JN, UK

12.00 - 13.00 Student oral presentations

13.00 - 14.00 Lunch and poster session
(Authors present from13.30-1400)

Buildings and the Construction Industries

14.00 - 14.45 Commissioning, balancing and microbiological problems in buildings' water services
Elizabeth Day, 6 Chapel Lane, Westcott, RH4 3PJ, UK

14.45 - 15.30 *Pseudomonas* and other microbial problems in buildings' water services
Janice Calvert, Oakland Calvert Consultants Ltd, Unit 20, Greenwich Centre business Park, Norman Road, London, SE10 9QF.

15.30 - 16.00 Tea and poster session

1600-1645 Cooling towers: *Legionella* and litigation.
Mark Iddon, Water Management Society, Mill House, Tolson's Mill, Fazeley, Tamworth, Staffs, B78 3QB.

16.45 - 17.45 W.H.Pierce Memorial Prize Lecture

17.45 - 18.30 Annual General Meeting

20.00 Society Dinner

Thursday 17th July 2003

Buildings and the Construction Industries continued

09.00 - 09.45 Wooden constructions: what happens now all the biocides are banned?
Janice Carey, Building Research Establishment, Bucknalls Lane, Garston, Watford, WD25 9XX, UK

09.45 - 10.30 Microbial interactions with structural stone and concrete.
Thomas Warscheid, MPA-Bremen, Bremen, Germany

10.30 - 11.00 Coffee and poster session

11.00 - 11.40 Microbial problems in tunnels and groundworks
Stefan Jefferis, Professor of Civil Engineering, Geotechnical Consultancy Group, London, UK

11.40 - 12.20 Allergenic fungi in buildings and air-conditioning systems
Speaker to be confirmed

12.20 - 13.00 Toxigenic moulds in buildings
Maurice Moss, British Mycological Society, 18 Dagden Road, Guildford, Surrey, GU4 8DD, UK

End of Conference

Student Essay competition

To complement the theme of this year's summer conference on **"Microbiology of Engineered Environments"** the Society is once again running a Student Essay Competition. The essay should be entitled ***"Who should manage bioremediation, microbiologists or engineers?"*** Entries should be word-processed, no longer than 1500 words and submitted to the Society office **no later than Friday 18th April 2003**. The entries will be judged by a panel of experts, including some of the key speakers. The winning essay will be published in ***Microbiologist'*** and the author will receive a certificate and £50 prize.

BOOKING FORM and INVOICE

Summer Conference 14 - 17 July 2003

'Microbiology of Engineered Environments'

Only ONE person per form please. If additional forms are required please photocopy this one

CLOSING DATE FOR REGISTRATIONS

Friday 13 June 2003. A LATE BOOKING FEE of £30.00 will operate after this date. **NO REFUNDS will be given after Friday 13 June 2003**

FEES

	Full Members	Student, Honorary & Retired Members	Student Non-Members	Non - Members
Whole Conference Rate: inclusive of registration fee, coffee breaks, lunch, dinners, Society dinner and accommodation for the entire Conference.	£300.00	£150.00	£300.00	£500.00
Day Rate: 08.30 - 17.00 hrs per day or part thereof - inclusive of registration fee, coffee, lunch and tea)	£75.00	£40.00	£75.00	£150.00

Member of the Institute of Civil Engineers Fees: (Please enter your ICE membership number below)	Whole Conference Rate	Day Rate
	£400.00	£120.00

Overnight Accommodation. En-suite room per night inclusive of breakfast and dinner.	
Monday or Tuesday night:	£65.00
Wednesday night inclusive of Society Dinner:	£90.00

☐ **I am a member of ICE and my membership number is:** _____

YOUR COSTS

Charges - please tick the applicable box(es)	Mon	Tues	Wed	Thur	Total Amount
☐ **Whole Conference Rate** (This includes accommodation, meals and the Society Dinner for the entire Conference):					£
☐ **Day Rate** (please tick the DAYS you wish to attend):	☐	☐	☐	☐	£
☐ ***Overnight Accomodation** (please tick the NIGHTS you wish to stay):	☐	☐	☐		£
☐ **I wish to attend the Society Dinner on Wednesday evening (This costs £30.00).**					£
☐ **LATE BOOKING FEE** (Payable after 13 June 2003): *If you book accommodation on Wednesday night the cost of the Society Dinner is included in your accommodation charge.					£30.00
TOTAL AMOUNT REMITTED:					£

Please indicate any special dietary or other requirements (such as disabled access): _____

YOUR DETAILS

Title:_____ **Family Name:**_____ **First Name:**_____

Address:_____

_____ **Postcode:**_____

Tel No:_____ **Fax No:**_____ **Email:**_____

YOUR PAYMENT

● **For all participants: The Society DOES NOT INVOICE for conference fees. Please treat your completed booking form as an invoice. Cheques must be in £ STERLING ONLY and made payable to 'The Society for Applied Microbiology'. Foreign cheques/ drafts MUST be negotiable for the full amount due. Please note that AMERICAN EXPRESS and DINERS CARDS are NOT ACCEPTED.** However the following credit and debit cards are acceptable: VISA, Mastercard, Eurocard, Delta, Electron, JCB, Maestro and Solo.

☐ **Cheque enclosed** ☐ **Please charge my *Mastercard/Visa card /Debit card*** *(please delete inapplicable items)*

TOTAL Amount enclosed/ to be debited: (*Please remember to include your LATE BOOKING FEE if your are booking after 13 June 2003) £_____

Card number: ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ Expiry Date: ☐☐☐☐

Signature: _____ *Date:_____ Issue No. ☐☐☐ *(Debit cards only)*

Cardholder's address to which credit card statement is sent:_____

_____

Please return the completed form by fax (post if you are enclosing a cheque) to: **The Society for Applied Microbiology, The Blore Tower, The Harpur Centre, Bedford MK40 1TQ, UK. Tel: 01234 326661. Fax: 01234 326678. Email: meetings@sfam.org.uk**

SUGGESTION: please photocopy this form to save mutilating your copy of the Microbiologist!

STUDENTSHIP Application

Summer Conference 14 - 17 July 2003

'Microbiology of Engineered Environments'

Only ONE student per form please. If additional forms are required please photocopy this one

SUGGESTION: please photocopy this form to save mutilating your copy of the Microbiologist!

About this award

The Society offers Studentships to enable **student members** to attend Society meetings. These grants cover registration, accommodation, meals (where appropriate) and modest travel expenses. Preference is given to students contributing to the meeting either by offering a paper or poster and who have not previously received a this award. To be considered for a Studentship grant, please complete this form in **BLOCK CAPITALS** and return it to the Society Office **no later than Friday 2 May 2003.**

YOUR DETAILS

Title:_____ **Family Name:**_____ **First Name:**_____

Address:_____

_____ **Postcode:**_____

Tel No:_____ **Fax No:**_____ **Email:**_____

University or College:_____

Your Department:_____ **Position in Department:**_____

Grant authority:_____

Your intended career:_____

YOUR COSTS

Expected Travel Costs:_____

Other costs - please specify:_____

_____

_____

Why do you wish to attend this meeting?

Please give your reasons:_____

_____

_____

Your signature:_____ **Date:**_____

(If you need more space for your answer please continue on a separate sheet)

Will you be contributing to the meeting by offering a Poster or presenting a paper? ☐ **Offering a Poster** ☐ **Presenting a Paper**

YOUR SUPERVISOR'S SUPPORT

This section **MUST** be completed by your Supervisior or Tutor. Applications which are not supported by your Supervisor will be automatically rejected. **Please give your reasons why the applicant should receive a studentship:**

_____

_____

_____

Supervisor's name:_____ **Tel and extension:**_____

Supervisor's signature:_____ **Position:**_____ **Date:**_____

(If you need more space for your answer please continue on a separate sheet)

In signing this application I agree to reimburse the Society for any costs it may incur in awarding this grant should the applicant fail to attend the conference or fail to notify the Society of their inability to attend the conference within 28 days of the start of the meeting.

Please confirm your agreement by ticking the appropriate box: ☐ **I agree** ☐ **I do not agree**

Please return your completed application by fax or post to: **The Society for Applied Microbiology,**
The Blore Tower, The Harpur Centre, Bedford MK40 1TQ, UK. Tel: 01234 326661. Fax: 01234 326678. Email: meetings@sfam.org.uk

http://www.umweltbundesamt.de/water-safety

Berlin, 28 – 30 April 2003

WaterSafety

Risk Management Strategies for Drinking water

HACCP-based principles in drinking water: The Water Safety Plans of the WHO

The current revision of the WHO Guidelines for Drinking-water Quality aims to supplement drinking-water „product control" with risk assessment and quality management strategies focussing on „process control". This approach is called „Water Safety Plan". It includes elements of HACCP (Hazard Analysis and Critical Control Points), widely and successfully used in food industry.

In some countries this new development is already being implemented in the drinking-water supply chain from catchment to consumer, both in regulatory frameworks and upon initiative of individual water suppliers. Sector discussion of these concepts and of experiences with their implementation is needed.

The international conference in Berlin aims to promote the understanding of currently available approaches to risk management, particularly of approaches using elements of HACCP. A further aim is the exchange of current experience with this approach in relation to other quality management systems applied to secure drinking-water safety.

From presentations given by experts selected among practitioners in water supply and public health you will learn about:

- Drinking-water targets for public health
- Water Safety Plans: the WHO approach
- Water suppliers' experience with HACCP principles in catchments, in treatment and in distribution
- Application of Water Safety Plans to small and medium-sized supplies
- Integrating HACCP-principles into current quality management systems in drinking-water
- Applicability of Water Safety Plans for managing chemical risks
- Perspectives of regulation and surveillance authorities

Your experience and your assessment of these approaches is in demand. Thus, extended „Coffee Workshops" for discussion in smaller working groups including the speakers will take place daily. Participants are invited to contribute their experiences with short (3-5 minute) presentations as well as to discuss their judgement of these developments, particularly with respect to their relevance and applicability in the settings represented by the participants. The feed-back and the exchange of ideas developed in these Coffee Workshops will be recorded by rapporteurs and presented at the concluding plenary discussion.

Participants will receive a free copy of the WHO document on Water Safety Plans.

Conference languages will be English and German. Simultaneous translation will be provided.

In collaboration with:

WHO

IWA

DVGW

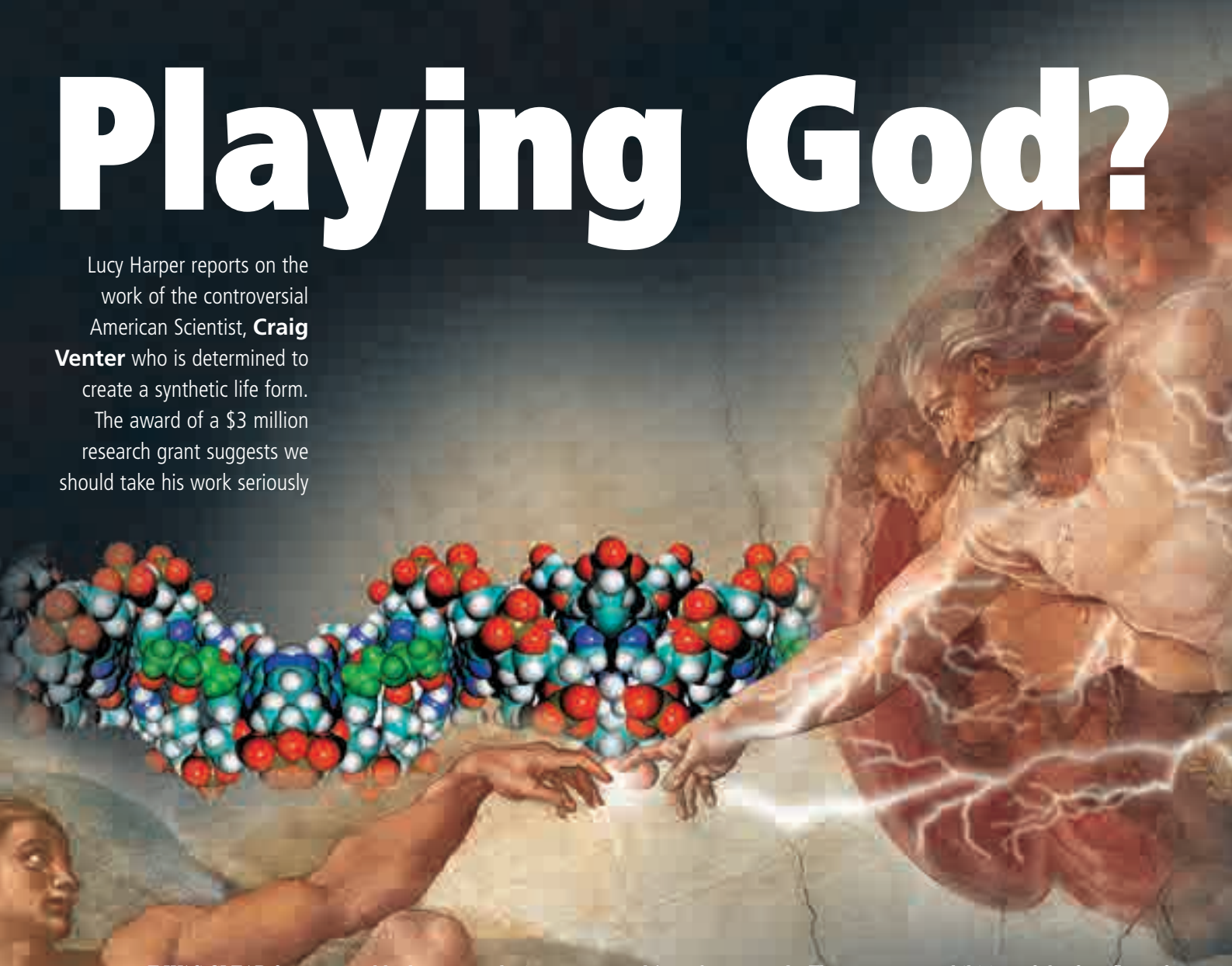
unicef

Federal Environmental Agency
Section II 4.3
PO Box 33 00 22
14191 Berlin, Germany
Contact: Mr Michael Frobel
email: water.safety@uba.de
www.umweltbundesamt.de/water-safety
phone: +49 (30) 8903 1415, fax: +49 (30) 8903 1800

Umwelt Bundes Amt

Playing God?

Lucy Harper reports on the work of the controversial American Scientist, **Craig Venter** who is determined to create a synthetic life form. The award of a $3 million research grant suggests we should take his work seriously



IT WAS CLEAR from an early age that Craig Venter had a rebellious streak. Former leader of Celara Genomics Inc. - the commercial 'opposition' to the publicly funded International Human Genome Mapping Consortium (IHGMC), he has now decided to take the knowledge gained (and financial reward he obtained by refusing to publish his human genome data in the public database, GenBank) to new heights. He now aims to 'create a new life form'. This may make him appear God-like and his renegade qualities and reputation for profiteering would suggest that he believes he is a law unto himself. But the nature of his next project appears at first glance to contradict this attitude. He is proposing to use the sequence of bacterial genes to create an entirely new life form, and enhance the CO_2-sequestering and hydrogen-producing properties of bacteria, in an attempt to create a clean energy source!

Born in 1946 in Salt Lake City, Venter left an unremarkable High School life, where he'd been unmotivated and directionless not for academia, but for the beaches of California, where he'd developed a passion for surfing. This enthusiasm for the waves may have been why he volunteered as a Navy medical corpsman in Da Nang during the Vietnam War. Here he was *"taught lessons about the fragility of human life and the colossal ineptitude of big bureaucracies."* His rebellious nature was to manifest itself when he spent two stints in the brig for refusing to follow orders. However, his attitude to education had changed: *"When I started learning and practicing medicine in Vietnam, I couldn't learn things fast enough. The more you knew, the more people you could help."* On his return to the USA he enrolled at the University of California where he attained a PhD in Physiology and Pharmacology.

He moved to the National Institute of Health (NIH) in 1984 where he worked on a project to localise and sequence the gene coding for the human brain α-adrenergic receptor. His dedication to work was demonstrated when he purchased an automated sequencer out of his own pocket when his NIH bosses refused to buy it for him. While at the NIH he used Expressed Sequence Tag (EST) methodology (of which some claim he was the founder) to identify 25 sequences per day and in doing so discovered 3,500 new human genes. In 1991 the NIH filed for patents on these genes which some may think would result in the relative prohibition of the free flow of scientific information - but the US Patents and Trademarks Office didn't agree. This was to be the first example of significant financial gain from a scientific discovery that would become a Venter trademark. In 1992 Venter left the NIH because he didn't agree with the bureaucracy. He went on to use the $70million, 10year research grant given to him by a venture capitalist firm for his elucidation of the aforementioned genes, to set up the Institute for Genome Research (TIGR). In 1994 Venter teamed up with Hamilton Smith - former Nobel prize co-winner for the joint discovery of restriction enzymes - to shotgun sequence the first prokaryotic genome, that of *Haemophilus influenzae*. In order to support this work Venter and Smith had no choice but to *"dip into TIGR funds when*

there was very little there." It took them just a year to sequence the *H. influenzae* genome which, with just over 1,000 genes is relatively small. As a testament to the grievances between Venter and NIH, a grant proposal which Venter and Smith had applied for to perform this work was rejected just a month before its completion.

Venter's interest in genome sequencing had been awakened and in 1998 he gave up directorship of TIGR to his wife and collaborator Claire Fraser. He and Perkin Elmer (now Applera) formed 'Celera Genomics' a company which would use shotgun sequencing to sequence the entire human genome. At around the same time the publicly funded Human Genome Project (HGP) headed by Francis Collins, was funding numerous research centres worldwide to use the clone-by-clone technique to sequence the human genome. This group of institutions would form the International Human Genome Mapping Consortium (IHGMC)

Venter believed his technique would allow the human genome to be sequenced in a fraction of the time it would take the IHGMC - but what is shotgun sequencing? This technique involves fragmenting an organisms DNA, sequencing each of the tiny fragments, and reassembling the sequences in the correct order using computational technology. The clone-by-clone technique on the other hand is a much more laborious procedure in which an organisms DNA is fragmented and inserted into bacteria, creating bacterial artificial chromosomes (BACs). The DNA segments are replicated as the bacteria themselves replicate and each of a set of overlapping segments is sequenced in order to reconstruct the sequence of the whole chromosome. This would produce virtually an entire genome sequence in which any sequence gaps would be closed, compared to Celera's draft sequence which would have to be returned to and the gaps filled in at a later date. In the end the HGP couldn't stand the pressure and resorted to copying Venter's shot-gun sequencing technique in a bid to save time. Was this shortcutting on the part of the IHGMC? Whether it was or not, both parties finished their sequences at about the same time and the first analyses of this sequence data were published in Feb 2001 (Morgan *et al.*, 2001; Venter *et. al.*, 2001). Both party's findings confirm that the human genome has between 35,000 - 45,000 genes, considerably more than *H. Influenzae*.

This data were merely the initial 'working draft' of the human genome sequence and it will be some time before all the gaps have been filled in, however at the Cold Spring Harbor Genome Meetings in the USA scientists are running a sweepstake as to the number of genes the human genome actually contains. So far they have had 165 bets ranging from 27,462 to 153,478, with the money being on 61,710 genes.

The implications of the elucidation of the human genome are vast and wide-ranging. They include the relation of genetic information to a myriad of diseases with subsequent consequences for their treatment, and the comparison of the human genome with that of other organisms allowing scientists to gain a deeper insight into evolutionary patterns. Until the human genome was sequenced, scientists had been studying genetics, i.e. the study of structure and function of one particular gene, but now they have the capacity to study genomics, investigating how huge numbers of genes act in relation to one another.

Upon publication of the human genome sequence data, a public slanging match began between the IHGMC and their commercial 'opposition'.

Venter made his position clear: *"Fundamentally, the public genome program was so vested in its own methodology, in its own funding bureaucracy, that it didn't want to entertain new ideas. That isn't how science should proceed."* However, members of the IHGMC note that HGP officials were continuously looking for new technologies which would allow them to complete the project as quickly and inexpensively as possible. The clone-by-clone versus shotgun sequencing row continues with some workers from the IHGMC arguing that Venter could not have achieved his results without their contribution, and that his results were not actually an independent sequence of the human genome at all (Waterston *et al.*, 2002). Venter's response to this paper was to claim that HGP scientists were using statistics to *"lie and fool the scientific community... It's disturbing how few independent voices there are in science. People are so afraid of offending their possible funding sources that mis-stated facts in science don't get challenged anymore."*

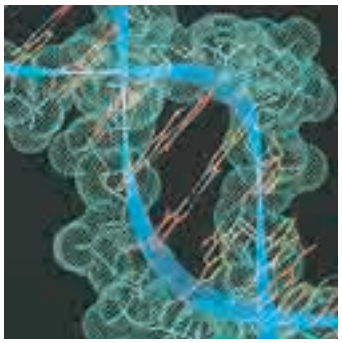
However, the fact that Celera would not make their sequence data available to the public by placing it on the GenBank database cannot be ignored. This data is available through Celera directly or via their website, however there are pre-conditions in place for commercial users, and even academic researchers have to make numerous legal and financial agreements with Celera before they can access their data. This makes the data selectively available unlike the HGP data which are freely available to all. I attempted to access the data from the Celera website (www.celera.com) and found that to access the human genome sequence and use the tools available to analyse this data would cost me a minimum of approximately $7,000 for a three year subscription! This is hardly conducive to the free flow of scientific information. But then again, if Celera hadn't suggested using shotgun sequencing, and the HGP hadn't followed their example the data might not yet have been available at all. Venter also points out that it is not the raw base-by-base data that has any real value, but the computational tools which Celera developed in order to interpret the data that make this information so valuable.

Venter left Celera in January 2002 due to reasons which tie in with his nonconformist nature - differences between himself and management of Applera about the direction of Celera. The commercialisation of the sequencing of the human genome was highly profitable and when Venter left the company it was generating $130-150 million per year in revenues.

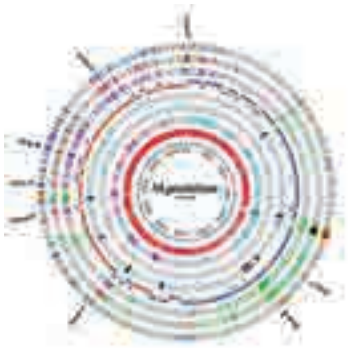
With an apparent change of attitude, Venter is now putting his efforts into three non-profit organisations which he has set up:

1. The Centre for the Advancement of Genomics (TCAG). This organisation (with a clever acronym) will be a centre for the advancement of science through education. It will support the Nondiscrimination in Health Insurance & Employment Act currently under consideration in Congress, and among other ventures will promote stem cell research.

2. The Institute for Biological Energy Alternatives (IBEA). This will seek



biological answers to global warming. The idea for the institute came after Venter *et al* completed the sequence of the first Archean *Methanococcus jannaschii* - an autotroph which uses CO_2 as its primary source of carbon and produces methane through its metabolism. This has obvious environmental implications in potentially absorbing excess CO_2 from the atmosphere. Another organism with potentially environmentally friendly properties metabolises methane and produces hydrogen. Venter believes it could be genetically 'altered' to drive fuel cells and other clean-energy applications. Together with Hamilton Smith, he will investigate the implications of their discovery of the minimum number of genes required to sustain the life of *Mycoplasma genitalium*. This organism, which inhabits the genito-urinary tract wall, has a total genome size of 578kb and is



home to 517 genes and as such it is the free-living organism with the smallest known genome. Venter and Smith found that in order for *M. genitalium* to remain alive, merely 265 - 350 of its genes are required, of which as many as 1/3 have unknown function (Hutchison *et al.*, 1999). At the end of last year the IBEA announced that it had been awarded a $3million grant from the Office of Science Department of Energy to fund the project whose aim is to create a synthetic life form by getting rid of all its 'unnecessary' genes. There are obvious ethical implications involved in the creation of a 'new' life form.

Were Venter and Smith successful, they may ultimately have the knowledge and technology to 'build life-forms from scratch' which could put existing life forms at risk. Venter has also considered the implications of this type of information getting into the 'wrong hands' and has declared that all the methodology will remain confidential. Another measure he and Smith will be taking immediately to ensure the project remains ethically viable, is to 'knock out the gene(s) responsible for *M. genitalium's* ability to attach to human cells. To this end the bioethics group led by Margaret Cho of Stanford University have given Venter ethical approval and he is probably working on his new project as you read this article!

3. The J. Craig Venter Science Foundation (JCVSF). The third not-for-profit organisation founded by Venter will be the funding body for TCAG, IBEA and TIGR. The funds will come from the TIGR endowment from stocks which Venter received as founder of Celera Genomics.

Venter's passion for DNA sequencing and more importantly, his ability to enhance the power of the information he has gained from doing so, has led him from apparently ruthless profiteering, to research with massive positive environmental implications.

Whether he turns his current projects into another moneymaking venture remains to be seen. Perhaps, now that he is in a position to fund his own research without having to give back his profits to the venture capitalists, the real Venter will materialise. As he says himself:

"In the not-for-profit world, things can happen in a very cooperative interactive fashion that can't happen in the commercial world. Very few scientists have had the level of press coverage that I've had from what I've done, and I'm trying to use the bully pulpit I've developed from all that attention to deal with important issues."

Whether this is just lip service or Craig Venter's genuine belief is a question to which only he knows the answer - but if it is true then perhaps he's not such a bad boy after all.

Lucy Harper
Molecular Biosciences
Aston University

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Sam Jaffe questions the validity of using citation analysis in the forthcoming **Research Assessment Exercise** and discovers it has as many opponents as supporters

Citation analysis: friend or foe?

EVERY FIVE OR SIX years, the United Kingdom's academic establishment sets out to perform an experiment on itself. Called the ***Research Assessment Exercise*** (RAE), the vast endeavour involves 60 research panels, each investigating a specific discipline, from musicology to genomics. The panels, consisting of about 15 eminent researchers per panel, evaluate the research output of every participating university and institute. In the end, each institution receives a ranking based on the quality of its research.

The RAE is enormously time consuming and costly. It takes up to a year of dedicated work by panel members and administrative staff of the academic departments. And the four Higher Education Funding Councils that sponsor it spend as much as £50 million for the report. The stakes are enormously high. In addition to the bragging rights such a qualitative ranking bestows, the final score of each school is used to determine how much overhead money the government will give to help fund a school's research.

The next RAE might be vastly different from the one completed in 2001. Faced with demands to make the process cheaper and fairer, the ***Higher Education Funding Council*** for England (HEFCE) is considering using citation analysis - ranking the number of times peers cite a researcher's work to determine the quality of the research - as a significant part of the RAE. *"Citation analysis is a very useful tool in assessing the impact of research,"* says Sian Thomas, Director of Research at the HEFCE, the main overseer of the RAE. *"It's impractical for many disciplines that the RAE tracks, especially in the humanities, but its efficacy had been proven in the life sciences."* She says the UK academic community which was once resistant to this analysis, is coming around to accepting it.

Yet many British biologists adamantly resist citation analysis as an assessment tool. *"The opportunity for distortions being created by the analysis of citation numbers is very great, and I think that, on balance, the use of citation analysis is having a negative impact on science,"* says John Brookfield, a reader in genetics at Nottingham University, who served on the biology panel of the RAE in 2001.

Analysing the Reluctant RAE

If the RAE does employ citation analysis it will be a watershed event in the United Kingdom. The practice of counting citation and using the data to assess a paper's impact was pioneered in the 1960s by Eugene Garfield, who also founded *The Scientist*. Garfield has long argued that citation analysis should be used for evaluating only large pools of scientists, such as when comparing the research output of a country, a scientific journal, or even a university department.

When non-statisticians break down the citation analysis to evaluate an individual researcher, the science behind it will often break down as well, according to Gregory Feist, a visiting associate professor of psychology at University of California and an expert in citation analysis. *"As long as it's one of many criteria being used to evaluate one individual, it's an excellent tool", he says. "But if it's the sole criterion you're just asking for trouble."*

Nevertheless, the practice has crept into individual evaluations. Often in the United States, for example, grants are awarded and jobs offered based on how many citations a scientist's papers have garnered. *"I'll use it when evaluating a professor up for tenure, but I've*

studied it and I know its limitations," says Blaise Cronin, Dean of Indiana University's School of Library Science. Such debate informs the reluctance to allow citation analysis to be used.

Unlike the United States, the United Kingdom has a centralised scientific infrastructure. Much of the money for research infrastructure (which includes salaries, building construction, and maintenance and miscellaneous costs) comes directly from the government and is awarded to schools, which then apportion it to individual faculty members. Up until the 1980s, bureaucrats in London apportioned the money to institutions, with little objective oversight from academia. The desire to adapt a more objective assessment led to the first RAE in 1986. Since which, an RAE has occurred every five or six years.

While the RAE certainly was a great leap in fairness over the previous method of apportionment, it still has its detractors. *"The RAE is enormously expensive"*, says Andrew Smith, a member of the Department of Psychology at Royal Holloway of the University of London.

Enter Citation Analysis

If the laborious RAE could be replaced by a simpler statistical study using citation analysis, it could save untold millions of pounds, not to mention a few trees. *"It's a quick and dirty way to get to the same result,"* Cronin says.

But does it really end up with the same result? Several papers retroactively matched up citation analysis with the RAE results and came up with very similar conclusions. The most prominent paper, written by Smith and Phillip Eysenck of the University of London's psychology department, looked at the citation counts of about half of all psychology departments that submitted information for the RAE. By using citation analysis alone, the study came up with an extremely high correlation of 0.91 (with 1.0 being a perfect correlation), with the actual rankings determined by the RAE psychology panel.[1]

Smith asserts that many of the problems of citation analysis, such as excessive self-citation and the advantage of older researchers who have more papers under their belts, can be fixed with statistical adjustments. As long as citation analysis is used carefully and on a large scale, it is a perfect tool for the RAE, Smith says.

That's not to say researchers don't resist the idea. *"They're used to doing things using an old-boy network that works informally and subjectively,"* says Charles Oppenheim of the Department of Information Science at Loughborough University, a supporter of citation analysis.[2] Oppenheim believes that citation analysis can work effectively as does the peer-review panel.

Some critics of citation analysis admit that part of the resistance to it in the United Kingdom is based on cultural differences with the United States. "*The way the system works in the UK is that if you don't screw up, you get tenure,"* says Julian Warner, an information scientist at Queen's University of Belfast. *"In the US, there's a lot more openness to using raw data to determine your career. Here, they're scared of it."*

Warner is not a proponent, however, of using citation analysis for the RAE. He agrees that it reflects the same results as the old subjective method but is more worried about its effect on science as a whole. *"The act of citing is a human activity,"* he says. *"If you change how it's interpreted, you'll change the activity."* He adds that if the RAE accepts citation analysis, he fears it will be only a matter of time before citations will become a kind of currency scientists trade out for favours. Julian Warner believes the original purpose of a citation - to refer readers back to necessary source material - will be lost. And science will suffer.

Nevertheless, he admits that citation analysis will become more commonplace in the coming years, whether or not the RAE adopts it. Already the governing bodies of science in Australia, Canada, and some German federations, have adopted it, so the United Kingdom probably isn't too far behind. As Warner puts it: *"It's the most effective weapon in the armamentarium of objective evaluation. Sooner or later, it will be accepted here and everywhere else."*

Sam Jaffe

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Lab on a chip:

diagnosis and onsite testing

John Coote reports on this year's January Meeting

THIS YEAR'S JANUARY MEETING took place in the Holiday Inn, Birmingham on 8th and 9th January 2003. The meeting was entitled ***"Lab on a chip - diagnosis and onsite testing"*** and over 100 delegates turned up to listen to what proved to be a very stimulating range of topics presented by engineers, chemists, physicists and microbiologists, all concentrating on techniques designed to diagnose the presence of multiple microorganisms or their products in a clinical, food or environmental setting in the quickest possible time. The electronic chip, designed in the form of a biosensor, has opened up the possibility of comprehensive, simultaneous analysis for the presence of multiple pathogens or their products or for parallel testing for the presence of specific drug-resistance alleles. Many thousands of spots of nucleic acids or proteins can be deposited onto a solid surface, the 'chip', no larger than a microscope slide.

In the case of DNA arrays, chemical bonding between the reference probe on the solid surface and complementary sequences in the target in the sample solution provides information about the nucleic acid sequences present in the sample. For proteins, the analogous reactions are between antigens and antibodies and these form the basis of protein arrays. Miniaturisation is achievable where the system responds electronically to binding of test material to an array spot usually via fluorescence emission from DND/DNA hybrids or antigen/antibody complexes. Image analysis software correlates the position of the fluorescence with the identity of the reference probe. This multiplex identification system, when coupled to the miniaturisation of the chip components, provides the opportunity for development of portable hand-held devices for use onsite or at the point of care. Automation of these complex processes is the goal where no user intervention is required after samples are loaded and results are obtained in a matter of minutes. The meeting addressed both current uses and technological developments in several areas of biosensor detection. It included contributions from companies and researchers active in these fields with 'portability' as a major theme, but speed and ease of detection, safety, quality control, cost effectiveness and the need to fulfill the requirements of the end-user were all considered during the course of the meeting.

Technological Developments and Clinical Applications.

Chaired by **John Coote** (morning), **Alastair MacMillan** and **Peter Borriello** (afternoon).

Jonathan Cooper (Electronics Department, Glasgow University) started the meeting with an introduction ***'Microsystems technology in bioanalytical sensing'***.

He concentrated on the opportunities that microsystem technology offers for improved bioanalytical analysis. He first outlined the advantages that microsystems have over conventional assay formats; faster responses, improved signal to noise ratios offering greater sensitivity, faster thermal cycling times for procedures such as hybridisation and PCR, the capacity to integrate processing and detection in one format and low cost. He then went on to discuss developments in his own laboratory which included

The **electronic chip**, designed in the form of a biosensor, has opened up the possibility of comprehensive, simultaneous analysis for the presence of multiple pathogens or their products or for parallel testing for the presence of specific drug-resistance alleles

research into 3-dimensional array formats and exploration of more sensitive detection methods than the measurement of fluorescence which is currently favoured as the signal for detection of any interaction between probes and target on the electronic chip. He finished up by noting the diversity of assay systems now amenable to microanalysis, including not only detection of microorganisms but also detection of chemicals, physiological changes in the body using a chip-based sensor introduced into the host, and metabolic changes in cells as a response to drugs.

Peter Ghazal (Scottish Centre for Genomic Technology and Informatics, Edinburgh University) followed with a talk on ***'Molecular signatures for diagnosis of infection'***.

He explained how microarray technology enabled high throughput analysis of a huge spectrum of the genome content of organisms or their gene expression. This has led to a rapidly expanding domain of information science which requires new bioinformatic measuring technologies to provide the most appropriate statistical analysis of the data. Working mainly with viral geneomes, his laboratory has used microarray technology to provide instant genome sequence detection for strain differentiation and genotyping of viral pathogens for epidemiological studies. In addition, microarray analysis of the host gene expression responses to pathogen invasion provides a pattern of gene expression or infection 'signature' characteristic of each virus. Thus characteristic gene expression profiles of cytokines, stress response proteins, protein synthesis or the cell cycle and apoptosis can be detected. The challenge now is to use this data to identify new therapeutic targets and to sample cells from a naturally infected host in order to provide an early prediction of the type of infection involved.

Richard Watts (Nanogen UK, Cambridge) presented ***'The Nanochip® and its applications in microbial analysis'***.

The Nanochip® represents an example of an easily portable device which with further development could be employed at point of care for pathogen diagnosis. Richard explained the nature of the Nanochip® which is comprised of an array of one hundred independently controlled microelectrodes on a silicon chip. In conjunction with the Nanochip® Molecular Biology Workstation, charged particles (DNA/RNA) can be easily manipulated and hybridised to one or many electrodes in seconds rather than hours. This allows for one hundred different samples to be addressed to the chip. Independent adjustment of the electrical bias on each microelectrode offers the ability to accurately control hybridization reactions. This circumvents the need for thermal or chemical denaturation when stringent discrimination is required at a specific electrode(s).

Richard showed how the analysis of polymorphisms and presence of sequence specific markers such as heterogenic identification sequences or resistance genes, can be easily achieved on the Nanochip® making it ideally suited to microbial analysis. Furthermore, he explained how isothermal amplification by means of strand displacement amplification can be accomplished on the Nanochip® surface, negating the need for PCR.

Peter Borriello (Central Public Health Laboratory, London) began the afternoon session with a talk on ***'Lab on a Chip applications for pathogen diagnosis'***. Peter began by emphasising what he called a revolution in the manner in which seemingly disparate fields of nucleic acid analysis, bioinformatics, nanotechnology, micro-electronics and solid state and combinatorial chemistry are all being employed together for the detection and characterisation of pathogens. These devlopments, particularly with regard to near-patient testing, have important implications for the delivery of health care. They offer the once science fiction scenario of taking a drop of blood, urine or saliva and within an hour knowing which pathogen is present, its type designation and its antimicrobial resistance potential. He outlined how new PCR procedures, such as Lightcycler PCR, offers quantitative analysis of, for example, viral load and can be used for mutational analysis by adjustment of annealing temperatures. The application of mass spectrometry to microbiology is set to have a major impact.

By identifying surface antigens of a microbial cell, MALDI-TOF or SELDI-TOF techniques provides pathogen and even serotype identification in 3 minutes. These techniques will allow quicker and more appropriate prescribing for diseases such as meningitis.

Guy Vernet (BioMerieux, France) followed with a presentation entitled ***'Species differentiation and antibiotic susceptibility testing with microarrays'***. Guy began by noting that for some important human pathogens like *Staphylococcus aureus* or *Mycobacterium tuberculosis*, there is a need not only for accurate and rapid species identification and strain typing, but also a need to define its antibiotic resistance profile at the same time. Assays based on molecular biology technologies have been introduced in recent years into the diagnostic laboratory and their clinical value is now well established, especially for the identification of difficult-to-grow bacteria, for the epidemiological characterization of strains involved in nosocomial infections and for the detection of mutations associated with resistance to antibiotics. Analysis with high-density microarrays following multiplex nucleic acid amplification allows for simultaneous testing of a specimen for any number of suspected pathogens. He outlined how these assays rely on the purification of nucleic acids directly from the patient specimen or from a culture taken from the specimen, on the multiplex amplification of the genetic targets of interest, on the hybridisation of the labeled amplicons on microrrays and, finally, on the analysis of genetic information from specific sites within the different targets with adapted software and algorithms. Guy described feasibility studies conducted on two assays for *Mycobacterium* and *Staphylococcus* genera, based on the photolithography DNA-Chip technology developed by Affymetrix. The *Mycobacterium* assay combined species identification for 135 sequevar that represented 80 species, strain typing of species inside the tuberculosis complex and detection of mutations linked to resistance to Rifampin. Species identification was done using primers specific to the *Mycobacterium* genus located in the 16S ribosomal DNA sequence. 104 Rifampin mutations were detected in the *rpoB* gene of *M. tuberculosis* following the amplification of approximately 1000 nucleotides. The assay can be performed within a working day on a smear-positive sputum sample. The *Staphylococcus* assay combined species identification for 34 species, typing of *S. aureus* strains and detection of several genes or mutations linked to resistance to methicillin, fluoroquinolones and aminoglycosides. Species identification was done with primers specific for the *Staphylococcus* genus and the detection with the Chip of a combination of sequence signatures in the 16S rDNA.

The efficiency of several genomic approaches for typing that have been implemented on the Chip are currently being evaluated, including Multi-Locus Sequence Typing (MLST) using the allele determination of 7 housekeeping target genes. The presence or absence of sequence signatures of the *mec*A gene determine the resistance to methicillin. Allele analysis of 3 genes (aac[6']-aph[2''], aph[3']-III, Ant[4'][4'']) allows the determination of the resistance profile against aminoglycosides. Finally, the detection of 39 mutations in *grl*A and *grl*B denotes the resistance profile to fluoroquinolones. The objective of these assays is to perform the multiplex analysis of these different targets within a working day starting from a unique colony. Results obtained with the two prototype assays as well as with other reagents in the fields of clinical virology or food industry testing show that the microarray technology is very promising and will soon be part of the laboratory tools available to microbiologists.

Guy Vernet's talk was followed by two offered papers. **Richard Anthony** (KIT Biomedical Research, Netherlands) described a novel flow-through array system, the 'PamChip' (PamGene International, Netherlands) which allowed Mycobacterial speciation by hybridisation

in minutes. Unpurified labelled PCR products were directly applied to the PamChip and the resulting hybridisation detected using a fluorescent microscope with CCD camera. The large 3D surface of the porous PamChip results in extremely rapid hybridisation as the nucleic acid probes are immobilised in the membrane and the hybridisation fluid passes back and forth through the membrane. Direct detection of the fluorescence due to hybridisation allowed the species from which the PCR products were obtained to be determined within 20 minutes. Single nucleotide polymorphisms could easily be detected. Additionally, as the system is real time, temperature control of the hybridisation chamber allows the melting characteristics of each amplicon and probe combination to be studied. When combined with "rapid" PCR amplification this system allows all steps required for an array-based assay to be performed in less than one hour. They have created an array which can speciate mycobacteria and predict rifampin resistance and as additional probes do not increase the time or complexity of the assay, arrays allowing the simultaneous detection of markers for other resistance genes are being developed.

Richard Goering (Creighton University School of Medicine, Nebraska, USA) described a universal reporting approach to the detection of SNPs in the chromosome of *Staphylococcus aureus* using the Nanogen Nanochip® Workstation. The *Gyr*A subunit of the DNA gyrase gene in *S. aureus* has been extensively studied due to its relationship to quinolone resistance. He described the microarray analysis of *gyr*A, whereby a 914 bp region of the *gyr*A gene was PCR amplified and sequenced from a panel of 17 methicillin-resistant *S. aureus* (MRSA) isolates. Out of 61 SNPs, 8 were selected for microarray analysis and each SNP was analyzed in 6 isolates with both 'traditional' and universal reporting methods. The results showed that microelectronic array analysis produced data equivalent to those obtained through traditional reporting and conventional DNA sequencing for all of the SNPs analyzed in each of the isolates. With the Nanogen microelectronic array platform, genomic differences within the gyrA gene were rapidly and accurately assessed.

After a break for refreshment, **Andrea Ardizzoni** (Imperial College of Science, Technology and Medicine, London) talked about ***'Antigen microarrays for serodiagnosis of infectious diseases'***.

He explained how their laboratory has applied the microscopic array principle to develop a microarray immunoassay for the simultaneous, quantitative determination of IgG and IgM antibodies to *Toxoplasma gondii*, Rubella virus, Cytomegalovirus (CMV) and Herpes simplex virus types 1 and 2 (ToRCH panel) in human serum. Microarrays of human IgG, IgM and viral antigens were printed on activated glass slides using high-speed robotics. After incubation with samples and fluorescent probes, the slides were washed, dried and scanned using confocal microscopy and quantified using antibody dilution curves. The sensitivity of the human IgG array test was calculated as 0.5μg/mL; precision ranged from 1.7% to 14.6% for all ToRCH parameters. Using a panel of clinical samples, an excellent agreement was obtained with enzyme immunoassay data, e.g. for CMV, out of 56 samples analysed with the microarray test, 36 were classified as positive, 18 as negative and 2 as equivocal. The corresponding results with an ELISA were 37 positive, 18 negative and 1 equivocal. The microarray test format thus provided equivalent performance to ELISA tests but had a significant advantage in convenience, time and cost as it allowed multiple serological parameters to be done in 20 minutes (regardless of the number of parameters, the time-to-result is the same); the equivalent ELISA typically took 100 minutes to perform for a single parameter, with ten parameters taking proportionately longer. Microarray tests could be incorporated in a fully automated immunoassay platform for routine use in clinical chemistry laboratories.

The final talk of the day was given by **Peter Mackie** (Yorkhill NHS Trust, Glasgow) on ***'Near patient testing - safety issues and quality control'***. Peter described the explosion in the repertoire of point of care testing (POCT), or near patient testing, which has the potential to change dramatically established diagnostic approaches. In cases of acute infection, it is now possible to screen for a range of bacterial and viral antigens or for inflammatory markers such as C-reactive protein. The prospect of utilising molecular based technology within this environment is now a realistic and exciting proposition. He noted that the major benefit of POCT is the rapid availability of results, 24-hrs a day, and their influence on patient management, but then introduced a note of caution with the observation that these tests are currently often performed by non-laboratory health-care workers (HCWs) under variable circumstances and may be prone to significant operator-dependent error. He illustrated the provision of a successful 24 h acute point-of-care screening system by taking an example involving the diagnosis of respiratory syncytial virus (RSV) infections in a short stay unit adjoining the accident and emergency department of the large paediatric hospital. Three studies were conducted over consecutive winter epidemics in which 2193 nasopharyngeal aspirates were obtained from

children <2 years old. An average of 23 trained HCWs tested aspirates with the Abbott TESTPACK® RSV assay. The same material was also sent to the on-site virology laboratory for identification of RSV and other respiratory viruses by direct immunofluorescence. The mean performance characteristic of POCT was: sensitivity 90%, specificity 92%, positive predicative value 92% and negative predictive value 92%. This was acceptable for clinical purposes. Peter emphasised that the institution of reliable POCT is complex and his paper examined issues relating to training; quality control; safety; requirements for CPA accreditation; responsibility; and necessary controls on the scope of tests.

Peter Borriello then summed up the day's proceedings by reiterating the enormous potential that microsystem biosensors have for rapid clinical diagnosis while at the same time noting that the main problem now with nucleic acid-based systems is at the front end where sample preparation for subsequent PCR or hybridisation analysis is often the rate determining step with regard to speed and accuracy, with the ensuing probe/target interaction and data read-out on the other hand being very quick. He also noted the important points raised by Peter Mackie about the need for adequate training and quality control together with the obvious cost/benefit assessments.

A **Trade Show** reception by the companies who had generously sponsored the meeting, BD Biosciences, Don Whitley Scientific, MWG-biotech, Nanogen and Pamgene, was held before the conference dinner in the evening.

Environmental and Food Safety Aspects

Chaired by **Jean-Yves Maillard** and **Mark Bailey** (morning), **Peter Silley** (afternoon).

Gary Saylor (Center for Environmental Biotechnologies, University of Tennessee, Knoxville, USA) began the next day with a presentation on ***'BioMicroElectronic sensors for monitoring environmental pollutants in situ'.*** Gary introduced Bioluminescent Bioreporter bacterial strains containing *lux*CDABE transcriptional fusions to selected promoters which respond to selected environmental stimulants by expressing the *lux* operon to produce easily detectable bioluminescence. These whole-cell biosensors have been developed for chemical biosensing applications e.g. for detection of polychlorinated biphenyls, process monitoring and high throughput screening. In order to utilize these strains effectively in the environment, the organisms must be mated with an appropriate analytical device for quantitation of the induced light response and transmission of that data to an appropriate data logger. Reporter cells are immobilised onto a chip using an immobilant such as alginate, the test sample allowed to flow past the chip and both fibre optic based photon counting and *in situ* photomultiplier technology have been successfully exploited for subsurface soil and groundwater monitoring purposes.

More recently a 0.5 micron Complementary Metal Oxide Semiconductor (CMOS) was used to develop highly sensitive microluminator chips for fabrication of a Bioluminescent Bioreporter Integrated Circuit (BBIC). The BBIC technology integrates bacterial sensing of chemical agents with an induced light response from lux fusions that are quantified directly on the chip. This new microelectronic biosensor technology can be implemented at low cost and still retain analytical sensitivity at part per billion levels for selected chemical agents and it may well be suitable to use this system within the human body to monitor such things as blood glucose levels in real-time.

Mark Bailey (NERC Centre for Ecology and Hydrology, Institute of Virology and Environmental Microbiology, Oxford) followed with a talk on ***'Identification of bacteria (GMOs), their genes in relation to function and diversity in the natural environment'.*** Mark started by noting that in a natural environment many different microorganisms co-existed and one of the major challenges to microbiology was defining the role of specific prokaryote communities in ecosystem function. Whilst we may have a reasonable view of the extent of microbial diversity, there is a need to correlate this with particular activities so that the microorganisms that play a central role in biogeochemical cycling can be identified. Over the last decade considerable advances have been made in microbial ecology by the application of molecular methods that provide community diversity signatures, based primarily on 16S and 23S ribosomal RNA analysis. Although these widely adopted approaches successfully report on microbial community succession and allow the comparison of diversity between sampled habitats, they are unable to determine which component groups are functionally active. This is particularly relevant to the community analysis of natural samples which contain high proportions of as yet uncharacterised organisms, many of which are recalcitrant to current *in vitro* isolation methods. Mark described the developemnt of a generic method for characterising function based on the physical separation of RNA (ribosomal RNA and messenger RNA) molecules that have increased density due to the incorporation of heavy isotopes of ^{13}C and /or ^{15}N which. allows the identification of populations of bacteria that are functionally active in environmental samples. The isotopes are provided from labelled sole substrates (e.g. ^{13}C phenol). After incubation of environmental extracts or cultures with the labelled compound the newly synthesised "heavy" RNA is separated by density gradient centrifugation and phylogenetic analysis carried out following RT-PCR rRNA amplification and sequencing. It was demonstrated how this method was applied to an industrial waste water treatment plant to determne the key organisms involved in the degradation of phenolics. The approach identified a novel species which was responsible for the majority of activity and allowed for

optimisation of processivity and reactor performance.

Andrew Porter (Department of Molecular and Cell Biology, University of Aberdeen and Haptogen Ltd, Aberdeen) then gave a talk on ***'Recombinant antibodies - immuno-molecules tailor-made for biochip applications?'*** He began with the observation that the ability to select antibody fragments displayed on the surface of large numbers ($>10^8$) of different filamentous bacteriophage provided a complementary technology to the well-established selection of antibodies from hybridomas. The main advantages of this combinatorial library based approach for monoclonal isolation included speed; robustness and flexibility of the selection process; co-isolation of the antibody genes allowing further protein engineering and the opportunity to select antibodies from a range of sources. This technique has allowed the isolation of antibodies with high affinities to a wide variety of proteins, but it remained a much greater challenge to isolate antibodies with high sensitivities to small hapten targets (less than 1000 Da). Such targets included biological toxins, environmental contaminants and many drugs where chemical detection is expensive and time-consuming. Andrew outlined his selection strategies to identify a number of "super-sensitive" anti-hapten antibodies, e.g., against toxins such as microcystin. He emphasized that when an antibody is applied to a chip surface, it must not only be very stable but also have a high sensitivity. For a chip format these small, stable single chain antibody molecules are ideal as a large number can be applied to a single chip. He described the development of an antibody biosensor specific for triazine herbicides that can achieve sensitivities of below 0.1 mg per litre (100 ppt) in water samples.

Ian Barker (Central Science Laboratory, York) spoke after the coffee break on ***'DNA-based microarrays and immunoassays for laboratory and on-site testing in food and agriculture'***. Ian first noted the efficiency obtained with real-time PCR for high throughput of samples (12,000 samples/week) for routine analysis of foodstuffs for microbial contamination. Indeed portable PCR equipment for on-site testing was now beginning to be introduced. At present lateral-flow devices for pathogen detection are used at points of food intake into the UK. He went on to describe development work with a microchip-based assay where probes for all quarantined potato pathogens are arrayed and he showed data to indicate that this chip-based assay worked as proof of principle. The potato pathogens, which include viruses, bacteria and fungi, are now routinely assayed by an assortment of different methods and introduction of the chip-based assay would allow all to be assessed at one time. Ian also added that the chip-based assay allows strain differentiation to be done easily as oligonucleotide probes can be produced after sequence analysis of, for example, rotavirus genes and then arrayed on a chip for strain differentiation in test samples. He ended by emphasising that the highly parallel chip-based assays are fine for a small number of samples, but for high throughput analysis they may not be ideal for reasons of cost.

Colin Dalton (Institute of Bioelectronic and Molecular Microsystems, University of Wales, Bangor) followed with a presentation on ***'Detection of microorganisms in water by electrorotation chip technology'.*** Colin started by explaining the principle of electrorotation whereby a sample is surrounded by 4 electrodes which rotate and create a field strength dependent on rotation speed and the medium used. Some microorganisms rotate with the field, others stay still and some rotate in the opposite direction to the field. This AC electrokinetic technique has been used to probe the structures of the transmission stages of several intestinal parasites of man. Results were presented from three protozoan genera, *Cryptosporidium*, *Giardia* and *Cyclospora*, and from the nematode genus *Ascaris*. Rotational spectra recorded as a function of applied field frequency revealed differences between viable and non-viable particles, sporulated and unsporulated oocysts and fertilisation state of ova. For example, viable and non-viable *Cryptosporidium* oocytes rotate in opposite directions under appropriate conditions. He noted that a clean preparation of organisms is a requirement for this technique, but it is non-invasive and can distinguish between living and dead organisms. The data can be analysed using a mathematical model that can help predict the most likely cause of differences in the spectra. John subsequently described how AC electro-kinetics can also be used for particle manipulation. He then presented a selection of microelectrode designs that can be used for concentration, translational motion and the selective trapping of particles, including dielectrophoresis where an applied electrical field is used to differentially attract living and dead cells.

After lunch, two offered papers were given. **David Cowell** (Centre for Research in Analytical, Materials and Sensor Science, University of the West of England) reported on the ***rapid electrochemical detection and identification of catalase positive micro-organisms.*** He noted that rapid detection and identification of bacteria has application in a number of fields, for example, the food industry, environmental monitoring and biomedicine. He stressed that while in biomedicine the number of organisms present during infection is often multiples of millions, in the other fields it is the detection of low numbers of organisms that is important, for example, an infective dose of *Escherichia coli* 0157 from contaminated food is less than 100 organisms. He described a rapid and sensitive technique to detect low numbers of the model organism *E. coli* 055 which combined Lateral Flow Immunoassay (LFI) for capture and amperometry for sensitive detection. Antibodies to *E. coli* O55 were applied to nitrocellulose membranes to capture the bacteria as they flowed through the membrane to an absorbent pad. The LFI strips were placed in close contact with electrodes of a Clarke cell poised at +0.7 volts for the detection of hydrogen peroxide. Earlier research had shown that consumption of hydrogen peroxide by bacterial catalase provided a sensitive indicator of the numbers of aerobic and facultative anaerobic microorganisms. Use of the LFI strips demonstrated that the consumption of 8mM hydrogen peroxide correlated with the number of microorganisms presented to the LFI strips in the range of $2x10^1$ to $2x10^7$ cfu. Capture efficiency was dependent on the number of organisms applied and varied from 71% at $2x10^2$ cfu to 25% at $2x10^7$ cfu. The procedure was completed in less than 10 minutes and could detect less than 10 cfu captured from a 200 ml sample applied to the LFI strip. The method provided proof of principle for the rapid, quantitative and sensitive detection of bacteria that express catalase activity.

Kees Roest (Laboratory of Microbiology, Wageningen University, Netherlands) described ***an identification array platform for monitoring microbial diversity in anaerobic wastewater treatment systems.*** A DNA macro array for detection of molecular diversity in Upflow Anaerobic Sludge Blanket (UASB) was developed using 80-mer variable regions of cloned and identified 16S rDNA sequences from sludge, which were amplified and blotted onto a filter. Focus was on the V6 region, which appeared to be promising for identification with an array. Kees reported that more variable regions of sequenced clones would be used to develop a multiple probe array. The developed macro array will be miniaturized to an identification DNA micro array and used for rapid molecular detection of microbial diversity in sludge of wastewater treatment samples.

The final talk was given by **Kim Sapsford** (Center for Bio/Molecular Science & Engineering, Naval Research Laboratory, Washington, DC, USA) on ***'An Array Biosensor for Detection of Biohazards'.*** Kim reminded the audience that array biosensors provide the possibility of immobilizing multiple capture biomolecules onto a single surface and therefore offer the exciting prospect of multi-analyte detection. She reported a miniaturized, fully automated, stand-alone biosensor, based on the principle of total internal reflection fluorescence (TIRF) that monitors interactions between capture antibodies arrayed on a glass slide and binding partners in test samples in 10 - 15 minutes. A variety of analytes including toxins such as cholera toxin, bacteria such as *Campylobacter jejuni* and viruses have been detected both in buffer and complex matrices, such as blood and soil suspensions, with comparable detection limits. The instrument she described has been used for real-time analysis of both specific and non-specific binding interactions. A number of developments have led to a TIRF array biosensor weighing only 5.5 Kg which is automated for environmental, clinical and food monitoring or biological warfare agent detection.

Conclusion

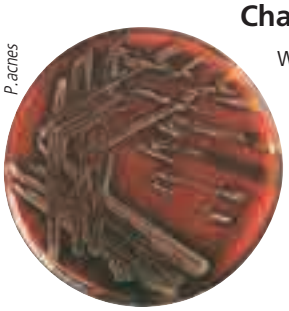
The meeting was brought to a close by the sfam President Peter Silley with a summary of his impressions. He was gratified to see such a diversity of scientists from different disciplines and thanked the speakers for their presentations. He was pleased that the applied aspects of ***'Lab on a Chip'*** had been emphasized and reminded the audience that for uptake into the mainstream all the techniques and equipment had to be seen to offer serious benefits to the end-user whether in the hospital, veterinary, food or environmental sectors, but he was sure that they would now have a greater appreciation of the range and possibilities of this rapidly expanding and exciting new field.

The meeting was a very enjoyable experience and demonstrated the range of biosensor applications under development and the position that some of them have now obtained in the clinical, food or environmental fields. It was particularly interesting to see that biosensor detection involving protein/protein interactions seems to be keeping pace with that involving nucleic acid interactions. The cost of these systems will undoubtedly fall and, whereas at present they are finding application in more specialised fields such as environmental monitoring or airborne pathogen detection, it seems only a matter of time before they are applied in more routine situations such as point of care procedures in hospitals, immuno-assays in clinical departments, or for routine monitoring of food products and industrial or water treatment plants.

John Coote
Division of Infection and Immunity, University of Glasgow

Due to an urgent business commitment, **Martin Pearce** (Detection Department, Dstl Porton Down, Wiltshire) was unable to attend the meeting to present his paper on ***'Rapid Detection of Microbial Pathogens'.***

Is Sciatica an infection?

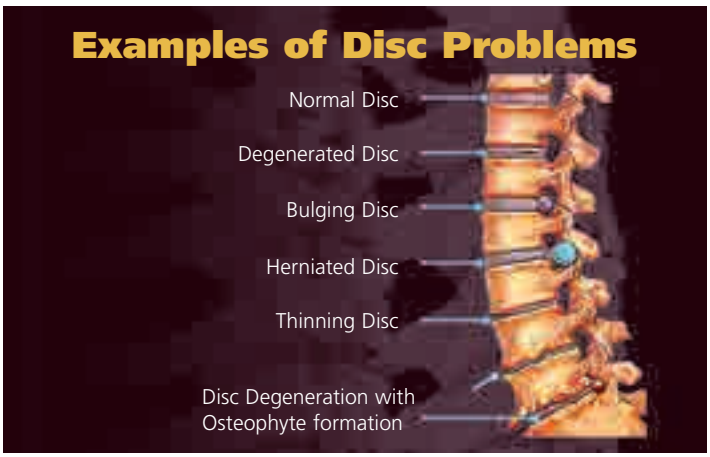

P. acnes

Charlotte Hall reviews the work of **Dr Peter Lambert** whose research has shown that microbiological infections may play a role in this painful disease

EACH ACADEMIC YEAR, the department of Pharmacy and Biomolecular Sciences at the University of Brighton organises a Friday lunchtime seminar programme. Dr Peter Lambert from Aston University was nominated by Dr Jean-Yves Maillard to give a presentation to the staff and, postgraduate and undergraduate students within the department. Dr Lambert's talk entitled ***Is Sciatica an infection?*** was, he informed us, "a bit of a side-line" from his usual topics (antibiotic resistance, infectious disease diagnostics and computer aided drug design to name but a few), but an interesting one nevertheless as shown by the great turn out.

We were astounded to learn that 40% of people in the UK are affected by back pain every year resulting in the loss of 180 million working days. Most lower back pain concerns sciatica. When we speak of sciatica most people associate this illness with ectopic pressure on the sciatic nerve following disc rupture or herniation. By a chance discovery, Dr Lambert told the story of how his research has shown that microbiological infections may play a role in this disease.

Back in 1996, Dr Lambert and colleagues at the Queen Elizabeth Hospital and Royal Orthopaedic Hospital in Birmingham discovered a novel exocellular non-protein antigen produced by *Staphylococcus epidermis*, which was later confirmed to be a short-chain lipoteichoic acid, named Lipid S. Over the following years, Dr Lambert and his colleagues developed an enzyme linked ELISA assay using the Lipid S antigen for the serodiagnosis of deep-seated Gram-positive infections, which was subsequently used to assess the role of *Staphylococus* in pyogenic spondylodiscitis (vertebral disc infection to you and I). In this study, patients suffering from suspected sciatica were used as control subjects. To the surprise of Dr Lambert, patients allocated to the control group showed that a remarkable 31% exhibited elevated serum IgG antibody levels to Lipid S. Having ruled out experimental procedures as the cause of these findings, the most obvious explanation was that sciatica might in fact have a microbiological aetiology due to low virulent organisms. Indeed, further evaluation of 36 patients with sciatica revealed that positive cultures (53%) could be obtained following microdiscectomy, of which 85% of these contained the epidermal bacteria *Propionibacterum acnes*. So how were these 'skin' bacteria traversing to the disc fluid? The most likely explanation, we were told, is following a wound to the skin e.g. after trauma (i.e. at the time of disc herniation) or after an epidural injection administered in severe cases of sciatica. This may then provide entry of *P. acnes* to the integrity of the disc resulting in a chronic inflammatory response. Again, further investigation showed that entry from the skin was unlikely since patients who did not receive an epidural could still exhibit positive cultures. So, for the time being the Dr Lambert told us that 'jury is still out'.



Dr Lambert is now looking into alternative sources of *P. acnes* infection in these patients from other sites within the body such as mouth, gut or via the blood. Since, *P. acnes* is largely associated with severe acne, an obvious question was the association with acne during adolescence and sciatica later in life.

Over refreshments, Dr Lambert's seminar provoked much discussion within the group, particularly amongst those who have suffered from back pain in the past!! Everyone was particularly interested in an up and coming clinical trial to determine the effect of microbial treatments in patients with sciatica, which may provide a more satisfactory treatment for back pain in the future.

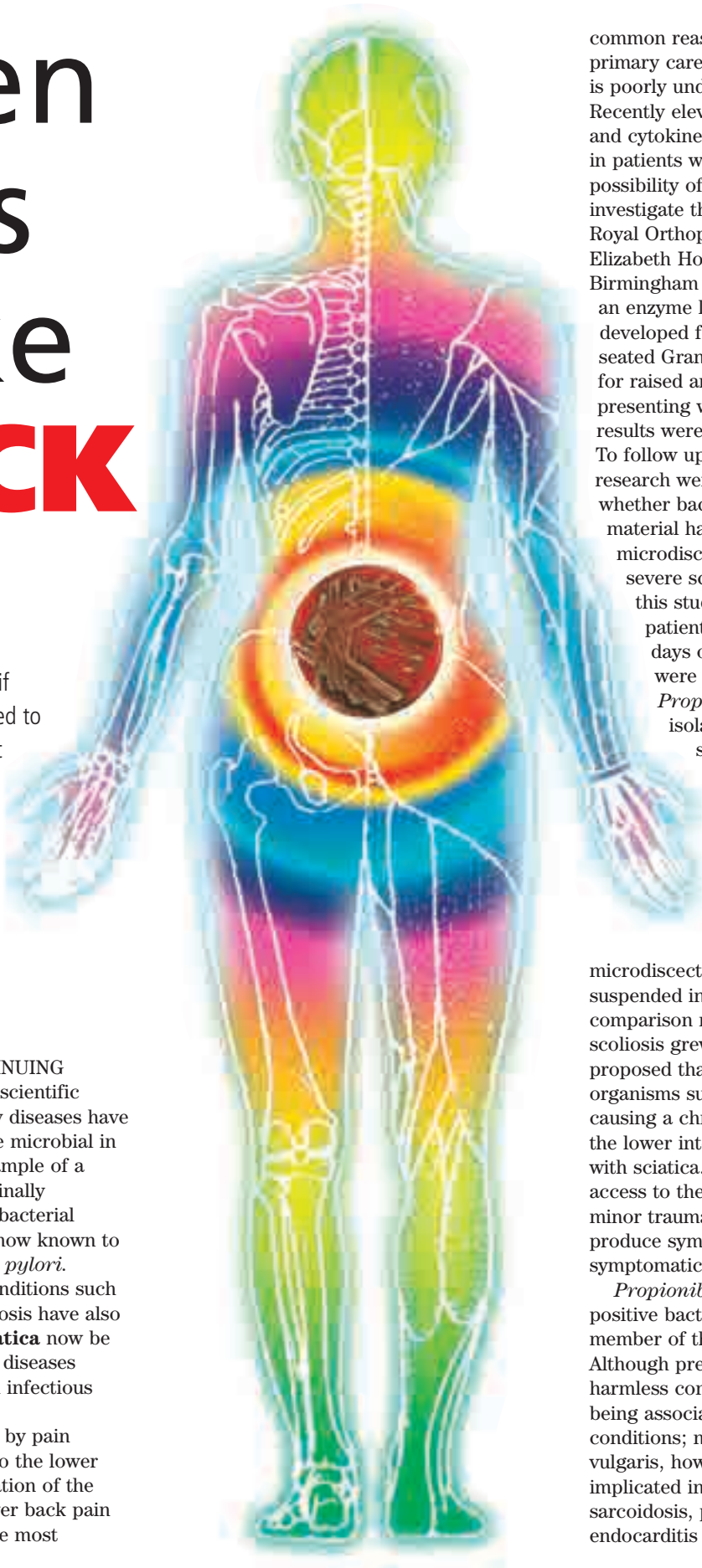
Charlotte Hall
University of Brighton

Further reading:

- "When Bugs strike Back" - see next page 40

When bugs strike BACK

Alexandra Perry asks if **sciatica** can now be added to the list of diseases thought to be caused by an infectious agent?



WITH THE CONTINUING advancement of scientific techniques many diseases have been found to be microbial in origin. The best-known example of a disease which was not originally suspected to be caused by bacterial infection is gastric ulcers, now known to be caused by *Helicobacter pylori*. Infectious links to other conditions such as arthritis and atherosclerosis have also been proposed. Could **sciatica** now be added to the list of various diseases thought to be caused by an infectious agent?

Sciatica is characterized by pain radiating from the back into the lower extremities caused by irritation of the sciatic nerve. Although lower back pain and sciatica are some of the most common reasons for consultation in primary care the pathogenesis of sciatica is poorly understood (Anon, 1995). Recently elevated serum immunoglobulin and cytokine levels have been described in patients with sciatica, raising the possibility of a microbial aetiology. To investigate this theory, researchers at the Royal Orthopaedic Hospital, the Queen Elizabeth Hospital and Aston University in Birmingham (Stirling *et al.*, 2001) used an enzyme linked immunoassay, developed for the diagnosis of deep-seated Gram-positive infections, to look for raised antibodies in patients presenting with severe sciatica. Positive results were observed in 31% of patients. To follow up this preliminary finding, research went forward to examine whether bacteria were present in disc material harvested during routine microdiscectomy operations to relieve severe sciatica. Control specimens for this study were obtained from patients with scoliosis. Within 7 days of incubation 53% of patients were culture positive and *Propionibacterium acnes* was isolated from 84% of the positive samples. Gram-stained smears of tissue samples embedded in agarose also showed Gram-positive branching rods after incubation (figure 1). Furthermore, *P. acnes* could be seen growing from a section of microdiscectomy tissue which had been suspended in nutrient agar (figure 2). In comparison none of the specimens from scoliosis grew bacteria. It was therefore proposed that low virulent micro-organisms such as *P. acnes* might be causing a chronic low-grade infection in the lower intervertebral discs of patients with sciatica. These organisms may gain access to the spinal disc after previous minor trauma and discs that do not produce symptoms may become symptomatic following infection.

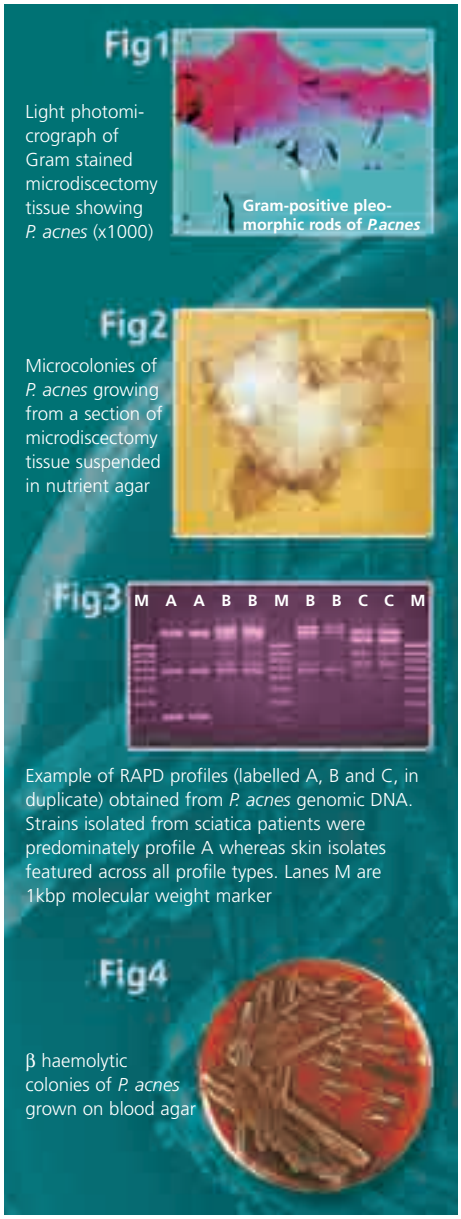
Propionibacterium acnes is a Gram-positive bacterium, best known as a member of the skin flora of man. Although previously thought of as a harmless commensal, it is increasingly being associated with numerous conditions; most notably with acne vulgaris, however it has also been implicated in endophthalmitis, sarcoidosis, prosthetic hip infections, endocarditis and osteomyelitis (Eady and

Ingham, 1994).

The surgical technique used in the Birmingham study used stringent aseptic techniques, however, in this and many other instances of presumed *P. acnes* infection, contamination of the samples with skin commensal bacteria always remains a possibility. This eventuality is difficult to disprove given the ubiquitous nature of *P. acnes*, but is being approached by using molecular typing techniques. Genotypic methods have been employed to determine whether infecting strains isolated from sciatica patients constitute a specific genotype in comparison to other *P. acnes* strains; in particular skin commensals. A modification of PCR called random amplification of polymorphic DNA (RAPD) which utilises short primers (8-10bp) and a series of low stringency annealing steps to amplify regions of genomic DNA has been used to type P. acnes strains. After multiple rounds of PCR, fragments of varying size are generated which give a specific DNA 'fingerprint' when separated by electrophoresis. Strains isolated from sciatica patients were found to be characterized by RAPD profiles distinct from profiles generated from *P. acnes* isolated from other sources (figure 3). This supports the hypothesis that an infectious strain of *P. acnes* is implicated in sciatica and that excised disc material is not becoming contaminated with skin commensal strains during surgery. Further study is currently being undertaken to genotype a wider diversity of strains including those found in acne lesions.

Propionibacterium acnes produce many exocellular enzymes including haemolysins, lipases, proteases, hyaluronidase and phospholipase C (figure 4). These factors may well contribute to virulence and disc pathology as this organism has the ability to degrade components of the extracellular matrix and destroy host cells. Indeed, studies have shown that exocellular enzyme production by *P. acnes* is optimal at low oxygen concentrations (Cove *et al.*, 1983). The low oxygen micro-environment of the intervertebral disc may therefore play a major role in the production of these enzymes.

In *P. acnes* endophthalmitis symptoms typically present months after cataract surgery. This violation of the eye could be likened to minor trauma of the intervertebral disc which may allow



microorganisms to access a site of immune privilege. Similarly, both the eye and the intervertebral disc are predominately avascular.

As stated earlier, inflammation has been implicated in sciatica but the cause of this is uncertain. Could *P. acnes* have a role? The immune response to *P. acnes* has been well-characterised in acne patients and proliferation of this organism in the pilosebaceous follicles of the skin is associated with the production of cytokines and other proinflammatory molecules (Leyden, 2001). *P. acnes* may therefore have a role in the initiation or modification of the inflammatory response associated with some disc herniations.

Research is currently underway to investigate the immune response of sciatica patients to *P. acnes* in an attempt to identify potential markers of *P. acnes* infection and possible mediators of inflammation. An antigen that could be exploited for use in an ELISA would be particularly advantageous compared to microdiscectomy and subsequent culture of disc material to confirm *P. acnes* infection.

The results of this research are particularly exciting however work is still in its early stages and a causal relationship between *P. acnes* and sciatica has not yet been established. If further research and potential clinical trials confirm an association between *P. acnes* and sciatica, early diagnosis could lead to improved treatment strategies such as intervention with appropriate antibiotics to modify subsequent progression of the disorder.

Could *P. acnes* be to sciatica what *H. pylori* is to gastric ulcers - a microorganism considered non-pathogenic found to be the causative agent of a 'non-infectious' condition?

Alexandra Perry
Molecular Biosciences, Aston University

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Further reading:

You can read more about the possible role of *P. acnes* in the development of **sciatica** in the report by **Charlotte Hall** on page 39

The Society offers FULL members an opportunity to give undergraduate students of microbiology the chance to obtain work experience during the summer vacation. Grants can be made available to ANY FULL member who is able to offer a suitable undergraduate student a work placement for a period of up to 10 weeks during summer.

For further information visit the website at www.sfam.org.uk

picture by kind courtesy of Unilever Research

Production of anti-microbial compounds by lactic acid bacteria (LAB) and modulation by the environment

DURING June and July 2002 I had the opportunity of working in the Food Microbiology Unit, University of North London (now London Metropolitan University, on production of anti-microbial compounds by lactic acid bacteria (LAB) and modulation by the environment. Lactic acid bacteria are Gram-positive non-sporing rods or cocci, aero-tolerant anaerobes and are known to produce inhibitory compounds including organic acids e.g. lactic and acetic acids and bacteriocins. The purpose of the project was to attempt to reproduce and clarify an observation encountered during data generation for development of a predictive growth model for LAB. It was suspected that in certain environmental conditions, one or more strains of LAB might be inhibiting others in the cocktail of strains used to inoculate the different environmental conditions used to prepare the model.

There were four parts to the investigation. The seven strains of LAB were inoculated individually and as a mixture of strains, at a concentration of 10^4 cfu/ml, into the wells of microtitre plates containing MRS broth adjusted to 30 combinations of conditions encompassing a pH range of 4.0-6.0 and NaCl concentrations of 0.5-6.5% ($^{W}/_{V}$). This would demonstrate which strains were able to grow in the selected conditions.

Two specific conditions were selected, pH 5.5 with NaCl 4.5% and pH 5.5 with NaCl 6.5%. These conditions were inoculated with each of the individual strains of LAB and the cocktail of strains and incubated at 6°C. Samples were regularly taken throughout an incubation period of 6 weeks at 6°C and the LAB enumerated using dilution and plate count techniques. This would allow comparison of the growth rates of the different strains with each other and with the cocktail.

At 3 and 6 weeks, a kit method was used to quantify the amount of lactic acid

in samples from Experiment 2.

This would demonstrate whether any of the strains produced significant amounts of lactic acid that might be inhibitory to other strains.

At 3 and 6 weeks, samples from Experiment 2 were applied to "lawn" plates of MRS agar made in a) water and b) MOPS buffer. These were incubated at 10 and 22°C. This would demonstrate zones of inhibition around the drops. If inhibition occurred round drops on MRS / water agar, this could be due to acid or bacteriocin production, but if inhibition occurred on MRS / MOPS plates, then it would be caused by bacteriocins or non-bacteriocin antibiotics, not acid, because of the buffering effect of the MOPS.


Abigail Nnaghor

The pattern of growth of the individual LAB strains and the cocktail in microtitre plates was biologically sensible, in that visible growth took longer as the pH decreased and the NaCl concentration increased. The growth rates, measured in Experiment 2, showed that 3 strains of LAB (*Lactobacillus brevis*, *Lb. plantarum* and *Carnobacterium pisicola*) had faster individual growth rates at pH 5.5 and NaCl 4.5% than the cocktail of strains, suggesting that these strains are inhibited in the cocktail. At 6.5% NaCl, only *Lb. brevis* grew faster than the cocktail; *Lb. plantarum* grew at about the same rate as the cocktail and *Carn. pisicola* failed to grow at all. However, only *Carn. pisicola* (at 4.5% NaCl) produced significant quantities of lactic acid using the kit method and no evidence of bacterocin / antibiotic inhibition was observed on the lawn plates.

Although I was not able to identify the inhibitory agent in the limited time available, it does seem that interactions occur between LAB growing in a cocktail and this could have important consequences if predictive models for LAB are prepared using a mixture of strains. During my time in the Food Microbiology Unit, I gained many skills and experience in laboratory work, much more than from my normal practical classes. Overall, my placement allowed me to gain valuable work experience in a research environment, which I found challenging but enjoyable and I have developed skills in experimental planning, independent and team work, which will be valuable in the future.

I would like to express my sincere appreciation to sfam for giving me this opportunity. Many thanks to my placement supervisor, Dr Jane Sutherland, for guidance and assistance during the project and special thanks also to Dr Alan Varnam for his help in gaining this placement and to Richard Marshall for his support throughout my course.

Abigail Nnaghor
London Metropolitan University

Microbial deterioration of paints


Left to right: Queli, Christine Gaylarde and Cezar Crispim

PAINTS contain various organic materials which act as nutrients for microorganisms and can stimulate microbial growth both in-can and on the dry paint film. This seriously compromises the adhesion and durability of the paint, as well as its decorative function. The major groups of microorganisms involved in deterioration of the dry paint film are bacteria, fungi, algae and cyanobacteria, all of which are able to survive under conditions of stress (drying and rehydration cycles, UV exposure). The objective of this short project was to test the efficiency of two biocides used to protect the paint film, one a formulation containing Diuron (a herbicide), Carbendazin (a fungicide) and octyl-isothiazolinone (OIT - a broad spectrum biocide), and the other a mixture of isothiazolinone and benzamidazole derivatives.

The biocides were assessed using a standard test for resistance of surface coatings to mould growth, ASTM D 3273-94. This test uses an environmental chamber with defined temperature and humidity (28°C and 98%). The painted panels, inoculated with a standard mixture of spores of the fungi *Aureobasidium pullulans*, *Aspergillus niger and Penicillium sp.*, are incubated for 28 days before visually assessing fungal growth according to a given scale. The test was modified to test biocide activity against cyanobacteria. Two filamentous cyanobacterial species, isolated from painted surfaces, were used to inoculate the panels and the chamber was illuminated with fluorescent light tubes. Initial results suggest that the biocides protect the paint against fungal and cyanobacterial growth for a month (the recommended test period). However, I plan to continue examining the panels throughout the next 6 months to observe any longer term effects.

The second aim of my project was to learn some of the techniques of molecular biology, by assisting with the project of MSc student, Cezar Crispim. Although my undergraduate degree includes the theory and demonstration of DNA extraction and PCR, I have never been able to participate in the practical aspects. In the Departments of Soils and Biotechnology of the Federal University of Rio Grande do Sul, I extracted DNA from my own cyanobacterial and fungal cultures using two different techniques and carried out PCRs with specific primers for these two microbial groups. I hope to be able to apply these methods for the detection of these two groups of microorganisms on the painted panels in a future project.

I also learned about the routine of a microbiology laboratory, taking my turn at preparing media, autoclaving and washing glassware.

I wish to thank Dr. Christine Gaylarde and Cezar Crispim for their help and supervision and, especially, the Society for the opportunity to carry out this project. The training I have received will be very useful in my future work.

Queli Viviana da Silva
Porto Alegre, Brazil

The President's Fund Reports

Once again, our members have used a **President's Fund** grant to attend a variety of meetings and conferences around the globe. To find out how ***you*** could benefit from this valuable award check out the panel below or visit our website.

Am I eligible - can I apply?

The **President's Fund** provides limited grants to **ALL members** to assist them to attend scientific meetings or workshops related to their area of work. Awards are made at the sole discretion of the Honorary President.

Please note that this Fund is open to members of all ages! It is not only our student members who require our help. Senior microbiologists often find difficulty in funding attendance at meetings, and the President's Fund is there to help them. **If YOU are in this position, why not apply to the President's Fund?**

Guidelines

1 The applicant must have been a member for at least a full subscription year before the event to be attended and must be a fully paid-up member at the time of application.

2 A successful applicant cannot re-apply to the Fund for three years from the date of the award.

3 Preference will be given to applicants who are contributing to the meeting they wish to attend and/or are unable to obtain funds elsewhere.

4 Application forms, together with an abstract of any intended contribution to be made, must be received by the Society Office not less than six weeks before the date of the event.

5 Student member applicants must enclose a letter of support from their supervisor or head of department on the letterhead of their institution.

6 The maximum grant available is normally £500.

7 Under exceptional circumstances this maximum may be exceeded.

Applications for a grant from this Fund **MUST be made on the official application form**, available **ONLY** from the Society Office.

International Symposium on Waterborne Pathogens Lisbon, Spain, September 22nd - 25th 2002

The conference opened with a general session on Monday September 23rd introducing the latest information on emerging infectious diseases in water supplies. This was very informative ensuring the correct issues were being addressed across the world and not just the UK. Risk assessments were discussed in detail and the impact of microbial failures were highlighted.

The next important section was the current detection methods used and their effectiveness. The methods ranged from DNA Microarrays to detect multiple pathogens in water to high performance liquid chromatography. Many of the methods discussed were targeting the organism *Cryptosporidium*. The day ended with a historical waterworks tour in Lisbon. The tour included the 17th - 18th century aqueduct; one of Lisbon's landmarks, and it was an impressive example of hydraulic engineering as well as a reservoir with an interior waterfall that provides the staging for various cultural events.

Tuesday September 24th involved highlighting the source and the occurrence of the pathogens and what protective measures have been taken. A very good presentation was given by **Dr Gary O'Neill** from Yorkshire Water, he examined the link between *Cryptosporidiosis* and *Cryptosporidium* in drinking water in Yorkshire. **Dr Keith Osborne** from United Utilities Ltd (UK) discussed Watershed Protection in the wake of a *Cryptosporidiosis* outbreak.

The final morning was the most interesting for a microbiologist particularly when emerging and re-emerging pathogens were examined. The Environmental Surveillance Unit in the UK presented work on Crohn's Disease, Johne's Disease, *Mycobacterium avium* subspecies, *paratuberculosis* and water. Drinking water was the not the only form of discussion but so was wastewater treatment. A certain study was carried out in Greece that showed *Salmonella* maybe an issue for public health in recreational waters if the correct sewage treatment was not used. The conference ended on the topic of disinfection, which is one of the most important steps in drinking water treatment. If the disinfection of drinking water was effective at all times then in theory there would be no forms of waterborne disease. Unfortunately in reality there are many sources that can interrupt the effectivity of disinfection and one such example maybe to biofilm formation in the treatment processes. This area of research was of personal interest because my PhD research involves assessing biofilm formation on filter media within rapid gravity filters.

I thoroughly enjoyed the conference and spoke to many experts regarding my PhD. Lisbon is a beautiful city and the seafood was excellent!

Palwinder Kaur
University College London

The 13th International Pathogenic Neisseria Conference, Oslo, Norway, September 1st - 6th 2002

The Conference was held at the Oslo Kongressenter Kolkets Hus BA. The welcoming reception provided the opportunity to chat with colleagues and friends, many of whom were not seen since the last meeting held in Galverston, Texas, two years before.

The conference was opened by the Norwegian Minister of Health who expressed his pleasure at having such a prestigious meeting attended by scientists from all over the world to tackle a problem that is currently causing many deaths in Norway. He hoped that a new vaccine developed to meet their needs will be successful. A session on the pathogenesis of Neisseria started the conference with new discoveries such as signalling functions of the pilus that modify the host cell, presented by **M So** (Oregon Health and Science University, Portland, Oregon, USA).

Monday afternoon had presentations on clinical aspects and host defence.

Some exciting new work describing the stimulation of Toll-like receptors TLR2 and 4 by Neisserial PorB that modifies bacterial and host cell interactions was presented by **Peter Van der Ley** from Utrecht University, The Netherlands.

Brian Greenwood (London School of Hygeine and Tropical Medicine, UK) headed the vaccine session on Tuesday with an eloquent and informative presentation. Brian traced the spread of meningococcal disease back through historical records and included data from the Sudan that many were not familiar with. **Mark LaForce** (Programme for Appropriate Technology for Health, Ferney Volytaire, France) followed with a description of the **Meningitis Vaccine Project** (MVP) funded by Bill and Melinda Gates for the development and introduction of new vaccines for prevention of infectious diseases in the developing world. The session finished with a talk on *Neisseria lactamica*, a commensal organism, as a vaccine for meningococcal disease by **Karen Reddin** (CAMR, Salisbury, UK). Karen presented data on animals vaccinated with this organism that were protected against meningococcal bacteraemia, but in the absence of measurable serum bactericidal activity (SBA) that is dependent on complement killing. SBA has been used as the "gold Standard" for the development and introduction of vaccines since the late 1960's when Goldschneider demonstrated a correlation between protection against disease and SBA activity.

One of the great successes of this biannual meeting is the two hours allocated to poster viewing that allows them to be fully appreciated. The session follows immediately after lunch where coffee and cakes were served.

My post doc, **Kirsten Clow**, and myself presented two posters on our recent findings in the development of a group B meningococcal vaccine using conformational peptide mimics of carbohydrate epitopes as vaccine candidates. Two anti-lipooligosaccharide (LOS) antibodies with different epitopes were used to screen phage libraries displaying random cyclic peptides to identify epitope mimics. Some of these peptides successfully elicit antibody responses to meningococcal LOS and we are currently setting up assays to test their protective function. The posters received interest from many delegates, which included colleagues pursuing similar strategies. The day finished with a session on surface structures that included the crystal structure of the *Opc*A outer membrane protein by Jeremy Derrick from UMIST, Manchester UK. The structure allowed a testable model for its adhesion to proteoglycan to be tested towards unravelling its biological role. Afterwards we were invited to a reception at Oslo city hall; an impressive building where the Nobel prizes are awarded with splendid views of the harbour and fjord beyond. The Mayor of Oslo welcomed us to his city and wished us an enjoyable and successful visit, and gave us a tour of the city hall. Chilled champagne was sipped accompanied with strawberries and cream...delightful!

Mark Achtman (Max-Planck Institut für Infektionbiologie, Berlin, Germany) one of the greatest authorities on the epidemiology of pathogens gave a scintillating presentation. He began his presentation on serogroup A meningococcal disease emphasising the prevalence in China and adding with humour that this is an untapped market for the vaccine manufacturers, as more than 25% of the world's population is Chinese, and they are wealthy! He followed with the epidemiology of *Helicobacter pylori* which is carried by 50% of the world's population and can cause chronic gastric disease. The amazing conclusion of his study was that when humans were grouped according to the strain of *H.pylori* carried they confirmed the spread of mankind across the world, as well as separating populations according to their religion - remarkable and gripping stuff. He certainly had me hanging on his every word. The morning ended with a session on epidemiology and antibiotic resistance, two important topics in disease prevention and management. In the afternoon there was a choice of several sightseeing tours and I opted for a boat cruise around the fjord, which turned out to be perfect in the warm, late Autumn sunshine.

On Thursday morning there was a session on genome and gene expression in the which included post genomic technologies including DNA microarrays. A choice of four workshops followed, which included discussion of the W135 epidemic currently occurring in the sub-Saharan Meningitis belt that was deemed by many to be a great success. The conference dinner that evening provided not only a superb meal but entertainment and dancing with some traditional Norwegian songs thrown in.

The second half of the vaccine session ended the conference on a high note with an excellent presentation from **Martin Maiden** (University of Oxford, UK) describing the impact of the conjugate group C vaccine introduced in the UK in November 1999 on carriage organisms. The Neisserial community had anticipated that the group C organisms causing disease would switch their capsular polysaccharide to a non-vaccine serogroup. However, the meningococcus never ceases to amaze us and it didn't let us down on this occasion. From a preliminary analysis of the data just collated it appeared that carried organisms had successfully overcome vaccine protection by mutating to a capsule nul mutant that is acapsulate. This resembles the acapsulate commensal, *N.lactamica* that very rarely causes disease.

The talks I have highlighted are my personal reflections that stimulated various discussions with my colleagues. Overall, the meeting was an outstanding success and I would like to thank *sf*am for a generous grant from the President's Fund that made this trip possible. It is not often that scientific conferences are opened by the country's Health Minister and delegates are invited to a civic reception by the mayor of the city!

B M Charalambous
Medical Microbiology,
University College London Royal Free Campus

Risk Modelling Training Course on Animal Health and Food Safety

Les Leches, France
September 2nd - 13th 2002

The course was divided into two self-contained parts, each running for a full business week in a private residence at a small village, Les Leches, a few hours from Paris. In addition to myself from Australia, attendees came from England, Ireland, Spain, Canada (Quebec), USA, Switzerland and Belgium.

There were a total of 10 attendees for week one and seven of us went on to complete week two - by which time we had all become good friends. We were billited in one of two gítes a few minutes away by car. Interestingly, none of the attendees were strictly microbiologists; professions ranged from veterinary through to general medicine and pharmacy, and bio-engineering for myself.

In addition to the lectures a many printed class notes were made available, together with a copy of the text ***Risk Analysis*** by **David Vose** of David Vose Consultancy. All lectures were delivered by Mr Vose, sometimes informally structured but nevertheless intense. Generally, a communal breakfast at 08.00 was followed promptly by lectures, lunch, a short afternoon tea-break, and lectures or tutorials until 18.30 to 19.00. There was a great disparity in both mathematical and computer skills within the group which ensured plenty of questions and discussion, and being slightly more mathematically minded as a bio-engineer than the average attendee, it resulted in a good pace for me personally.

In week one material on the principles of risk assessment, including managment, communication and modelling basics, was followed with an introduction to important aspects of probability, sampling and stochastic processess. A basic level of skill in Microsoft® Excel was required. In quantifying risk, this software together with *@RISK* (pronounced "at risk") - or other commercially available software such as *Crystal Ball* - is used to build a mathematical risk model that is then used to simulate solutions.

In week two, emphasis was put on increasing the degree of knowlege of modelling techniques, an understanding of uncertainty, an introduction to dose-response modelling and applications to assessment of risk with foods. This used notions familiar to those in Predictive Microbiology. Illustrative applications and working examples were realistic and highly practical. It became very evident that in tackling questions of risks and exposure there is a real need for both a multi-disciplinary understanding and for a specialized, critical input. Team members of such a risk analysis group need to be able to fully communicate as generalists and specialists. However, the most important insight I gained during the course, which I feel sure was shared by my colleagues, was that a shift in thinking is necessary in our own and allied professions. There is no one solution to a problem, but rather a distribution of likely and unlikely outcomes. The practical upshot is that rare events can and do sometimes happen as a matter of course despite the best intentions of the designer or technician. Such rare events are rare and there is often too small a data set for analysis, especially if these rare events are put down to human error. Risk analysis would seem especially important therefore in assembly of bio-statistics for biological and microbiological processes.

Overall I enjoyed this course very much and would recommend it. I would also recommend some prior prepartion in computer skills and a reading of statistics - especially the differences between the classical and the more recent Baysian approaches. I hope to cement the insights and practical skills I gained from the course through applications and refereed publications. I hope risk analysis will be seen to aid the recent momentum in helping the shift in microbiology from a largely qualitative to a more quantitative science.

I am very grateful to *sf*am, and The President's Fund for helping to finance my attendance at this course.

K R (Ken) Davey
University of Adelaide, Australia

Could YOU benefit?

The President's Fund is open to members of all ages.

For further information see the panel on page 44 or visit the website at :

www.sfam.org.uk

Pasteur Institute Lecture

Professor **Pascale Cossart** of the **Pasteur Institute**, Paris presented a Lecture at the John Innes Centre, Norwich, UK entitled ***"The infection by the bacterial pathogen Listeria monocytogenes: from molecular, cellular and genomic data to pathophysiology"***.

The Lecture was attended by approximately 200 delegates from across the Norwich Research Park who heard an excellent summary of her research which was accessible to students and specialists alike. Professor Cossart explained how they have focused on the study of bacterial entry into cultured cells and in the host *in vivo*, on the study of intra- and intercellular movements, of the regulation of virulence gene expression, and on the identification of new virulence genes and on the comparison of the sequences of the genomes of *L. monocytgenes* and *L. innocua.*

Further reading: http://www.pasteur.fr/recherche/RAR/RAR2001/lbc-en.html

Iraquis infiltrated UK germ labs

A scientist has claimed that some of Britain's laboratories were infiltrated by Iraqi scientists in the run-up to the Gulf War. Dr Joseph Selkon, a leading Oxford microbiologist, told BBC Radio 4 that the infiltration was discovered after he became suspicious about one Iraqi research applicant. His suspicions sparked extra security checks, which revealed that leading microbiology laboratories had been targeted by Baghdad.
Further reading:
http://news.bbc.co.uk/1/hi/uk/2483419.stm

We need REVIEWERS!

Would you like to review a book and have your review published in **Microbiologist**? There are a number of books available, a selection of which is detailed below. Please email the Editor of **Microbiologist** at: **a.c.hilton@aston.ac.uk** stating which book you wish to review and in return for your efforts you can keep the book. More titles are being sent to the Society on a regular basis so if there is nothing that grabs your interest in the current selection, email the Editor.

Dictyostelium Evolution, Cell Biology, and the Development of Multicellularity
Richard H. Kessin

***E. coli*, Gene Expression Protocols**
Peter E. Vaillancourt

***E. coli*, Shiga Toxin Methods and Protocols** *Dana Philpott and Frank Ebel*

Essential Fungal Genetics
David Moore, LilyAnn Novak Frazer

Fungi in Bioremediation
G.M. Hadd.

How Scientists Explain Disease
Paul Thagard

Industrial Microbiology, An Introduction *Michael J. Waites, Neil L. Morgan, John S. Rockey and Gary Higton*

Magical Mushrooms, Mischevious MoldsGeorge *W. Hudler*

Medical Microbiology, A Guide to Microbial Infections: Pathogenesis, Immunity, Laboratory Diagnosis and Control *David Greenwood, Richard C.B. Slack and John F. Peutherer*

Notes on Medical Microbiology
Morgan C. Timbury, A. Christine McCartney, Bishan Thakker and Katherine N. Ward

PCR Detection of Microbial Pathogens *Edited by Konrad Sachse and Joachim Frey*

Viral Vectors for Gene Therapy, Methods and Protocols
Curtis A. Machida

Bergey's Manual of Systematic Bacteriology (2001)

Editor-in-Chief: George M. Garrity.
Vo1. 1 edited by David R. Boone and Richard W. Castenholzpp.
721 + xxi ISBN 0-387-98771-1
£ 68.50/$99.00
Berlin: Springer-Verlag
reviewed by Max Sussman

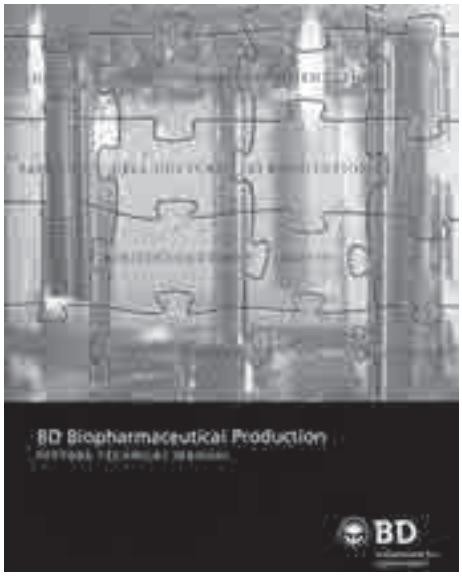
JUST OVER A CENTURY AGO, F D Chester published his *Determinative Bacteriology* (1901), which turned out to be the forerunner of *Bergey's Manual of Determinative Bacteriology.* By the time the first edition of Bergey's *Manual* was published, in 1923, its editors judged Chester's book as "of very little assistance to the student". The one memorable aspect of Chester's pioneering efforts that survived was "Determinative" in the title of Bergey's *Manual*. Finally, even that gesture to memory disappeared in 1984 from the first edition of *Bergey's Manual of Systematic Bacteriology*; though "Determinative" survived in the title of the much shorter 9th edition of *Bergey's Manual of Determinative Bacteriology*. The traditional work had undergone asymmetric fission with the separation of the determinative aspects of Bergey's *Manual* from its systematic sibling.

At first glance, the first and second editions of the determinative *Manual* look reassuringly similar. Readers who find their way quickly, perhaps by way of the index of scientific names, to their chosen genus may notice only whatever advances have taken place in the systematics of the genus during the inter-edition time span. More careful examination reveals a massive transformation; systematic bacteriology has changed for ever. The departure is from the phenotypic classification of old to phylogenetic relatedness based on its objective measurement. This depends on sequence analysis of the 16S RNA of the small ribosomal subunit as derived from the DNA sequence that determines it. The change might well be termed the 'Woese Transformation'.

Happily the changes are reflected in the growth of the introductory chapters from 34 pages in the first edition to 166 pages in the present edition. This is a necessary development to allow a full understanding of the changes that have been wrought. The reading of these generally well-written introductory chapters is essential for the proper understanding and use of the new edition. Garrity and Holt's chapter on "The Road Map to the Manual" is exactly what it says it is and at its end is a helpful alphabetic table of genera with their phyla, classes and their group number as in the 9th edition of *Bergey's Manual of Determinative Bacteriology*. This is followed by a most interesting taxonomic outline in tabular form of the Archaea and bacteria, which shows the order in which the domains, phyla, classes, orders, families and genera will appear when the *Manual* is complete. The final column of the alphabetical table of genera gives the volume number of the *Manual* in which each taxonomic entity will appear when the *Manual* is completed; there are to be another four volumes.

The volume reviewed here contains the systematic account of the whole Domain *Archaea*, which includes the Crenarchaeota and the Euryarchaeota. The burgeoning knowledge about the systematics of the *Archaea* becomes clear from the increase of more than 100 pages devoted to what is now a Domain since the previous edition of the *Manual*. The classification of the *Archaea* is much more detailed than was previously possible and, reassuringly, a number of names persist though not always at their previous taxonomic level. The beginning of the Domain *Bacteria* is represented by Phyla BI to BXIII, which include most notably the themophilic bacteria and the cyanobacteria.

It is a great pity that there is no general index to allow rapid access to the detail and terminology of the introductory chapters. All said, however, though the manual has developed greatly, its standard of excellence remains unchallenged. One looks forward to the appearance of the following volumes.



BD Peptone Technical Manual

B D Diagnosistic Systems

BD Diagnostic Systems has announced the release of the **BD Peptone Technical Manual**, designed to help in the selection of BD bionutrient products for use in cell culture, microbial fermentation production, industrial research, QA/QC and environmental monitoring. Covering a wide range of peptones, the BD Peptone Manual contains sections on Meat Peptones and Media, Casein Peptones and Non-Animal Peptones. Both cell culture and fermentation applications are addressed. Product by product descriptions are provided, with each description containing data on physical, chemical analysis and amino acid distribution, as well as detail on the product's most common applications. Most product pages also display growth curve diagrams, showing how the growth of five common organisms was affected by use of the product.

Further information:
visit http:// www.bd.com.

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Then see the panel on the previous page.

Joint meeting of International Biodeterioration & Biodegradation Society (IBBS) and the International Biodeterioration Research Group (IBRG)

Management & Control of Microorganisms

September 15 - 18, 2003, Manchester Metropolitan University, UK

This international event brings together academia and industry to discuss problems and solutions in the control of microorganisms across a range of processes and environments. In general, each half day session has been planned by one of the two groups. Speakers will outline the range of environments in which undesirable microorganisms are present, the diversity of the microorganisms, and the modes of growth in which they may be found. Novel and existing control methods will also be introduced. Offered papers will supplement the sessions and posters are also welcomed. Presenters will be invited to submit papers to Journal of International Biodeterioration & Biodegradation The meeting will enable workshops, small group meetings and social activities to ensure maximum participation of attendees. It is intended that the conference will prove particularly attractive to young scientists. Funding from FEMS will enable the attendance of a number of such scientists. Two events have been planned with this group of delegates in mind: a poster presentation session coupled with a reception and prizes for the best 3 posters, and a careers workshop. Offered papers will be incorporated into the programme, with parallel sessions as necessary.

The social programme commences on Monday evening with a tour of Manchester and will end with a buffet at a local club/restaurant. The poster session on Tuesday evening will encourage more interaction between presenters and delegates. The careers workshop and conference dinner on Wednesday evening complete the social programme.

Registration Rates

- Students: £100
- IBBS members: £200
- Non IBBS/academic: £300
- IBRG members: £300
- Non IBRG/industry £350
- Day rate £150
- Tour and buffet £35
- Conference dinner £50

For further information, visit:
www.biodeterioration.org/meetings.htm
or email Dr Joanna Verran at:
j.verran@mmu.ac.uk

FEMS Young Scientists Grants are available for this meeting

Deadlines
June 30th for early registration
June 30th for abstracts

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MEMBERSHIP APPLICATION FORM 2002

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If you have any difficulty completing this form please contact the Membership Co-ordinator, Mrs Julie Wright at the Society Office, who will be pleased to help you

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FULL RANGE OF PLATE AND BOTTLED MEDIA

Our comprehensive range of poured plates is prepared under Class 100 conditions in a temperature and humidity controlled environment. We offer a wide variety of volumes and formats to meet all your bottled media requirements - available in batches up to 250 litres.

QUALITY AND PERFORMANCE GUARANTEED

Each batch is performance tested before release and Quality Control Certificates can be provided for all media.

FULLY FLEXIBLE SERVICE

Our flexible ordering service allows you to amend your standing order to meet changing requirements.

For a copy of our ReadyBags information sheet, or for further details of any products from the Oxoid Prepared Media Service contact:

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