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Printed by Dorling Print Limited
GUIDELINES FOR CONTRIBUTORS

These guidelines are intended to assist authors in writing their contributions and to reduce the subsequent editing process. The Magazine Editorial Group is trying to ensure that all articles are written in a journalistic style so that they will have an immediate interest value for a wide readership and will be readable and comprehensible to non-experts. In particular, scientific articles should give a good overview of a field rather than focus on the authors’ own research.

Format of articles
The main message or question posed should be introduced in the first paragraph. The background for the topic should then be established, leading up to the final denouement or conclusion.

Length of articles
This will be determined by the subject matter and agreed between the contributor and the commissioning editor. Articles will vary in length from 200 words to a maximum of 800 words.

Submission of articles
Authors should submit text in the form of a disk accompanied by a printout wherever possible. Use of disks reduces the risk of introduction of errors during re-typing. It is helpful to give brief details of the computer, operating system and software package(s) used (DOS formatted Wordperfect 5.1 files preferred, but not essential).

Deadlines for submission
See Notable Dates (inside covers of 1995 edition of the Grey Book) or contact the Editorial & Production Office. Late submissions will not be accepted or publication will be deferred to a later issue.

Illustrations
Authors are encouraged to submit diagrams, drawings, photographs or other artwork to illustrate their articles or, if they cannot provide these themselves, to suggest what artwork might be appropriate. Photographs may be colour or black & white, prints or transparencies.

Author photographs
The Magazine normally includes photographs of the authors of articles. These may be colour or black & white; prints are preferable if cropping is required.

References
Authors are requested to keep the number of references to a minimum (preferably no more than two or three).

Suggestions for articles
These should be made (in writing, by phone, or in person at Scientific Meetings) either to the Editor, to the Editorial Assistant or to the relevant member of the Magazine Editorial Group (see left).
KING'S COLLEGE LONDON MEETING:
REGISTRATION

Persons planning to attend the Scientific Meeting on 18-20 December 1995 at King's College London are asked to note that, on this occasion only, the registration and booking forms should be sent to the Society's Administration Office in Oxford, not to the host department.

Photography by Martin Rosenberg
SO WHO SHOULD BE ON THE COMMITTEE?

The Committee of The Physiological Society is responsible for the running of the Society and, in law, has the same responsibilities and status as a Board of Directors in a company. There are three types of Committee members: ex officio, Ordinary and Designated. It is easy to understand why the ex officio members are on the Committee; these ex officio members are: the Treasurer, the three Secretaries, the Chairman and the Secretary of the Editorial Board of The Journal of Physiology and the Chairman of the Editorial Board of Experimental Physiology. Members of the Society seem to have more difficulty understanding the other two categories.

There are 13 Ordinary members of the Committee - serving for a maximum of four years - which is designed to give an overall majority. Of these 13, not more than ten can be proposed for re-election and the longest serving members retire. This means that there are three or four new Ordinary Committee members each year. The nominations for these vacancies can be made either by the Committee or by the membership at large, and over recent years the Committee has deliberately nominated fewer candidates than there are vacancies, so that at least one member proposed by the general Membership is elected. While it is not possible to state the reasons that Ordinary Members choose their nominees, Committee nominees are used to try and ensure that the Committee for the following year is broadly based with regard to geography, subject specialisation, gender, age and seniority. To take a wild example - it might not be wise to have a committee composed of male transport physiologists from Manchester! (It may, of course, be eminently sensible, but unlikely.) Last year, retirements meant that there would have been no one on this new Committee who was engaged in clinical work, and the Committee used its nomination to plug the gap. However, the people are elected by ballot and the Annual General Meeting decides on the success, or otherwise, of the nomination.

One other consideration is very important. Successful candidates have to be prepared to give their time to benefit the Society. This is not a trivial matter. There are 5-6 Committee meetings a year and each member will be on one or more sub-committees, each of which generates its own work, much of which has to be done by the members. Committee members are also expected to play an active part in Scientific Meetings.

There seems to be even more mystique about Designated members of the Committee. Nine posts are designated - the Chairpersons of the Publications, Education & Information, Ethics, Animal Welfare and Grants Sub-Committees; the Archivist; the Editor of the Magazine; the Academic Supervisor of the Administration Office; the Secretary of the Editorial Board of Experimental Physiology. Of these nine, up to five can be nominated by the Committee as Designated members. Usually they are people who have already been elected as Ordinary members and have moved on to another post (but complicated rules ensure that this cannot be used as a device for ensuring long term membership of the Committee).

So, as can be seen, the Committee is a complex animal. It is responsible for a small-to-medium size business, with a turnover of more than £2m and important to all Members. If you have comments about the constitutional make-up, views, for example, on the number of Designated members or any other thoughts, please contact the Chairman.

Roger Green
Chairman of the Committee
School of Biological Sciences
University of Manchester

NOMINATIONS FOR NEW COMMITTEE MEMBERS

The Committee will soon be considering its nominations for the elections at the 1996 AGM. Any Member who would like the Committee to consider an individual for nomination should write in confidence to the Committee Secretary, The Physiological Society, PO Box 506, Oxford OX1 3XE by the end of December 1995.

Nominations for Ordinary membership of the Committee can also be made, with the agreement of the nominee, by five Members of the Society. These nominations should be sent to reach the Committee Secretary by 4 April 1996. It is the Committee's policy to make fewer nominations than the number of vacancies arising and it hopes that Members will ensure that there is a reasonable field of candidates proposed.

Phil Harrison, who has been an Ordinary member of the Committee since July 1994, has agreed to be nominated for election to the office of Honorary Treasurer at next year's AGM. Phil has the an unusual qualification for
this position in that he has degrees in both Law and Physiology. Peter Stanfield, newly elected onto the Committee as an Ordinary member at the 1995 AGM, has agreed to be nominated for election to the office of Committee Secretary. Peter served on the Committee from 1985 to 1990 and as an Editor of The Journal of Physiology from 1980 to 1988, including a period as a Distributing Editor.

THE GLAXO PRIZE FOR PHYSIOLOGY

The Oxford Meeting of The Physiological Society saw the first competition for the Glaxo Prize for Gastrointestinal Physiology. The Prize was won by Dr David T Thwaites of the University of Newcastle for his Communication "Distinct H+ coupled solute transporters are expressed at the brush-border of human intestinal epithelial (Caco-2) cells". Dr Thwaites' Communication was one of three excellent Communications nominated for the first Glaxo Prize for Physiology. The two runners up were Dr Andrew Higham from the University of Liverpool and Dr Vivien Rolfe from the University of Sheffield.

The Glaxo Prize for Physiology is supported by Glaxo Research & Development Ltd, UK, and is given in recognition of the outstanding contributions made by young investigators in the field of Physiology. The Prize is awarded on the basis of a Communication of work in the field of gastrointestinal research. Work from other fields, however, which are deemed likely to contribute to the further understanding of gastrointestinal physiology, can also be nominated for a Glaxo Prize. The Prize is awarded on the content and quality of the Communication given at the Designated Session at a Physiological Society Meeting. The Prize is aimed at postdoctoral researchers who are within five years of their doctoral degree.

Dr Thwaites received a cheque for £500 and an engraved Edinburgh crystal bowl for his successful Communication for the Glaxo Prize. The Prize was awarded at the Cork Meeting of the Society by the director of Glaxo, Dr Malcolm Thomas.

Instructions for nominations for the Glaxo Prize can be obtained from Dr David Grundy, University of Sheffield or from the Administration Office.

David Grundy

1996 MEMBERSHIP SUBSCRIPTIONS AND REDUCTIONS

The subscription rates, which are the same for 1996 as they were for 1995 and 1994, are set out in the Notice of Annual Subscriptions circulated with the papers for the King's College London Meeting. The Notice also gives details of acceptable methods of payment.

Any Member who wishes to stop or resume receiving The Journal of Physiology and/or precirculated Abstracts and any Member who has retired during 1995 should inform the Administration Office immediately, so that mailing lists and subscription records can be amended in time. There is no need for cancellation of your direct debiting instruction if your subscription rate is about to change: the amount collected from your bank account will be amended automatically. If you wish to check the amount to be collected or to check that your direct debiting instruction is still in place, please contact the Administration Office, tel (01865) 798498, fax (01865) 798092, international dialling code +44 865, Email admin@physoc.org

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For further information, please contact Sue Venables, Senior Administrative Officer, The Ciba Foundation, 41 Portland Place, London WIN 4BN, tel (0171) 636 9456, fax (0171) 436 2840.

University of Cambridge
Dept of Physiology
The Cork Meeting

The highlight of the Group at the Cork Meeting (20 - 22 September) was our Designated Lecturer - Professor Orville Smith from the Department of Physiology & Biophysics, University of Washington, Seattle, USA.

Professor Smith talked on the "Neural Behavioural Regulation of Cardiovascular Responses in Social Groups of Baboons", revealing the patterns of visceral responses, recorded using telemetry, that accompany different stereotype behaviours. His lecture was illustrated by a fascinating video showing the "social" interactions between a dominant male, a subordinate male and two females, while simultaneously displaying a range of cardiovascular variables. What was intriguing was that the anticipatory visceral responses were of greater magnitude than the ones occurring during the motor act. A good recipe for neurogenic hypertension! Indeed, parallels were made with human behaviour and this was emphasised by Professor Smith when he proudly showed us a slide of his version of "When Harry met Sally"! I sincerely hope that Professor Smith's unique approach will quench his desire to unravel the function of paraventricular hypothalamic neurones. All told, it was a most entertaining and stimulating lecture which generated some fascinating discussion.

In addition to Professor Smith's lecture, our Group made a substantial contribution to the Cork Meeting, with 18 Oral Communications, 13 Posters and one strange Illustrated Communication. Compared to the last meeting of the Group at Oxford, seven more presentations were made.

I would like now to draw your attention towards the next meeting of the Group, which looks to be most interesting. First, we are honoured that Professor Michael de Burgh Daly will give the Designated Lecture at the University College London Meeting (16-18 April 1996). His title is "Respiratory Modulation of Cardiovascular Reflexes".

Second, on Friday 19 April we are holding the first Cardiovascular and Respiratory Control Special Interest Group symposium entitled "Neural Aspects of Cardiovascular and Respiratory Regulation".

The programme will include three sessions with two speakers per session:

- Anatomical Considerations and Reflex Control (Professors A D Loewy & J M Marshall)
- Rhythm Generation (Professor D W Richter & Dr J C Smith)
- Cardiovascular Motor Control (Drs M P Gilbey & D C Randall)

Details of lecture titles will be forthcoming in the next Special Interest Group Forum and in advertisements. Dates for submission of abstracts for the UCL Meeting are 5-18 January 1996.

Julian Paton

The Oxford Meeting

As all of you who have attended the Sessions will know, Cellular Neurophysiology continues to be a well attended, lively Group. At the Oxford Meeting we had one and a half days of Communications, including a successful Pfizer Prize candidate presentation by Andrew Boxall (congratulations!) and seven Poster Communications.

Although the Posters were well attended, the acceptance of Posters was attended by few Members and even fewer authors! If you want yours accepted for publication, you must attend this session, or change the rules of the Society. Opinions so far voiced range from the view that it is pointless even trying to organise a formal acceptance of Posters to the view that no Communication should be published without the formal agreement of Members of the Society. As things stand, Poster Communications can only be presented in association with a Special Interest Group Session. If you have any views on Poster acceptance let me know. For example, should the decision be made at the Poster session rather than in a lecture theatre on the other side of the road?
At the King’s Meeting, we will have another full day of Communications. In 1996, we are scheduled for three Sessions, at University College London in April, Edinburgh in July and Leeds in September. If you would like me to arrange events in association with these Sessions, special guest lectures, symposia or social events, let me know.

Alex Thomson
Tel (0171) 830 2833
Fax (0171) 433 1921
Email alext@rflism.ac.uk

EPITHELIA & MEMBRANE TRANSPORT

The Cork Meeting

The Physiological Society Meeting at Cork was preceded by a symposium called “Ion Channels in Health and Disease”, and paralleled by meetings of the Ion Channels and Renal Physiology Special Interest Groups. This ensured a healthy attendance at the Meeting, and also meant that those of us interested in ion transport across renal epithelia were kept quite busy, and frequently needed to resort to third party reports. Work ranged from whole organism studies to the molecular and included 36 Oral and 28 Poster Communications, plus a Designated Lecture. While our days were filled with erudition, the evenings turned to the equally appealing attractions of Cork, which boasts in excess of 20 pubs for a population of 140,000. For our part, the Leeds contingent, with help from our colleagues from the North East, did our best to sample sufficient Murphys, Beamish and Guinness stouts to enable a statistically meaningful comparison of their respective qualities, but soon realised that double-blind trials take on a completely new meaning under such demanding conditions.

The Designated Lecture was given by Professor David Dawson of Ann Arbor, Michigan, and concerned the coupling between the Na/H exchanger and the proton conductance, these two transport events represented movement through the same molecule, albeit operating in a different mode, just as it was proposed that the Na/K pump and K leak pathway of red cells may also be one and the same protein. However, due to some excellent detective work, the idea for which Professor Dawson magnanimously attributed to Sergio Grinstein, who incidentally was the lecturer designated at the King’s College Meeting in December 1993, he revealed that these two transport mechanisms (the proton conductance and the Na/H exchanger) were indeed separate and that coupling between them was mediated by localised changes in intracellular pH. The lecture was delivered with such expert dexterity and clarity, and with a wry sense of humour, that it was warmly received by all who were lucky enough to have attended.

The symposium attracted many people from continental Europe who were not invited speakers - notably from Denmark, Belgium and France. Several of these people remarked upon the excellence of the Meeting and talked of attending on a regular basis. I suspect this is the product of the Special Interest Groups, and may apply particularly to Meetings which include Groups with overlapping interests. The injection of new thoughts and ideas is most welcome to the Group and, far from inhibiting discussion, seemed to promote a much more relaxed environment, which proved conducive to constructive scientific discourse. Perhaps we could consider extending the Young Physiologists Guest Scheme to our European colleagues to encourage such contacts further?

As well as being an excellent host, Brian Harvey certainly deserves our thanks, on behalf of the Epithelial & Membrane Transport Group, for gathering together such an august set of speakers and, in so doing, providing the backdrop for a very lively and productive EMT Group meeting.

Malcolm Hunter
**Future Meeting: Manchester, 25-27 March 1996**

"Molecular Physiology of Membrane Transport Proteins" is the theme chosen for this Meeting being organised by Peter Bown, Maynard Case and Roger Green. The Meeting, including the Epithelial Transport Club, will run from around lunchtime on the Monday to lunchtime on the Wednesday. It will consist of the usual free Communications, both Oral and Poster, interspersed with key note lectures, following similar lines to the Designated Meeting held in Newcastle in November 1994.

At the time of going to press, the following key note speakers had indicated their intention to participate in the Meeting.

- **Walter Boron (Yale, New Haven, USA):** Apical Permeability Barriers in Gastric and Colonic Epithelia.
- **Steve Karlish (Rehovot, Israel):** Organisation of the Membrane Domain of the Na/K-pump.
- **Mike Kavanaugh (Portland, USA):** Flux of Glutamate and Chloride Mediated by Cloned Transporters from Kidney, Intestine and Brain.
- **Soren Nielsen (Aarhus, Denmark):** Aquaporin Water Channels in Kidney: Expression and Regulation.
- **Yasunobu Okabe (Okasaki, Japan):** P-glycoprotein is Neither a Channel nor a C-kinase Mediated Channel Regulator.
- **Craig Smith (Bethesda, USA & Manchester):** The Molecular Physiology of Urea Transporters.

Please note that the dates for receipt of abstracts at the Meetings Secretary’s Office are 15-28 November 1995.

**GASTROINTESTINAL TRACT**

**The Oxford Meeting**

The Gastrointestinal Tract Designated Session at Oxford occupied a full day of Communications, Posters and Designated Lectures. The latter were jointly organised with the Autonomic Functions Special Interest Group, which gave us the chance to set aside part of the Meeting specifically to address autonomic control of the gastrointestinal tract: a theme that was developed in a number of Communications during the course of the day. Combining forces with the Autonomic Functions Group also enabled us to offer two Designated Lectures, although a glitch in the administration almost meant that neither was included in the Programme. The Designated GI chairman only managed to avoid serious “egg on face” by a chance telephone call to the Administration Office on the final day before the programme went to press.

Joe Szurszewski, from the Department of Physiology and Biophysics at the Mayo Medical School in Rochester, Minnesota, gave a Designated Lecture on the intrinsic nervous system of the mammalian pancreas. There has been relatively little work on enteric neural control of the endocrine pancreas and Joe’s laboratory has been breaking new ground in this area. A brief outline of his talk is included in this issue.

Professor Peter Holzer, from the Department of Experimental and Clinical Pharmacology at the University of Graz, discussed the role of peptidergic afferent neurones in the GI tract. This area of research encompasses gut inflammation and the role of visceral afferents in mucosal protection, both currently hot topics (also see associated article).

As usual, the Oral Communications and Posters were varied, encompassing many aspects of gut function and, following a tradition of recent GI Tract Designated Sessions, Hellewell, Boyd and Bronk presented their work on dipeptide transport in the perfused lung. Other Communications focused on enterocyte transport, muscle contraction, visceral blood flow and gut endocrine system. A diversity of research approaches were presented, from whole animal physiology through to isolated cell patches and membrane vesicles, employing a variety of techniques including patch clamp electrophysiology, immunocytochemistry and molecular biology.
David Thwaites from the University of Newcastle won the Glaxo Prize for his work on H+ coupled solute transporters in brush borders of human intestinal epithelial cells, which he had studied using radio labelled dipeptides and pH sensitive fluorescent dyes.

The assessment panel for the Glaxo Prize were also considerably impressed by the two runners up who both gave excellent presentations. Andrew Higham’s Communication was on the mechanisms underlying the postprandial release of gastrin, which he had investigated using techniques to ablate the antral enteric innervation. His data demonstrated plasticity in the innervation of the G cell with the role of gastrin releasing peptide (GRP) being superseded by up regulation of an alternative mechanism after neuronal ablation. Vivien Rolfe had investigated the involvement of C fibre afferents in the stimulation of jejunal secretion by the enterotoxin E coli STa applied to an isolated segment of ileum, which she demonstrated involving a vagal reflex incorporating nitric oxide as one of the mediators.

Feedback on Designated Lectures, Posters and Communication Sessions was extremely positive, although I was disappointed that the “parallel” Meeting with the British Pharmacological Society didn’t really facilitate exchange between the two groups, with GI sessions running in parallel.

The next Designated Session will be at the Edinburgh Meeting in July 1996 and then in Sheffield 1997. If you, or any of your colleagues, would be interested in joining the group (Members and non-Members) or if you have any suggestions for themes and invited speakers, nominations for prizes etc, please contact me (fax (0114) 278 901, tel (0114) 282 4657, Email d.grundy@sheffield.ac.uk).

David Grundy

ION CHANNELS

The Cork Meeting

At the Meeting in Cork there was considerable ion channel activity: sometimes the apparent Popen exceeded unity, such as on Wednesday when the second day of the symposium on Ion Transport in Health and Disease vied for attention with the Ion Channels Posters and a number of Communications with a strong channel flavour in the Cellular Neurophysiology Designated Session. On Thursday morning, and all day Friday, Communications in the Ion Channels Designated Sessions continued. For those who had their laptop computers connected to the World Wide Web, the Ion Channels in Health and Disease symposium was “mirrored” as a virtual symposium on the internet at http://www.core.co.uk/core and will be indexed at the Bioscience Digest Web Site for future reference. The symposium drew

HUMAN PHYSIOLOGY

Provisional Symposium Programme
CONTROL OF TISSUE BLOOD FLOW AND METABOLISM
Wednesday 20 December 1995
King’s College London

| Blood Flow and Metabolism in Cardiac and Skeletal Muscle | Dr J Bulow, Copenhagen |
| Blood Flow and Metabolism in the Splanchnic Region | Dr T Brundin, Stockholm |
| Blood Flow and Metabolism in Adipose Tissue | Dr K Frayn, Oxford |
| Does Blood Flow Regulate Metabolism? | Prof M J Rennie, Dundee |
| Blood Flow and Metabolism in Obesity & Diabetes | Prof I A Macdonald, Nottingham |
| Morphological & Functional Changes in Hypertension | Prof A Heagerty, Manchester |
| Regional Blood Flow and the Metabolic Response to Exercise | Prof B Stalin, Copenhagen |
participants and speakers from throughout the world. Many thanks to Brian Harvey and his team for their time and effort involved in organising this.

The popularity of this symposium no doubt contributed to the large number of Ion Channels Communications and Posters and was probably an equal attraction for participants in the Renal Physiology and Epithelia & Membrane Transport Sessions.

The Ion Channels Designated Lecture at this Meeting was given by Professor Kevin Foskett who, after talking in the symposium on Tuesday, gave his Designated Lecture on Thursday on endoplasmic reticulum ion channels in health and disease. This talk included a fascinating account of patch clamping the nuclear envelope of both Xenopus oocytes and mammalian cell lines to study channels in the endoplasmic reticulum and was a talking point of the Meeting.

The variety of ion channels featured these days at Society Meetings is a wonder to behold and the Cork Meeting was no exception. K+ channels, as usual, were predominant in both variety and number of Communications, although, of course, they hardly compare, for example, with the elegance and nobility of an NMDA receptor in full flow! The results of collaborations between physiologists and molecular biologists appeared in 19 out of 63 Communications and Posters in the Ion Channels Sessions illustrating how widespread molecular genetic techniques have become in ion channel research.

Another feature of the Meeting was the number of Communications given by PhD students, many of whom attended the Meeting under the Young Physiologists Guest Scheme: a definite success in encouraging young physiologists to attend Meetings.

Also for the benefit of Young Physiologists, two Pfizer Prizes were awarded at the Meeting for Communications given in the Ion Channel Sessions by Amanda MacKenzie and David McHugh. Well done, Amanda and David!

Pfizer were represented at the Meeting by Dr Derek Leishman, who presented Pfizer prizes at the official dinner to Andrew Boxall and Andreas Floto for their Communications given at the Oxford Meeting.

Overall, this was a sparkling Meeting of The Physiological Society, carried along by the warmth and good humour of the Irish people in Cork. The Irish are obviously keen on ion channels and if the UCL Meeting was misspelt UCC, no one who was in Cork would be unhappy! Our next Designated Ion Channels Sessions are at King's College London in December, at UCL in April and at Edinburgh in July. Suggestions for ideas for future Meetings are always welcome.

Andrew Boxall, Pfizer prizewinner, being presented with a cheque by Derek Leishman of Pfizer while John Hall, Head of the Department of Physiology at Cork looks on. Andreas Floto, Pfizer prizewinner, receives his cheque.

Noel Davies
Alasdair Gibb

MICROVAScULAR & ENDOTHELIAL PHYSIOLOGY

The programme for the joint Microvascular & Endothelial Physiology and Smooth Muscle symposium at King's College London, 18-19 December, has now been finalised (see box, over page). In addition to the seven keynote lectures, the symposium has attracted many interesting abstracts on oxidative stress from colleagues in the UK and Europe.

We have managed to include 26 Oral Communications in the symposium, which begins at 9.00 am on 18 December. Approximately 35 Posters are scheduled for a “working” Poster lunch from 12.30 to 2.30 pm on Monday 18 December. The symposium finishes at 3.00 pm on Tuesday 19 December and is then followed by Demonstrations and the Halliburton Lecture from Professor Salvador Moncada, FRS.

An extended Microvascular & Endothelial Special Interest Group Session is scheduled for the morning of Wednesday, 20 December (see the King's College Programme).

I look forward to seeing you at King's. Should you require any further information, please contact me on (0171) 333 4450 (direct line).

Giovanni Mann
The Microvascular & Endothelial Physiology and Smooth Muscle Special Interest Groups of The Physiological Society are co-ordinating this symposium, which intends to review the effects of reactive oxygen intermediates on cell signalling in endothelial and smooth muscle cells in vitro and in vivo. The symposium is scheduled for one and a half days and the programme is as follows:

<table>
<thead>
<tr>
<th>Lecturer</th>
<th>Topic</th>
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<tbody>
<tr>
<td>H Sies (Duffeldorf)</td>
<td>Oxidative stress: oxidants and antioxidants</td>
</tr>
<tr>
<td>K Brand (Munchen)</td>
<td>Role of NF-KB in the pathogenesis of atherosclerosis</td>
</tr>
<tr>
<td>V Darley-Usmar (Alabama)</td>
<td>Nitric oxide and oxygen dependent disruption of signalling pathways in cardiovascular disease</td>
</tr>
<tr>
<td>R Plevin (Strathclyde)</td>
<td>Hypoxia and endothelial cell signalling pathways</td>
</tr>
<tr>
<td>R Bucala (New York)</td>
<td>Advanced glycosylation end products in diabetic and non-diabetic vascular disease</td>
</tr>
<tr>
<td>P Weissberg (Cambridge)</td>
<td>Smooth muscle cell proliferation</td>
</tr>
<tr>
<td>P Kubes (Calgary)</td>
<td>A delicate balance between nitric oxide and oxidants regulates leukocyte-endothelial cell interactions in vivo</td>
</tr>
</tbody>
</table>

We aim to integrate these invited lectures (30-40 minutes) with free communications and posters. If members of the above Special Interest Groups require any further information, please telephone one of the following:

Dr Giovanni Mann (0171) 333 4450
Professor Lucilla Poston (0171) 928 9292 Ext 8328
Dr Jeremy Ward (0171) 928 9292 Ext 8008

The science, too, was very satisfying. After registration and coffee, during which we could start to look at the Posters, Professor Gareth Leng gave a bravura presentation on the origins and significance of patterning in hormone secretion. He started by considering the neurohypophyseal system and then discussed the release of gonadotrophins, showing us how the patterns could be modelled mathematically. Lunch followed and an opportunity to look at a few more of the Posters, 20 submitted to The Physiological Society and an additional 19 to the BNG. The afternoon session commenced with a symposium on Pituitary Regulation chaired by Professor Scanlon. Professor Jacques Epelbaum, opening the session, presented us with a model of the organisation of intrahypothalamic neuronal circuits underlying the ultradian growth hormone pulsatility. Professor Iain Robinson took up the theme of the neuroendocrine regulation of
growth hormone secretion, demonstrating that not only is the amount and pattern of growth hormone secretion regulated by the neuroendocrine hypothalamus, but also the responsiveness of peripheral target tissues. There was the “double act” from Dr Zhen-Ping Chen and Professor Stafford Lightman who proposed that, in addition to the established role of ATP in intracellular metabolism, the nucleotide could have a role in regulating pituitary function, in particular that of the gonadotrophs. The final presentation by Dr Steve Davies was in a similar vein, being devoted to the role of adenosine and related nucleotides as growth factors within the pituitary. After tea was a session of free Communications chaired by Dr Ilam, in which the control of growth hormone and LH secretion was discussed; also the regulatory effects on pituitary function of hormones, including melatonin and glucocorticoids. The audience then adjourned for sherry and a chance to browse through and discuss the Posters. After the approval of Posters chaired by the convenor, there was an excellent dinner in the University Staff Club.

The next meetings of the Group will be at the Designated Meeting at Manchester (26-27 March 1996; abstract submission dates 15-28 November 1995) and the Meeting at Leeds (11-13 September 1996; abstract submission dates 17-30 May 1996).

Dave Potts
I would encourage anyone with an interest in sensory functions to submit an abstract for this Meeting, to ensure that what promises to be an excellent lecture is complemented by a wide spread of Oral and Poster Communications. The dates for receipt of abstracts are 5-18 January 1996.

Melvin Goodale

Future Meeting: Edinburgh, July 1996

Sue Fleetwood-Walker, Alan Brown and Arthur Duggan have organised a symposium on "Interactions in spinal somatosensory processing pathways" which is to be sponsored in part by the Group. It will run the day before the official Meeting and aims to review aspects of the functional interactions which occur in somatosensory processing in the spinal cord. The main topics of discussion will be:

- pathways to the brain
- chemical transmitters and modulators
- intracellular mediators
- gene expression

The talks will deal with neurotransmission in normal and in certain pathophysiological conditions. The importance of the interactions to be addressed lies in the way in which these processes form a basis for "fine tuning" of somatosensory transmission, and the synaptic plasticity that underlies pathological hyperalgesia. The symposium will focus on interactions at the level of chemical signals and agents, which are the foundations for adaptive changes in physiological systems. The speakers draw on a wide range of expertise in the field and will provide a broad perspective on this very important topic. They will be Alan Brown, Arthur Duggan, Max Headley, M R Young, Steve Thompson, P Heppenstall, Terence Coderre, Hans-Georg Schaible, Manfred Zimmerman and Zsuzsanna Wiesenfeld-Hallin. There will also be a normal Designated Session during the Meeting proper. The closing date for abstracts for this Meeting is 14 March 1996.

See you at King's.

Rob Clarke

Future Meeting: UCL, April 1996

The Group will be co-hosting the Paton History of Physiology lecture to be given by Pat Wall. There will be a regular Designated Session to boot. The closing date for abstracts for this Meeting is 18 January 1996.

A Cork Time Slip
Dear Readers,

It's that silly season again. Turkey, chipolatas, pale giblet-stock gravy and over-rich "pud" - all washed down with the ingredients for liver damage and adorned with paper hats and silly jokes from the crackers. By the time one's sent out dozens of charity cards, spent hundreds of pounds on presents, and done the family rounds, it's enough to knock the stuffing out of any bird: chestnut or not. So, please all look forward to a happy festive season and make sure there are some good resolutions for the New Year.

We have had a great response from our Media Questionnaire which was sent out in October. Lots of positive comments and lots of enthusiastic physiologists who are prepared to comment on various issues to the media. However, the larger the data base the more effective it will be. So, if you haven't returned your questionnaire because of an oversight (or over work), shuffle through your in-tray and return your reply. I'll take them as a stocking filler rather than the tangerine in the toe and walnuts in the heel.

Over the past year the Magazine Sub-committee has been trying to push the Society and physiology, in general, into the limelight of the media. We have been making some progress. In late September, physiologists from Bristol met with local radio and television producers and various journalists at an evening Soiree. The physiologists presented what they could offer to the media and the media representatives responded with positive enthusiasm. Another "do" will be held in London in January. The object is to form closer links with the media.

At the same time I am receiving an increasing number of calls from the 'media' to obtain expert advice from physiologists. Such enquiries range from the BBC to women's magazines and most of these enquiries want a physiological "slant" or "basis" to some topic - for example, famine, fatigue, cardiovascular disease, premenstrual tension, body rhythms and so forth. We are now beginning to get the information, to point them in the right direction and, hopefully, to promote physiology. With the questionnaire I have also had many suggestions for articles which I will not only take up for the Magazine but also for the press. Thank you to all those who have supported this initiative. This time of year it is appropriate to thank everyone who works so hard for the Magazine. Members of the Magazine Sub-Committee commission articles, write articles, edit, provide new ideas, suggest improvements and generally support the whole production. Their work is invaluable and must be recognised. The logistics of ever "going to press" depend on the hard work of Deborah Paul, Jane Ault, Heather Dalitz and Jacqueline King. They edit, proof read, badger authors of late submissions, type up articles that are not submitted on disc, collate, do the desk-top publishing and finally send everything off to the printers. This is all fitted in on a part-time basis.

As Editor, I receive many comments about the Magazine - mainly positive, a few negative. But that does not lead to complacency, so any comments, complaints, or suggestions for improvement are always welcome. (They may be sent anonymously!). Also, I am always keen to receive suggestions for articles (it's difficult to keep abreast of the entire Physiological Society community), so if you feel your field of research is being under-represented or you have something to communicate that will be of interest to physiologists, then please get in touch.

In the meantime, seasons greetings and all that goes with it.

Saffron Whitehead

The Din at Dinners

Dear Editor,

At the Meeting of the Society at Cork the dinner was spoiled by rowdiness when speakers were on their feet. Several senior members of the Society were incensed enough about this to ask me to do something about it (since I was in the annexe I was not personally aware of the problem). This is the second meeting in succession where similar problems have been encountered and it was ironic that the Meetings Secretary's comments on the noise at the Oxford meeting were drowned out at the Cork meeting.

At many of the meetings we have influential guests - at Cork there were several senior figures from Physiology overseas as well as the Junior Education Minister. I have already apologised to the host department on the Societies behalf, but I do not wish to have to do so again. Can I remind members and guests...
that common courtesy should be enough to keep people quiet while speakers are on their feet. Also, that members are responsible for their guests.

I realise that there may need to be a debate about the place of speeches at dinner, some people feel it would be better to dispense with them, while others feel it is part of a tradition which ought to be retained.

I would also accept that some of the public address systems we have used are less than ideal, and while we will try to deal with that problem this does not excuse the rowdy behaviour. If this continues we will have to consider what further steps are necessary to prevent a recurrence.

Roger Green Committee Chairman

T P Feng

Dear Editor

In response to the request I made in the last issue of the Magazine that I would like to hear from anyone who knew Professor T P Feng (he died in April this year), I had one very prompt reply, and that was from Professor D K Hill. With his kind permission, I give below selected parts from his letter: I am sure they would be of interest to the members.

"You say that you would like to hear from Members of the Society who knew him. I was one, and although aged only fifteen when he arrived at my father’s laboratory in 1930, I saw him quite often. He was regularly invited to join our family circle, and we greatly enjoyed his company both in London and at our holiday home in Devon during the period he worked at the Marine Laboratory in Plymouth. He would produce the strangest of gifts to amuse us, such as Chinese chickens’ eggs which had been in the ground for 50 years, and when opened looked jet black, very tasty."

"TP (as his friends called him), or Tay Pay as he liked to remind us his initials were pronounced in his own language, returned to China in 1934. Since then I must have met him from time to time when he was over here, but the only two occasions I can now recall were, first, about 1965 when he visited me at Hammersmith (I subsequently arranged to have dispatched to him in China some items of equipment and chemicals. I never received any acknowledgement, but knowing what a courteous person TP was, I concluded that the political regime in China - the "Cultural Revolution" was then at its worst - had somehow blocked his links with the west). The last time..."

"I never knew much, if anything, about TP’s personal life and circumstance in China. His exact date of birth appears to be unknown by western friends. I can only tell you that my father in one of his reminiscences wrote it as 1905."

"Photographs on the dust jacket of AV Hill’s "Trails and Trials in Physiology" (1965) include one, a little indistinct, taken in 1930 on the roof of the lab at UCL, with the legend ‘Seven nations at University College London (1930), R Margaria (Italy), Hill (England), B Sen (India), T Teorell (Sweden), E Kreps (USSR), A Grollman (USA), T P Feng (China).’ For TP too, science knew no national boundaries."

"TP’s command of the English language was perfect, even as a young man. But more that, he had the rare gift of being able to express himself in a delightfully felicitous style. Altogether a lovely and memorable person."

Professor Hill also provided me with a valuable reference (T P Feng (1988). Looking Back, Looking Forward. Ann Rev. Neurosci., 11: 1-12), which contains some reminiscences of Professor Feng's professional career. The following few sentences were taken from this paper by T P Feng.

"Robert Lim, my old teacher in Peking Union Medical College made arrangements for me to go to University College London to work with A V Hill. I was unaware what Lim had written to Hill about me, but in the spring of 1930 I received a brief letter from A V Hill saying “If you are as good as Lim says you are, come along”.... I arrived in London in September 1930. I saw A V Hill for the first time while he was doing some work with his assistant, J L Parkinson, in his laboratory. My first impression of Hill was that he was rather austere, but I soon felt more at ease when I saw a galvanometer in his laboratory labelled conspicuously, “Danger 1000 OHMS”!!"

The above paper by Feng is well worth reading, especially if you are interested in learning about the ‘life in physiological laboratories’ > 60 years ago. I hope the next Muscle Contraction session at Oxford will be a success, and that members will support the session at King’s College London on 18-20 December.

K W Ranatunga
Dear Editor

I was pleased to read the article entitled 'Informed Consent in Human Experimentation' by Dr Philip Harrison. Many of the problems associated with this kind of work were addressed, but the central question any researcher should ask is "Do I need to obtain the consent of my local Ethics Committee?". The answer, in my view, is emphatically yes, even when the risk appears slight. Research staff should also read some of the relevant guidelines. The publication 'Research on Healthy Volunteers' produced by the Royal College of Physicians is particularly helpful. So too are some recent publications on the role of Ethics Committee - I especially like 'Ethics and Health Care' written by Julia Neuberger for the Kings Fund Institute.

Researchers should bear in mind that what is considered ethical in this and other fields of human endeavour is constantly being re-defined and local Ethics Committees are the only bodies constantly reviewing the standards required of those whose work involves access to human volunteers, both sick and healthy.

John B Harris

John Jefferys has been appointed Professor of Neuroscience in the Department of Physiology at the University of Birmingham. His main interests concern emergent properties of neuronal (mainly hippocampal) networks, such as epileptic activity or fast rhythmic "gamma" EEGs that have been linked with cognition. This work on "neuronal networks" differs from that on more abstract "neural networks" in its concern with the details of the cellular electrophysiology of real neurons, their synapses and their connectivity. The experimental work often is closely linked with computer simulations by Roger Traub (IBM, Yorktown Heights). The move to the Birmingham campus provides new opportunities to develop this approach through links with colleagues in clinical neuroscience, physics and mathematics, as well as basic medical sciences.

John trained in Physiology at University College London, completing his PhD with Tony Gardner-Medwin in 1977. He held posts at the Royal Free Hospital (with P. K. Thomas), the Institute of Neurology (with T. Sears), and for the last nine years in Charles Michel's department at St Mary's Hospital Medical School (now Imperial College), where he was a Wellcome Senior Lecturer and recently was awarded a personal Chair in Neurophysiology.

Birmingham has several attractions, not least that it appears less prone to reorganisation than the London Medical Schools. Its main disadvantage is its distance from the coast, which makes John's hobby of SCUBA diving more difficult. Luckily, another close colleague, Mike Gutnick, works in Israel, and organisers of hippocampal and epilepsy conferences now seem to prefer warmer coastlines. John's family shares his enthusiasm for warm seas and his two young daughters show great promise as snorklers and fish watchers.

What a waste: Stuck on the road to nowhere

An editorial and an article describes how Britain's universities are stuffed full of postdoctoral researchers with no hope of gaining a permanent job in academia. They are unwanted by industry and face a future of uncertainty.


Source: SPIN

COMPUTER BASED LEARNING IN NEUROPHYSIOLOGY

The workshop, organised under the Computers in Teaching Initiative, will be held at the University of Liverpool from 10.30 am to 4.30 pm on 18 December 1995. Consisting of a mixture of short talks, demonstrations and hands-on practical sessions, it will provide the opportunity to find out what computer-based resources (TLTP, commercial, shareware and public domain) are available for teaching Neurophysiology and how they can be used.

Numbers will be limited and there is a registration fee of £30. Overnight accommodation can also be provided, at extra cost.

For further information, contact CTI Biology, Dunnan Labs, University of Liverpool, PO Box 147, Liverpool, L69 3BX, tel (0151) 794 5118, fax (0151) 794 4401, Email ctibiol@liv.ac.uk
These articles are brief summaries of two designated lectures organised jointly by the Gastrointestinal Tract and Autonomic Function Special Interest Groups and presented at the Oxford Meeting this summer. They were commissioned by David Grundy.

**NEURAL CONTROL OF THE PANCREAS**

**New Studies of Pancreatic Ganglion Neurons**

The ganglionated plexus of the mammalian pancreas, discovered independently by P. Langerhans and R. Cajal well over a century ago, has since been largely neglected. It is generally thought that pancreatic ganglia function as relay and distribution centres for incoming signals from the sympathetic and parasympathetic nervous system. The results of recent studies in several laboratories have, however, begun to force a reconsideration. Pancreatic ganglion neurones contain VIP, NPY, SP, CGRP, and GABA, and Monoamine oxidase-B, a specific marker for elements of a nervous system intrinsic to an organ. The precise role the neuropeptides play in regulating their target cells within the pancreas is largely unknown. In addition to these peptides, the majority of ganglion neurones in the cat and dog also contain NADPH diaphorase most likely indicating they contain NOS and manufacture NO. Also, a significant number of pancreatic ganglion neurones contain heme oxygenase-2 raising the possibility that CO is a signalling molecule in this neural network.

Most pancreatic ganglion neurones are surrounded by varicose nerve fibres which contain a vast array of neurochemicals known to be signalling molecules in other parts of the peripheral autonomic nervous system. Nerve terminals ending in pancreatic ganglia contain acetylcholine, 5-HT, noradrenaline, NO, GABA, and VIP, NPY, SP, CGRP, and CCK-like immunoreactive material. NOS is present in the terminals of vagal afferent fibres while noradrenaline and NPY are present in projections of coeliac ganglion neurones. A population of serotoninergic, cholinergic and VIP/NO-ergic enteric neurones located in the myenteric plexus of the distal antrum and proximal duodenum of the guinea pig project their axons to pancreatic ganglion neurones. This enteropancreatic projection may modulate exocrine (amylase) secretion and endocrine (insulin) secretion.

**Structure and Activity of Ganglion Neurones**

Only recently has the pancreatic ganglion network been studied by quantitative morphological and electrophysiological methods. Ganglia in the head region contain on average 25-30 neurones per ganglion in contrast to an average of 8-10 neurones in the tail region of the pancreas. When volume is reconstructed in 3-D, the cell bodies of ganglion neurones are found to be pancake-shaped, and have a limited dendritic tree when compared to sympathetic neurones of prevertebral ganglia.

A striking electrophysiological feature of pancreatic ganglion neurones is that a large percentage (>90%) display a phasic discharge of action potentials during prolonged injection of a strong depolarizing current pulse. Pancreatic ganglion neurones receive convergent nicotinic fast synaptic inputs, most of it subthreshold for initiating action potentials. Some neurones appear to receive fast synaptic input mediated by 5-HT acting on 5-HT3 receptors. The majority of neurones also exhibit slow-EPSPs. SP, CCK, VIP, acetylcholine acting on M1 receptors, and 5-HT acting on the orphan receptor 5-HT1P, all appear to mediate the slow-EPSP to variable degrees in different neurones. An intriguing finding is that a large number of pancreatic ganglion neurones generate “spontaneous” bursts of activity consisting of an abrupt onset of high frequency (10-20 Hz) nicotinic fast-EPSP activity which lasts several minutes followed by a quiescent period. Such bursts occur every 6-8 minutes, a periodicity that is strikingly similar to the periodicity seen in pulsatile secretion of insulin in several mammalian species.
Looking to the Future

Although a considerable amount of new information is now available, our understanding of the functional role of the pancreatic ganglionated network is still quite limited. Our appreciation of the complexity of this neural network is about where our understanding of the enteric nervous system was in the early 1960s. Deciphering the plurichemical nature of the synapses and synaptic transmission will be the key to understanding how the pancreatic ganglia function to control endocrine and exocrine secretion. It is anticipated that many of the new quantitative electrophysiological techniques successfully applied to other areas of neurosciences, as well as other techniques now only imagined, will be successfully applied to studies of pancreatic ganglion neurones and will throw more light on this intrinsic neural network.

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PIPETIDERIC AFFERENT NEURONES IN THE GASTROINTESTINAL TRACT

Capsaicin Sensitive Afferents

The gastrointestinal tract is richly supplied by primary afferent neurons of spinal and vagal origin. These afferent neurons can be differentiated on the basis of morphological, neurochemical and functional criteria and their investigation has been facilitated by their sensitivity to the excitotoxin capsaicin. Studies using capsaicin have revealed that the sensory neurons which supply the gastrointestinal tract fulfill an astounding multitude of functions.

Sensory Functions and GI Homeostasis

In the first place, these neurons convey sensory information to the central nervous system. The unmyelinated spinal afferent neurons generally respond to non-physiological, noxious stimuli of a variety of modalities. Particularly worth mentioning is their sensitivity to irritant chemicals such as H+ ions and peptides of bacterial origin. In contrast, the unmyelinated vagal afferent neurons are excited by physiological stimuli which include certain chemical constituents of ingested food and food-induced distension. In addition to their sensory function, capsaicin-sensitive afferents participate in the autonomic control of digestive functions and in the maintenance of homeostasis in the face of pending irritation or trauma. For example, the vagal afferent neurons play a role in the reflex regulation of gastric acid secretion. The spinal afferent neurons contribute to inhibitory viscerovisceral reflexes such as the shutdown of gastrointestinal motility caused by peritoneal irritation. This depression of motor activity results from increased sympathetic outflow to the gut.

There is a third role of capsaicin-sensitive afferent neurons which arises as a consequence of peptides which are synthesised - peptides such as calcitonin gene-related peptide (CGRP) which are synthesised in the somata and transported to the peripheral nerve endings. Following afferent stimulation, this peptide is released from the peripheral nerve endings to control, among other things, blood flow and gastrointestinal motility via these axon reflexes.

Blood Flow and Mucosal Protection

In the stomach and elsewhere in the gastrointestinal tract, capsaicin-sensitive afferent neurons play an important role in the reflex regulation of blood flow and mucosal protection from injury. Stimulation of these neurons reduces experimentally induced injury in the rat gastric mucosa, an effect which is associated with a marked increase in gastric blood flow. In contrast, ablation of unmyelinated afferent neurons by pretreating rats with a neurotoxic dose of capsaicin enhances the susceptibility of the gastric mucosa to experimental damage. Because mucosal repair is not impeded by sensory nerve ablation it appears as if chemonociceptive neurons function as an emergency system which strengthen the defence mechanisms against acute injury. It is in line with this contention that capsaicin-sensitive afferent neurones provoke an increase in blood flow when the gastric mucosa is challenged by acid back-diffusion, with pharmacological evidence implicating a role for nitric oxide in addition to CGRP as the primary mediators of the hyperaemic response.

The triad of sensory, afferent and effector functions puts capsaicin-sensitive afferent neurons in a special position to regulate gastrointestinal physiology and homeostasis.

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At a time when basic sciences such as Chemistry and Physics are having severe problems recruiting students, Sports Science Departments, which are springing up in Old and New Universities throughout the country, are overwhelmed with applicants. In Birmingham this year there were over 4000 applicants for 120 places, with A level grades amongst the best in the Faculty of Science. What, then, is this new subject? Is it an easy option, do we give away degrees for running fast and kicking footballs, can there be any real research in this Mickey mouse subject? The answers are No and Yes.

Sports Science is finding its feet in this country and individual departments vary from those that are very similar to conventional physiology departments to those where leisure management and social policy dominate the academic activity. The School of Sport and Exercise Sciences at Birmingham sits towards the physiological end of the spectrum. Originally the Physical Education Department in the Faculty of Arts, the School was reconstituted within the Faculty of Science in 1988 with Mervyn Davies appointed as Professor of Applied Physiology. Just as this process of change was gathering momentum Mervyn was taken ill and has had to take early retirement, but the changes he initiated are now coming to fruition. The School offers two single honours BSc courses, one concentrates on the physiological and biochemical aspects of sport and exercise, while the other emphasis the psychological side of the subject. The staff of 18 includes nine members with special interests in physiology, biochemistry or biomechanics, six of whom are members of the Society. There are six Psychologists of whom two are Psychophysiologists and the School has close links with the School of Psychology in the Faculty of Science and the Department of Physiology, in the Faculty of Medicine.

From Fatigue to Performance to Rehabilitation

The research activities of the School fall into three overlapping areas, Exercise Physiology, Motor Control and Applied Psychology, with motor control being the main meeting point of physiology and psychology. The interests of the Exercise Physiology group are peripheral and central mechanisms of fatigue and adaptations to endurance training, including angiogenesis and the modification of pressor responses. In the area of Motor Control the concerns are for the study of posture, strategies for landing from a jump, biomechanical modelling of complex movements and visual processing of peripheral information during movement. The main concerns of the Applied Psychology group are stress in relation to cardiovascular disease, anxiety and performance and strategies for motor learning.

The research effort is mainly concerned with basic mechanisms so that studies of young and old, healthy and sick, pedestrian and elite athletes are seen as equally valid, yielding information that is as useful both to an athlete training or a patient undergoing rehabilitation. On the applied side, the School is currently involved in developing a Human Performance and Sports Medicine Unit situated in the University Sports Centre. This will not only provide a valuable service to sports people within the University, the local community and to national squads, but also act as a focus for multidisciplinary teaching and research into the prevention and rehabilitation of injuries.

Not a Poor Imitation of Physiology

Sports Science, as it is developing in many universities in this country, should not be seen as a poor imitation of physiology. In the long history of physiology, much of the integrative and systems physiology has been conducted outside conventional physiology laboratories, often in departments of medicine. Now this trend is extending to include other disciplines such as Physiotherapy and Sports Science. The danger in this situation is that physiologists working in these departments may become isolated. However, where there is a sufficient critical mass, the opportunity for collaboration with biochemists, biomechanists, psychologists and clinical colleagues provides an exciting prospect for human physiology. In trying to understand complex activities, whether they be the peaks of sporting achievement or the routine tasks of everyday life, it is important to have an holistic view and Sport and Exercise Science may prove to be the place for this approach.

David Jones
Professor of Sport and Exercise Sciences
The University of Birmingham
Correlation between the physiological and morphological attributes of any single neurone are studied most directly by the intracellular injection of a marker following electrophysiological recording. Methods of intracellular tracing which do not require extensive processing, or alter the electrophysiological characteristics of the recorded neurone and yet provide good definition of the morphology, are continually being sought.

Since horseradish peroxidase (HRP) was established as an intracellular marker in 1976, neuronal tract tracers have been tested regularly for their use in intracellular labelling (Light and Durkovic 1976). Dextran based tracers were first used about 10 years ago (Gimlich and Braun 1985) but became popular only in the last few years as low molecular weight versions appeared. Recently we examined if such low molecular weight, fluorescent labelled dextrans are indeed suitable for intracellular staining. Mixing 10 % of tetramethylrhodamine labelled dextran (TMR-dextran), Mw:3,000 into the electrode solution (1.5 M potassium methyl sulphate) we achieved excellent staining. Good definition of the cell body as well as extensive regions of the dendritic tree were observed in more than two third of the injected cells. The presence of TMR-dextran in the electrode had no adverse effects on the quality of electrophysiological recordings; in our in vivo preparations stable recordings could be maintained for over half an hour. The electrophysiological characteristics of the penetrated cells were similar to those obtained using biocytin-containing or tracer free electrodes (Bradley et al. 1994).

Dextrans are hydrophilic polysaccharides produced by certain bacteria. Due to their water solubility, low toxicity and relative inertness they are well suited for application in live cells. These chemical characteristics also make dextran an excellent water-soluble carrier for dyes, such as fluorescent markers. While they are available in a different sizes, for intracellular labelling the low molecular weight dextrans are best due to their faster diffusion rate (Fritzsch 1993). In addition, we recommend TMR conjugated dextran, as its red fluorescent signal was found to fade relatively slowly over time. Dextrans, conjugated to a large variety of dyes are however now available for multiple labelling studies. Using various fluorescent conjugated dextrans, for example, identification of two or more neurones within a restricted region of the brain can now be achieved without compromising the electrical properties of the recording electrodes.

The presence of a biologically uncommon type of polyglucose linkage gives dextrans a resistance to most endogeneous glycosidases. This is rather important in in vivo intracellular studies where structures, that are often made up of diverse cell populations, are targeted blind. During these experiments neurons often get damaged, start to leak and gradually lose their tracer content. In such cases, dyes carried by dextran molecules are more likely to survive degeneration and remain at the site of the injection. This allows the experimenter to determine at least the location of the recorded cell even when the morphological features are lost. Considering their relatively low cost, easy and convenient application and versatility, we believe that fluorescent labelled dextrans have a considerable potential for use as intracellular markers.

Aniko Zagon, Alison Bradley and K. Michael Spyer
Department of Physiology
Royal Free Hospital School of Medicine

TMR - dextran labelled neurone in the ventral medulla oblongata of the rat. Arrow points to the sight where the electrode penetrated the dendrite of the cell, leaving some extracellular spillage of TMR dextran.

References:

By popular request, in this issue of the NetWatch column we will be going back to basics and finding out just what you need to get onto the World Wide Web (WWW). It seems these days that wherever we turn, whatever publication we read, there are references to the Internet and especially the WWW. The now famous, or should that be infamous, Internet address or Uniform Resource Locator (URL) is cropping up all over. Some of us are only now becoming accustomed to using email so when we increasingly hear at meetings 'what's your URL?', you know it's time to get to grips with the next big thing. But where to start? Well, help is at hand. Over the next two pages I hope to be able to show you the essential minimum needed to get you up and running on the WWW.

Getting and configuring a copy of Netscape

To browse around the WWW you could use any number of different software applications. However, by far the most popular, accounting for some 70% of all web browsers, is the Netscape Navigator. There are a number of very good reasons for going with the consensus of opinion and choosing Netscape as your preferred browser. Chief amongst these are its user friendliness, its speed, and its built in security features. For the simple reason of limited space, the rest of this column will assume that you are using Netscape to browse the web. I would be happy to discuss using other browsers with anyone if they email me (address at the end of this article).

OK, so where do you get Netscape from? Well, the answer to this somewhat depends upon your current level of Internet expertise. If you are already familiar with using the Internet, you can download your own copy of the latest version from the national software archive at Imperial College. Although Netscape is a US product, I wouldn't recommend trying to download a copy from the US as very often transfer times can be very slow. Fortunately, Imperial College keeps a UK copy of this and most other Internet software. The URL to download Netscape itself is 

ftp://src.doc.ic.ac.uk/computing/informationsystems/WWW/Netscape/netscape/

This URL points you to a directory where you will find versions of Netscape for Windows, Macintosh and Unix. Once you have downloaded Netscape, follow the installation instructions that come with it. Of course, if you are completely new to the Internet, all this won't make a lot of sense. But don't despair, you still have a couple of options. Firstly, and perhaps the best method, is to speak to an Internet-aware colleague and ask him or her to install a copy on your computer. Certainly in our department that's how most people get online. Secondly, ask your local computer centre. They will almost certainly have a copy of Netscape on disk and will be able to provide you with installation instructions.

There's very little you need to do to a new copy of Netscape to get started once it's been installed. The main preference settings you need to enter are listed in Fig 1 and 2. As you become more experienced, you may want to change other settings.

Fig 1
As you become an experienced user of Netscape, you may find you want to customise Netscape's behaviour in some way but in order to get started there are very few preferences you need to change manually. To customise your version of Netscape, you access the 'Preferences...' option from the Netscape 'Options' menu. In the figure above, all you need to change is the default home page location. I would recommend that you enter your institutional home page here or perhaps even that of the Physiological Society itself (see Fig 3).
Where do I go from here?

The first thing I always tell people who have just installed Netscape or any other browser for that matter is to find the URL for your institution’s home page. Almost every higher education establishment has its own WWW home page these days and invariably that page will provide you with a list of pointers to other universities, institutions etc - both nationally and internationally. For example, from the home page at Birmingham University you can make a link to every other UK university on the WWW. If you set up your copy of Netscape to use your institute’s home page as the default home page Netscape starts up with, you’ll always start your WWW browsing sessions from a familiar place.

Perhaps the first WWW site you should consider visiting after your institute’s home page would be the home page of the Physiological Society (Fig 3 and Fig 4). This site contains not only all you could ever want to know about the Physiological Society but also contains a list of all other known physiology departments worldwide. From here, you can spread out on your navigation of the WWW and who knows where you’ll end up next.

Fig 2
In order to personalise your copy of Netscape, you need to enter certain extra information such as your email address etc. This information is entered in the ‘Mail and News’ section of the ‘Preferences...’ menu option. The information given above shows the settings on my own copy of Netscape. Simply change the relevant information accordingly to personalise your own copy.

Fig 3
The home page of the Physiological Society is a good place to start on your explorations of the WWW. The URL for this is http://physiology.cup.cam.ac.uk/

See Fig 4 to find out how to make Netscape open this and all other URLs.
To enter URLs such as that for the Physiological Society, you must first select the 'Open Location...' menu item from the 'File' menu.

Then simply type in the URL and press the 'Open' button.

OK, that's about it for this issue. Clearly there's much more to the WWW than can be said in such a short article but hopefully you are now fully equipped with the basics to get you started. We at the Magazine are very interested in your views about printing more of these Internet 'Getting Started' guides. Please do drop us a line and tell us if you want to see more. We are always on the look out for interesting pieces to include in the regular NetWatch column so please keep sending in those ideas too.

David Davies
Department of Physiology
The University of Birmingham.

The quick NetWatch guide to the URL.

The common currency of the Internet is the URL. But what exactly does these unfamiliar things mean and why are there so many different types? Take this URL for instance:

http://medweb.bham.ac.uk/http/depts/phg/phghome.html

What does all this mean? Well, every URL can be broken down into specific parts. For example, http:// tells us that this URL is a pointer to a WWW page. Other URLs might be pointers to a downloadable file (ftp://), a Usenet news group (news://) and so on. This part of the URL specifies what type of Internet service the URL points to. There are at least 7 different types of Internet service and we'll be covering those in future issues of the Magazine. But for now let's restrict ourselves to the WWW. OK, so what's the rest of the URL telling us? The next part after the service type is the machine address. In the case of our URL above, it's medweb.bham.ac.uk. This is simply the Internet address of the computer on the Internet. Just think of it as the equivalent of a phone number, it simply specifies where on the Internet the URL points to. Lastly, there's the directory path and file name, in this case /http/depts/phg/phghome.html. It starts with a list of directories or folders to the requested file and ends with the filename itself, in this case phghome.html. So, if we were to restate this example URL in plain English, it would be 'get me the file phghome.html from the directory path /http/depts/phg/ from the WWW on the computer named medweb.bham.ac.uk.'
An Approach to MRC Grant Committees

So, you want some money from the MRC. Why not ring them up and ask? Seriously, it is not a bad starting point. There are people who are prepared to talk to you and that can save an awful lot of misguided effort. In many cases it will stop you from making entirely the wrong pitch and producing an application that referees rejects before they have got through to the science in your proposal.

But, I didn’t mean to start like this. I should explain that I was asked to write this article because, until recently, I have been a member of the MRC Neuroscience Grants Committee. As a designated member (DM), I had to review and present to the committee, on average, five out of the 40 to 70 grant applications at each meeting. A second DM is also appointed and each application is sent to between three and six referees. Following verbal reports by the DMs, the referees’ written comments and scores are discussed by the committee and everyone gets to score the application - usually with guidance from the DMs. One recent change in procedure has been the opportunity for the applicant to nominate referees. It might be too early to say how well this scheme is working but there appears to be a tendency for the “scores” of nominated referees to be more polarised than other referees. So, be sure you know who are your friends if you take up that option. Since a DM plays a key role in the presentation of an application to the committee, it might be useful to point out what I looked for in an application.

A Focus, Clear Objectives

An important thing to get right is the focus. Your aims should be concise and realistic. You should have clear objectives. If you try and cover all ramifications of a topic, you are likely to get a low score on the grounds that no one will be sure which aspects you will actually cover in the time available. The result might well be a disjointed or incomplete set of investigations from which no relevant conclusions can be drawn. In the first section of the application, try to state your aims in a few succinct statements. In the same vein, don’t try and review everything that has ever been written on the subject when describing the background. More importantly, limit your plan of investigation to the key experiments or investigations that will allow you to achieve the aims of your application. It is difficult to believe that your reviewers won’t be impressed by your intentions to tackle everything in sight - but they won’t.

Establishing Credentials

Many applicants have a good idea but do not convince the committee that they really are equipped to carry out the study. If you intend to use a technique that is new to you, or stray into a field in which you are not experienced, a pilot may establish your credentials. Try and present some actual data rather than simply describe your efforts. Best of all would be the inclusion of an abstract of a communication that you have presented. That would show both aptitude and commitment.

Justifying Your Bids

It is important to treat all parts of the application seriously. Too often an applicant will fail to produce the relevant information and that can detract from your bid for funds. A frequent occurrence, for example, is the failure to justify personnel and other costs. It might seem obvious to you that you need a research assistant, but you do need to spell the reasons. Be realistic about your own input to the project and state clearly what other commitments you have and, equally, exactly what the assistant would do. The actual total sum for which you are applying is not so important. Don’t think that your chances will be improved by keeping costs low. A high cost application might initially raise an eyebrow or two but, if the justification is there, it will be judged on its merits - not on the cost. In fact, the committee has a quota of grants to allocate at each meeting, not a specific sum of money. Be careful though, there are always a few applications that go over the top. The authors are presumably so convinced of their merits that the application reads more like a demand than a request for support. Remember, just because your state-of-the-art technique is expensive, or you feel that you need a bit of every technician and secretary in sight, it is still necessary to justify each item. Good luck!!

Peter Ellaway
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HOW NOT TO SECURE A RESEARCH GRANT

I have just completed four years serving on two separate grants committees with the Medical Research Council. Perhaps some of the insights I gained about funding decisions might be valuable. Many applications fail because of an accumulation of shortcomings far more easily reversed than the fundamental one of not having had a good idea in the first place. I suspect that such shortcomings are more easily recognised if described positively, hence the title.

You have a well-formulated and novel idea for a research project. You write it up succinctly and clearly. You submit it within the relevant rules and meet all the criteria. You are now in some danger of winning yourself a research grant. To avoid the extra work and higher research profile that this will inevitably bring you, I have assembled these guidelines. Follow them carefully and, no matter how good your underlying ideas, success can be avoided.

- **Muddle.** Perhaps the most common single reason for failure is a muddled application. Muddle indicates confusion in you, the applicant, strongly discouraging the panel from trusting you with their money. To evoke ‘muddle’, describe many strands of work without conveying any sense of priority or timing. Avoid a clear-cut timetable for your project. Don’t prioritise the work. Don’t reveal plans for contingencies. Throw every idea that you have had in the field, good and bad, at the prospective reviewers; leave them to sort out what you might mean. A bonus of the muddled application is that ‘feedback’ about your failed application can give the reassuring impression that the reviewer was incompetent.

- **Form-filling deviancy.** Most grant bodies have pro-formas or explicit guidelines for the application document. Deviations from any prescribed form are easily achieved and might be enough to secure failure. Some grant-giving bodies, however, can retrieve even the most adventurous abuses, so you might have to go to extraordinary lengths to ensure refusal; in fact extraordinary length itself is a good route. MRC, for example, require 6 sides of A4 for project grants. It is obviously a good idea to use more by way of superfluous appendices, excessively long reference lists etc.

A subtle variant is to use small font sizes (several grant-givers don’t specify, so you can really go to town!). Combine small size with very close line spacing for greater effectiveness. This leaves your text on the approved number of pages but reliably gives the impression of being far longer than it really is. Most of those refereeing your work are likely to be older than you are (think about it!) so very small print is physiologically pretty likely to be effective (presbyopia is a function of age after all). However, this ploy can backfire as those referees more generous of spirit will unfortunately find the fault in their own failing faculties rather than your application.

- **Referee targeting.** MRC, and many other bodies, assign each application to the relevant committee on the basis of its title and abstract. A generalist functionary serving the committee has to make this decision. If you write a suitable obtuse title and uninformative abstract, your application will go before a completely inappropriate committee. Since your project should (by now) be pretty incomprehensible anyway, contriving to land it on entirely the wrong desk virtually ensures ultimate failure.

If it is not possible to put the assignment right off track, your project will pass to the relevant committee secretary. This person will designate, again on the basis of the title and abstract, one or two members with the task of presenting your project to the whole committee. The designated members will also probably respond to external referees’ written comments on your application. The designated members’ collective opinion and powers of advocacy, or condemnation, can be vital in determining the funding decision. Use that knowledge: Make an effort to discover the names of committee members. ‘Spot’ who is likely to be landed with your application. Now you can carefully avoid quoting their relevant work. Personal knowledge of the ‘designated member’ from symposia or their published work might help you to target your inappropriate comments.

You may well know more about the narrow field of your application than anyone else, including the designated members. They might be eminent, but are unlikely to be polymaths of Olympian standard. The external expert referees in your broad area are also likely to receive a lot of this type of reviewing work. These factors work in your favour. Contrive to use jargon (CR7-polyphasic AB cell transcobrial narcolisers), obscure abbreviations (CR7 cells, APNPP-NMPP, K7) and neutral verbs (affect, change, alter, shift, act, influence) in order to leave as much tough scholarship as possible for your reviewers. Avoid a concise ‘overview’ and reference to key reviews or the...
referees might catch your drift far too readily. Always ask yourself; “would I enjoy reviewing something like this?” Assure a negative answer and you should consistently keep your reviewers in their least generous frame of mind.

- **Language** Since referees and reviewers have to read many applications, a high tortuosity factor in a jargon/cliche-ridden text can really make their day (difficult). So a healthy serving of cliche and any other, so-to-say, by means of willfully perverse sentence structure, or (parenthetically) labyrinthine syntax, to coin a redundancy out of nothing, should contribute manfully to an on-going non-viability scenario for your work. Pull out all the stops and leave no stone unturned to assure the reader that s/he is dealing with a small intellectual pygmy to ensure the sought-after failing grade outcome, at the end of the day.

- **Big-name collaborator** Try to secure the services of a big-name, or two, as collaborators. Neglect to spell out their roles in your project and you receive the extra negative kudos of appearing to be trying to bask in reflected glory. Beware one potential trap; big-name collaborators who are active in another field might inadvertently give you the appearance of ‘interdisciplinary’ standing. Since there are often ‘earmarked’ funds for interdisciplinary themes you could find your non-alpha rated project being fished out of the ‘reject’ heap (“it fits the criteria”) and funded. It happens!

- **Avoid your strengths** Know your own strongest suits and avoid playing to them. Do not point out relevant skills you might possess; with luck the referees will be unaware of precise details of your CV. Ask especially for consumables, for equipment or for staff in areas about which you, like Manuel, ‘know nothing’. Do not seek out collaborators who could possibly help. Avoid reporting visits to renowned leaders in the field to pick up practical experience. The presentation of data from successful pilot experiments is to be strenuously avoided: this approach alone can come close to guaranteeing success.

- **Hypothesis testing** Science proceeds by hypothesis testing, so avoid describing any experimental protocol in such terms. Giving the appearance of a ‘fishing expedition’ in an area you have never previously worked is, on the other hand, an excellent failing combination. A related virtue is to avoid scrupulously any statements about the statistical power of the work. Thus, running costs, numbers of experimental animals/patients/samples etc. will be assumed to be mere guesswork. This leads me on neatly to.....

- **Money** Asking for too much is simply not a reliable way to avoid funding. If you have written a good application, the committee will fund it and simply spend time cutting your demands down to size. Even outrageous over-inflation provides poor grounds for rejection. However, there are two easy options in this category: you can sour a referee by asking for yet another expensive P1000, B52, C5, JCB or whatever, that everyone in the field knows you just had funded by some other body. Alternatively, asking for a bigger hard-disc, nicer monitor, faster processor and more colourful printer than the work demands, or than the referees themselves possess, is one sure way of upsetting them! A good twist is to use a six-month old quote to ensure that your price is OTT too.

- **Non-application** But, to be absolutely sure of not receiving a grant - don’t apply in the first place!

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**Wellcome to Glaxo**

Fifty scientists from the Wellcome-Foundation, the drug company which merged with Glaxo, have set up an academic institute co-ordinating multidisciplinary research in a ‘strategically focussed way’ at the new Institute of ‘strategically focussed way’ at the new Institute of Strategic Medical Research at University College London.

THES 1197 12 October 1995 p.2

Source: SPIN
A FOCUS ON VETS IN PHYSIOLOGY

An introduction by Susan Wray, who commissioned this series of articles

Why focus on vets and physiology? Because they’re there, could be one answer. They’re there as Members of the Society, (all 29 of them!), as Home Office Inspectors, as colleagues in neighbouring departments, as students to teach. There’s even one in the Press Office. As they’re there, how do they interact with the Society and physiologists in general? Could we do more to encourage research and research links?

To start at the beginning, there’s the vet student. As Bridget Lumb points out in her article, they’re actually not a bad lot to teach. Class sizes are still just about manageable (50 - 70) and they’re a bright, motivated, confident group to interact with. As a non-vet teacher of vets, it can be fun finding out about hitherto unexplored areas of physiology. Few veterinary students intercalate in any discipline and probably not even one per year in physiology, per school. It is however possible to enrol for a Ph.D in physiology without intercalating. Andy Trafford is one such student, and he has written about why he decided to study for a Ph.D. after qualifying as a vet. As physiologists, we are all aware of the interconnections between our discipline and medicine. Young people may still be advised to do medicine then physiology, to get the best overall view and understanding of the subject. Does veterinary medicine provide an equally good overview? The articles from Richard Dyball and Max Headly, two physiologists with veterinary qualifications provide some insight into this question. Max also points out the kind of jobs we expect them to do for us such as helping with animal ethical matters concerning the Journal of Physiology.

Veterinary Research

It is difficult persuading vets to work in academic departments rather than going into practice. An even greater difficulty arises with the question of what research they do. Who will train them if they haven’t got a Ph.D.? What is good veterinary research? Should it be directly related to a clinical problem, or only very indirectly linked? The quality of veterinary research has been questioned. Vet journals do not score highly on any impact factor listing. Lance Lanyon, the Principal of the Royal Veterinary College has written an article entitled “Veterinary Research - a Discipline in Crisis?” This examines, among other things, funding for veterinary research. Patricia Chisholm in an accompanying piece writes about the role of funding played by the Welcome Trust, which, under the terms of Sir Henry’s will, has a special place for veterinary research.

In asking David Eisner what it’s like to be a non-vet in a vet department, I have tried to consider another part of the relationship. Can one succeed in “their” world without a veterinary qualification? Certainly Anisley Iggo, FRS, a long standing Member of the Society and past Editor of the Journal did - he was head and Dean of Edinburgh vet school.

A Case of Neglect?

Finally, I would like to briefly raise the question whether we, as physiologists or a Society could do more to strengthen links with the veterinary world? Clearly we can not solve all problems, but what about encouraging veterinary physiology and physiologists? Could we (should we?), try to persuade more vet students to intercalate? Should we encourage those of them who felt attracted to physiology to be student members, even though physiology is not their main degree subject? Do we as a Society make staff in preclinical departments of veterinary schools feel welcomed? Quite rightly we always consider the relevance of medicine and always try to get clinical input. The Society has, for example, a “clinical scientist in the NHS” working group. Do we ever consider veterinary medicine and associated matters? The Society memorandum of Association states that the Society aims include, to... “facilitate the intercourse of physiologists... and thereby contribute to the progress and understanding of the biomedical and related sciences and the detection, prevention and treatment of diseases, disability and malfunction of physical processes in all forms of life”. Do we have a case of neglect to answer?

Susan Wray
Department of Physiology
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The challenge:

The department in Bristol teaches physiology to medical, dental, veterinary and science students. When appointed to a lectureship here in 1990 I was ‘invited’ to suggest areas in which I might contribute to the teaching output of the department. Rightly or wrongly I decided to concentrate my efforts on one course - veterinary science - rather than spread my time across several courses. Coming from a department in which the research interests of its members (including my own) are concentrated on excitable tissues, the suggestion of teaching integrated physiology was seized with enthusiasm. Who better to teach endocrinology and reproductive physiology to second year vet students? My training as a physiologist should naturally equip me to teach any topic; at the time though, I felt that my most relevant qualification was a Girl Guides ‘Milkmaid’s’ badge. So, unlike Max Headley (see accompanying article) my fund of clinical anecdotes was somewhat restricted.

A major challenge for any scientist teaching on a vocational course is that of convincing the budding clinician that the basic scientific principles they are taught are not as esoteric as they might think and might even be relevant to clinical practice. It could be argued that, although my clinical (and personal!) experiences were limited, I had a head start in this respect with a topic such as reproduction where the manipulation of physiological processes has such obvious and important implications for veterinary practice. The potential for demonstrating the relevance of basic science in the clinical situation was increased with the introduction of the new veterinary curriculum in 1993. A reduction in ‘didactic’ teaching and the introduction of ‘Directed Self Education’ provided a much improved forum for vertical integration. Devices such as Poster and Oral Presentations allowed even first year students to consider topics such as ‘Malignant hyperthermia in man and pigs’ or ‘Hyperkalemic periodic paralysis in the American quarter horse’. Presentation of this knowledge to their peers has the added advantage of developing and testing students’ communication skills - an essential part of the training of budding clinicians. The introduction of the new curriculum has also encouraged horizontal integration between the preclinical courses - a process that we have found benefits teachers as much as students.

The reward:

For the most part the challenge has been enjoyable. Developing any new lecture courses is time-consuming; developing one that has to take on board major species variations, and, in the absence of satisfactory text books, was a major hurdle for me. However, time taken to understand areas of physiology outside ones own immediate research interest can be very beneficial in that it provides new perspectives from which to view ones own research field. This non-clinician has also found it interesting to think more about the practical and clinical implications of physiological processes. An unexpected spin-off of my newly acquired knowledge was the number of times I was invited to dine on the strength of my intimate understanding of the sex lives of marsupials, camels and others.

Finally, one major advantage of teaching veterinary students is that they are, in the main, a highly motivated and enthusiastic bunch. Yes, it is important to them that they acquire the ‘right’ information to pass their exams and yes, they do demand to know the practical relevance of what they are taught but, as a group, they also exhibit a desire to understand the content of their course and to come to grips with the basic principles they are taught.

Bridget Lumb
Department of Physiology
University of Bristol

VETERINARIANS, RESEARCH, ACADEMIA AND WHAT’S NEXT?

In a moment of weakness I agreed to throw together a small article covering these topics to appear in the King’s meeting edition of the magazine. It is only now when I am actually sitting down and fabricating this opus that I ask myself why would anyone be interested in the specific ‘problems’ faced by a veterinary graduate deciding between the relative merits of a research based career and a life outside; freezing cold and wet, trying to replace Daisy’s prolapsed uterus with nothing more than an empty wine bottle and a torch. Perhaps this was the experience that finally helped me decide a life in the dark puzzling over fluorescent images was in fact the right decision for me.
Impacted Anal Gland or Thesis Writing?

Having had the initial thought that you may want to follow some form of postgraduate study do you do it immediately after getting through 'finals' or do you go out into the big wide world and get a little clinical experience? My own view is that it is worth spending some time, say six to twelve months, actually doing what you intended to do five years earlier. In all probability this will ensure that you never wish to see another impacted anal gland and will be happy in the knowledge that in the darkest moments of writing your thesis you could have been doing something else!

To some extent these difficult decisions have been made a little easier by the introduction of the Wellcome Veterinary Clinical Training Scholarships. In these unique schemes your Ph.D programme is spread over four years in which time you spend a total of twelve months doing clinical work. A similar scheme exists with the clinical element spent studying pathology - once again the central theme is to allow individuals to gain relevant clinical and research experience thereby allowing either of these disciplines to be pursued in the future.

The Decision

Assuming that everything goes to plan with the research project, there eventually comes a time when a similar decision has to be made. Do you return to practice or remain in academia? In which case do you try and attain a clinical or research post or try and combine both? With regards to the latter option how does a young (...at least at heart!) and relatively inexperienced researcher find funding for a research project, especially when they may have a substantial clinical case load and involvement in teaching undergraduates? It seems quite reasonable that funding bodies would be unprepared to support such an individual when there are likely to be a good number of more experienced researchers with more time available to devote to the proposed projects.

For an answer to this particular problem it seems that we have to turn our attention to the veterinary schools themselves. There seems to be a consensus of opinion that the research activity and output of the various departments should be supported and increased. Does this mean that the commitment to clinical material and student teaching is going to be significantly reduced by appointing additional staff through clinical income generated? Or, does it mean that anyone who genuinely wants to continue with research has to forsake clinical work altogether?

Hopefully this provides an insight into some of the decisions that I and other veterinary graduates have had to come to terms with. I have deliberately avoided financial considerations as these have been discussed in previous issues of the magazine and are no less acute for other budding academics than for veterinary graduates!

Andy Trafford
Veterinary Preclinical Sciences
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VETS IN BIOLOGICAL RESEARCH - A PERSONAL VIEW

Long before the Herriot books, I like many young people became interested in animal welfare. One of my uncles was a vet in general practice in a pleasant market town and I thought it would be fun to live like him. I managed to get decent "A" levels and was accepted at Clare College, Cambridge to read veterinary medicine. On my way through the course, I took the Part 2 of the Cambridge Natural Science Tripos in Anatomy. The late (Sir) Barry Cross was a lecturer in the Department of Anatomy at that time and through him I became interested in the function of the hypothalamus. Hypothalamic control of endocrine function is fundamental to most of the aspects of physiology that vets are interested in, specifically reproduction and growth. I was particularly interested in the posterior pituitary system because I had been impressed by its accessibility for study during the demonstrations by E. B. Verney. After graduation, I was offered a job by Hans Heller in Bristol which allowed me to work for a PhD; I then went to New York to learn electrophysiology from Chandler Brooks and Kiyomi Koizumi.

I never decided not to be a vet and at different times have done several stints as a locum in veterinary practice. Initially I wanted to try my hand at research and since it has never ceased to be fascinating, I carried on. I have worked in Departments of Pharmacology, Physiology and Anatomy, teaching many different aspect of
basic medical science. The veterinary course is a broad one and forms a good basis for a career in just about any biological discipline.

At present I teach both human and veterinary anatomy and I ran the human dissecting room in Cambridge for 2 years at one stage. My wife who is in general medical practice keeps me informed of current medical issues. My interests are in the structure and function of neuroendocrine cells which seem to be similar in many species so I do not see myself as being more involved veterinary or human medicine - my work applies to both.

Milestones in my research career have been the use of antidromic activation to identify secretory cells (I claim to have been the first non-Japanese to do this) and the realisation of the importance of spike patterning in the secretory process. Like everyone else in the field, I still use antidromic activation to identify secretory cells and I am still working on how the bursts of spikes are generated and what difference this makes. We have recently shown that oxytocin cells excite nearby oxytocin cells (but not adjacent vasopressin cells) during lactation. In the context of what difference the bursting makes to the secretory process, we have recently found that we can modify the excitability of the secretory terminals (both increasing and decreasing it) by appropriate stimulus trains. Conducting research is like confronting the Medusa; one problem solved throws up seven more. Many of the secondary issues are best addressed in vitro but I am committed to the belief that most physiologically important issues will, in the end, have to be researched in whole living animals.

There aren’t many vet schools in the UK, and not many other institutes in which veterinary physiology may be carried out, so it’s not surprising that there are rather few veterinary surgeons who go in for physiology. Serendipity decreed that I am one. On qualifying I was horrified at the prospect of doing any one sort of thing for 40 years, so procrastinated by doing a post-caltet honours degree in physiology. Failure in a rather ambitious student project made me determined to succeed in some sort of experimental work, and the simplest way of achieving this was to accept Tim Biscoe’s offer of a PhD place. So now it seems I’ll be doing my 40 years in academia instead.

The Value of Locums

When this appears I’ll just be completing 10 years back in Bristol, teaching physiology to veterinary students (amongst others) and doing all the other things that we all have to do. But there’s no doubt that having started off as a vet does give a slightly different perspective. Being a (supposed) clinician is one aspect of that. For a start it permits the young scientist with time on his hands to do some locums (6pm Friday to 8am Monday after 3 long experiments each week - all for £25 - is what sticks in the mind) and this helps the bank balance as well as providing a different perspective on life. It also builds up a fund of clinical anecdotes that get repeated airings a decade or two later when glazed eyes at the back of a lecture theatre need enlivening. It means that one gets called upon to sort out clinical problems in experimental animals late on a Friday afternoon when the official veterinary surgeons are hard to locate. And it provides a basis for whole animal experimentation that one takes for granted - until having to train one’s first science graduate PhD student. Then the difference that it makes between having and not having a clinical qualification becomes all too apparent.

TLC to the Veterinary Course

Being seen as someone who knows all about the veterinary profession also means that one gets involved in aspects that non-vets do less of. One aspect of that is providing TLC to the veterinary course - whether as preclinical dean or on the various committees related to veterinary teaching. One of my long-standing
commitments has been the reorganisation of the veterinary curriculum. We started on this back in 1988, but successive reviews of veterinary provision in the UK meant that until 1990 we didn't know whether Bristol would have a veterinary school at all. Thereafter much activity resulted in the introduction of a new curriculum in 1993 - incorporating aspects that Bridget Lumb discusses more in her piece. As with all reviews of professional courses, the emphasis was on reducing 'didactic' teaching at the same time as increasing the involvement and motivation of the students. Partly because of the structure of autonomous departments that contribute to the School of Veterinary Science in Bristol, we remained with the traditional course mould, but reduced lecture numbers (by 20-30%) and introduced what we decided to call Directed Self Education - a variant of Problem Based Learning that we hoped didn't have the assumptions built into previously used terms.

Magnetic Attraction

Then there are the issues of animal welfare/experimentation/ethics that seem to be attracted to veterinary physiologists as if to a magnet. It is understandable, if misguided, to think that a veterinary physiologist will understand all physiological systems and so be able to address stress/pain/welfare aspects and deliver erudite advice. In the current climate it would be all too easy to be sucked into this area full time; I try to ration it but the Journal of Physiology, lawyers and even the Home Office seem to think, between them, that I have unlimited time to give to such aspects.

Spending 6 years as an undergraduate did little for my bank balance (but rather a lot to it); luckily locums and overseas salaries came to the rescue for a few years. Since then the extra variety that having a veterinary qualification brings with it has added interest and spice (and rather too many commitments) over and above the pervasive, slavish, inordinately time-consuming hobby of being a physiologist.

P Max Headley
Department of Physiology
University of Bristol

Nobody would contest the absolute need for medical research, or the advantages conferred by active involvement in it of medical qualified workers. Some of them at least should combine the practical practice of medicine with investigation of the causes of the maladies they encounter. This is not to underestimate the contribution made to medical knowledge by those without medical qualifications it is rather to acknowledge the need for a continuum of investigative effort from those who treat patients to those who examine only their cells, their DNA, or statistics about their diseases. Without constant reference back to the natural situation in the species of interest, the force and focus of investigation will be lost.

As important as maintaining continuity between the subject and investigations on it, is recruitment of new blood and new talent to undertake the investigation of the future. It is for these reasons that it is totally appropriate for human patients to be treated, research concerning their conditions conducted, and students instructed, within teaching hospitals which are themselves part of universities.

The requirements of veterinary medicine parallel to those of human medicine. In the proposal to establish The Royal Veterinary College (twenty copies were necessary even in 1791) the proposers made clear the necessity for the veterinary art to be informed by veterinary science. The first building to be constructed was the equine infirmary.

Animals and Man

The reasons why proficiency in veterinary research is in national interest are clear. The use of animal products is still essential to our way of life and their safety and wholesomeness in the food chain is a particular area of increasing concern, as is the welfare of the animals during the production process. Infected animals not only suffer from their diseases but they are less productive as a result of having them. The products derived from infected animals may also carry the infection to consumers. This may be ourselves or, as in the case of BSE, other animals. The disconcerting habit of diseases crossing species barriers should constantly remind us of our own precarious animal status.
Animals also share the natural environment with us and, because they cannot construct as effective a technology-based cocoon as we do, their health can provide a sensitive indicator of the damage we are inflicting on our surroundings. Also, of course, many millions of people keep animals for the pleasure and reassurance of their company. These animals become part of the family and the same level of health care is often demanded for them as for their owners.

Disturbing News

The need for veterinary research is therefore self-evident and in our own self-interest. The question is whether, as a nation, we have organised ourselves to prosecute such research effectively. The answer here must assuredly be no. Which Government Ministry has a particular interest in veterinary medicine? Which funding agencies have programmes and research opportunities specifically related to veterinary problems? Where is the natural focus of disease investigation in this country? What support is there for the veterinary schools to practice, teach and research their art? What attempts are made to co-ordinate all this for best effect?

The answers to these questions are disturbing. No Government department or agency considers itself as sponsoring veterinary medicine in the same way as the Department of Health and the Medical Research Council are responsible for human medicine. Only the Wellcome Trust has a specific veterinary interest panel which supports training posts but neither research programmes nor projects. Veterinary research projects compete for funding with all other applicants through the Trust’s panel. (The BBSRC makes no mention of veterinary science in its mission statement. It has an Animal and Psychology Board to which veterinary projects would go and provides 7 veterinary scholarships for PhDs a year). MAFF supports a system of veterinary officers in the field and veterinary investigation centres, none of these have a responsibility for research. The Central Veterinary Laboratory at Weybridge, previously a part of MAFF, is now an executive agency existing on short term contracts. The BBSRC supports the Institute of Animal Health but the numbers of veterinary qualified people on Compton’s core staff if now less than the number of fingers on one hand.

Support of Veterinary Schools

So what of the veterinary schools? These at least have a clear and defined mission which incorporates practice, teaching, and research. How are they supported to discharge this responsibility? The answer is only as part of the Higher Education system. The three clinical years of the five year veterinary course are publically funded with roughly the same unit per student as clinical veterinary medicine (about £10K per year). However, unlike human medicine, that is the total of their support. Not for veterinary schools the provision of teaching hospitals to provide the cases and consultants to treat them. Not for veterinary schools the provision of SIFTR (the Service Increment for Teaching and Research) allocated by a sponsoring Ministry to meet the added expenses which a hospital incurs by teaching and research, (at some £50K per student year SIFTR dwarfs the HEFC-derived resource). Instead veterinary schools have to provide (usually through charitable fund raising) the capital costs of their hospitals, which they then must run in a sufficiently commercial manner to cover their costs, while also being the source of material for teaching and clinical research. When all this is done the same staff are expected to be able to compete for research funds in a funding market with no funds ring-fenced for the purpose. All this while being paid substantially less than they could earn privately.

A Winge and a Pleading

Is this a winge? Yes. Is it a special pleading? Yes. Is the special pleading justified? That is for the establishment (and the reader) to judge. The veterinary schools fear that our current structural underfunding and fragmentary support for veterinary science pose a real threat to the subject in this country. If veterinary science is to prosper it is necessary:

- that more research and investigation commissioned by the public be centred at the veterinary schools. Not only is this a natural home for it but in this location it can increase the number of people available to teach students and provide the role models essential to motivate these students to return to science rather than automatically head for private practice;

- that it is recognised that it is impossible to support a practical veterinary service (particularly in farm animals) that both makes money and is also used for teaching and research. Some veterinary equivalent of SIFTR is needed for the veterinary schools,
that veterinary research is recognised as a funding responsibility by an appropriate Research Council and that veterinary topics are not just fundable when they are a model for the conditions in humans.

Lance Lamyon
Principal of the Royal Veterinary College

A PHYSIOLOGIST IN A VETERINARY DEPARTMENT

Until five or six years ago, my only connection with veterinary surgeons was via my collection of pets. Like most physiologists, I had previously worked in a Medical School. I can therefore compare life, as a physiologist, in these two environments.

A Small Community

One major difference is that of scale. There are only 7 veterinary schools in the U.K. plus Eire. Until recently, each of these trained of the order of 50 students per year. This means that academic veterinary science is a small community. Sit on a U.K. committee dealing with grants for veterinary research and you will discover that several members of the Committee taught/ were taught by/ or have perhaps had even more intimate contact with the applicants.

As a “born again” veterinary researcher one must resent the way that most basic biomedical research has become identified as medical rather than veterinary research. Indeed the term “Veterinary Research” has become almost synonymous with things that humans don’t do such as chewing the cud and producing gallons of milk per day, whereas “Medical Research” covers everything else.

Emulating James Herriott

There are significant differences in teaching veterinary students. The smaller classes help: in Liverpool we teach 90 veterinary students per year and there is much more staff-student contact than in the larger classes seen in Medical Schools. The students are very vocationally-motivated. This can cause problems, as students who entered Veterinary School as a result of wanting to emulate James Herriott, discover that they must learn about 2nd messengers and active transport. There is less incentive for veterinary students to intercalate. Perhaps this is because there are very few jobs for veterinary graduates where research experience helps.

Replacing the 70kg “Man”

There is a certain amount of suspicion about whether those of us with science backgrounds can teach veterinary physiology adequately. It is obviously not very hard to mug up on rumination etc. However, all ones carefully learnt “relevant” examples, designed to keep medical students awake, have to be forgotten and replaced with veterinary ones. There is also a problem with numbers. I grew up with the (admittedly politically incorrect) 70 kg man. On a good day I can vaguely remember the GFR, cardiac output etc for this example. But should I now switch to the 3 kg cat, the 450 kg cow.....

My overall view is that it is fun to work in a veterinary school. Which of you in Medical Schools has been called upon to help their Dean (in this case a laudable vet with an intercalated degree in Physiology) round up a flock of escaping sheep? More seriously, don’t be frightened of coming to work in a Veterinary School. A number of very eminent physiologists seem to have thrived on it. Finally, if you need a mercenary reason to work in a Veterinary School, free (well perhaps the odd dinner invitation smooths the way) veterinary advice about one’s animals is not a bad one.

David Eisner
Department of Veterinary Preclinical Sciences
University of Liverpool
WELLCOME TRUST FUNDING OF RESEARCH AND TRAINING IN VETERINARY MEDICINE AND VETERINARY SCIENCE

The Wellcome Trust’s commitment to funding veterinary research originates historically from the specific request in Henry Wellcome’s will that veterinary medicine be included within the remit of the medical research funding programme to be designed by his Trustees and, currently, from the view of the Trust’s present Governors, that the best practice of medicine, both human and veterinary, is underpinned by excellent fundamental research in all relevant biomedical scientific disciplines.

The Trust funds specific veterinary research projects through its usual routes for the provision of ad hoc support; viz., through project and project grant support and through major awards. The total sum currently invested is just over £12M (Table 1). Veterinary research projects compete for funding with all other applications through the Trust’s Panels, i.e. Grants Committees, and the Physiology and Pharmacology Panel sees a substantial proportion of the Trust’s applications for research in the areas most directly relevant to veterinary medicine. The large majority (52 out of a total of 57) of current veterinary ad hoc awards are for basic rather than for clinical research.

In its published policy statements of 1992 and 1995, the Trust made a commitment to develop and sustain a strong career support programme for individual researchers. In pursuance of that commitment, it has created a range of personal support schemes for individuals qualified in science, in medicine and in veterinary medicine. The Trust’s current portfolio of personal support schemes for veterinary graduates contains a range of schemes which provides training support and research funding to individuals from the earliest stages in their careers to the most senior level. Veterinary-dedicated support ranges from provision of intercalated degree support, through Scholarship/PhD support of a variety of types, to postdoctoral fellowships - integration of these veterinary-dedicated schemes with the existing general basic science and clinical Senior and Principal Fellowships provides a career progression for academic veterinarians who wish to pursue life-time careers in basic or clinical veterinary research.

Financial Commitment to Veterinary Research

In terms of financial commitment to the support of veterinary graduates, the Trust currently has over £6M invested in ad hominem awards for veterinary research. (Table 2). The majority of fellowship awards are for basic as opposed to clinical veterinary research and this bias mirrors the similar bias in the ad hoc awards (Table 1). This is perhaps not surprising since the same first criterion, viz. research excellence, is used in judging both categories of application to the Trust. In contrast, there is a significant bias in the Trust’s veterinary scholarship programme towards clinical research or training. This is deliberate and reflects both the strategic aim of the Trust to specifically support clinical veterinary research and the aspirations of many veterinarians to maintain clinical involvement during their research training.

The Trust’s financial commitment to veterinary research and training, of almost £20M in total or an estimated £7M per annum, should be seen in the context of investment from elsewhere - The Biotechnology and Biological Sciences Research Council (BBSRC) has a current commitment of £12M to veterinary medicine research in universities through its extramural funding programme - it also invests £40M per annum in its Research Institutes which, to a varying extent, carry out fundamental research of relevance to veterinary medicine. The Ministry of Agriculture Fisheries and Food (MAFF) has just over £35M invested in research grants for veterinary science. Research funding to veterinary science through the (S)HEFC allocation of government funds to the universities is currently £10M per annum.

There are numerous other small funding agencies and charities which provide specially targeted resources, for example Guide Dogs for the Blind and the Horse Race Betting Levy Board, although the amounts of funds available are comparatively small.

In summary, there is substantial UK investment in veterinary research. The Wellcome Trust makes a significant contribution to funding in this area. Although the veterinary research community can obtain funds for its research from providers of support for biomedical research in general, including medicine and comparative medicine, there remains a continuing need for specific veterinary-dedicated basic research. Different
species differ in, for example, their anatomy, physiology or immunology and in the diseases from which they suffer. Only by supporting research on particular species can advances be made in our understanding of their biology and hence, in the treatment of their diseases. The Wellcome Trust is willing to contribute, alongside the other major research funding agencies, to meeting that need.

*Patricia Chisholm  
Scientific Program Manager - Veterinary  
The Wellcome Trust

Table 1
Wellcome Trust Ad hoc* awards for Veterinary Research

<table>
<thead>
<tr>
<th>Basic Veterinary</th>
<th>Clinical Veterinary</th>
<th>Basic Non-Veterinary**</th>
</tr>
</thead>
<tbody>
<tr>
<td>£8.0M</td>
<td>£1.9M</td>
<td>£2.9M</td>
</tr>
<tr>
<td>34***</td>
<td>5</td>
<td>18</td>
</tr>
</tbody>
</table>

* Project and programme grants as well as major and capital awards.  
** Award to a Vet School but for research not specifically veterinary.  
*** Number of awards

Table 2
Wellcome Trust Ad Hominem* Awards for Veterinary Research

<table>
<thead>
<tr>
<th>Fellowships</th>
<th>Veterinary-dedicated</th>
<th>Non Veterinary-dedicated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Basic</td>
<td>Clinical</td>
</tr>
<tr>
<td>£1.4M</td>
<td>£0.4M</td>
<td></td>
</tr>
<tr>
<td>12**</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Scholarships</td>
<td>£0.3M</td>
<td>£3.1M</td>
</tr>
<tr>
<td>6</td>
<td>44</td>
<td></td>
</tr>
</tbody>
</table>

* not including intercalated degree support or vacation scholarships.  
** number of awards.
**Figure 1**
Research Career Progression for Veterinary Graduates

![Diagram of research career progression]

**RESEARCH ASSISTANT**
*(POSTGRADUATE)*

*University of Bristol, Depts of Physiology, Biochemistry & Medicine*

A research assistant post is available immediately at the IB Level to work on a new project funded by the Wellcome Trust. This multidisciplinary project involves the departments of Physiology, Biochemistry and Medicine in order to combine our existing strengths in molecular biology together with those in cellular heart research. The work will involve the use of cultured heart cells, patch clamp, fluorescence techniques for measuring Ca, and anti sense oligonucleotides for modulating protein expression. We will focus on the regulation of Ca channels and the sodium/calcium exchange in heart cells.

The post is for two years in the first instance, with an excellent possibility for a longer period. The successful candidate should have a degree in any of the basic medical/preclinical sciences or zoology/biology or a related subject. There will be an opportunity to register for a higher degree at the University of Bristol. Experience with cell culture and/or molecular/cell biology would be an advantage.

For informal inquiries contact: Dr Allan Levi (Physiology), Dr Andrew Levy (Medicine) or Dr George Banting (Biochemistry).

Allan Levi: email allan.levi@bristol.ac.uk; tel (0117) 928 8025 (direct line)
fax (0117) 928 8923.

Salary: £14,317 pa to £15,986 pa


Please send CV and the name and address of two referees to:

The Personnel Office (Kim England)
University of Bristol
Senate House
BRISTOL BS8 1TH
In the summer of 1994 I wrote to all members who had expressed an interest in joining the History of Physiology Special Interest Group. I described several of the activities initiated by the Society and asked for information about papers, photographs, films and equipment that might usefully be acquired for the Society archival collections. One came from Sir Andrew Huxley, who wrote:

“There is in my lab at Cambridge a piece in which you might be interested. It is a key part of a spectrophotometer that was being developed just before World War II by Glenn Millikan, one of the sons of the American physicist R.A. Millikan, famous for the oil-drop experiment. Millikan was then a Lecturer in Physiology at Cambridge; he had been a Research Fellow of my college (Trinity) and was living in the College. He was a most lively and attractive person who was extremely good to many students of my generation, taking us out in his car at week-ends, interesting us in his research etc., and was one of the influences that led me to switch from my original interest of physics into physiology. Both he and Britton Chance (who was in Cambridge, I think in 1938) worked with Jack Roughton, improving his rapid reaction apparatus etc.; Millikan used photoelectric methods to record the change in oxygenation of myoglobin in a cat muscle during work. Through contact with Keilin, he appreciated the value that a spectrophotometer would have for biochemists, and began to develop one in collaboration with the Unicam company, then recently started by a Mr Stubbings who I believe had previously worked for the Cambridge Instrument Company.

Just before the war, Millikan married Clare, the elder of the two daughters of the Mallory who was killed on Everest, and returned to the USA, where he developed his photoelectric device for recording the oxygenation of the blood in aircraft pilots. He asked me to take over the collaboration with Unicam, which I did as I stayed in Cambridge for the first six months of the war as a clinical student; the development did not progress very far, however, as Unicam had to concentrate on war work. Very sadly, Millikan was killed in a climbing accident shortly after the end of the war, and for that reason his name is less well known to physiologists than it deserves to be.

The part of the spectrophotometer that is in my room is the device for reducing the intensity of the reference beam so as to match that of the beam that had traversed the specimen. It is a rotating disc, opaque except for a sector whose angle can be adjusted while the disc is rotating. Its size is such that it would probably fit inside a 1 ft cube, and it is fairly heavy as it includes a substantial electric motor. I have no idea what happened to the rest of the apparatus. It included three interchangeable light sources (a tungsten lamp, a hydrogen discharge tube for the ultraviolet and I think a xenon arc), and the wavelength was selected by means of a quartz double monochromator made by Hilger. I do not know who is technically the owner of this article; I saw and recognised it in a passage in the Physiological Laboratory when I moved back to Cambridge from UCL in 1984 on my appointment as Master of Trinity College.

I am sending copies of this letter to Prof. Ian Glynn, head of the Department, and to Millikan’s widow in California; I quite expect that both of them would agree with me in regarding the collection that you mention as a very suitable home for this historic piece of equipment. I hope that the Working Party you mention would think it acceptable for the collection.”

The Working Party on Historical Equipment, comprising of members of the Society and the Science Museum, were very interested in acquiring this piece. After Sir Andrew had ascertained that both Professor Glynn and Mrs Millikan were happy for us to acquire the spectrophotometer part, Simon Chaplin of the Science Museum visited Cambridge to examine the piece and take it back to London, where it has been incorporated into the Society’s collection.

Dr Tilli Tansey
Wellcome Institute for the History of Medicine, London
phone and voice-mail 0171-611-8553/8616; fax 0171-611-8562
Measuring the pulse rate accurately in the days before there were second, or even minute, hands on clocks was technically challenging. It is interesting therefore that a major contribution to the development of a means to accomplish this readily was the pulse rate itself.

Galileo Galilei, we know, established the isochronic principle of the pendulum in 1583. He demonstrated that the period of the swing of a pendulum of a given length is independent of the amplitude of the swing. It is part of the lore of Physics that he recognised this independence by observing the swinging altar lamp in the Cathedral in Pisa and measuring its period. Galileo is supposed to have measured the constancy of this period by means of his own pulse rate. And as the resting pulse rate is really quite variable it is perhaps a reflection of Galileo's placidity, even as the inferences of his observations were becoming apparent, that his pulse remained sufficiently stable.

The noted Venetian physician Santorio was a member of Galileo's group of scientific friends. And when he learned about this principle he recognised that it could be utilized to construct a device that would allow the pulse rate to be measured accurately. This would be an important contemporary development as there were, at the time, not even minute hands on the few portable clocks available. What was needed was, simply, a variable-length pendulum. This, of course, could easily be constructed using a weight at the end of the string. The physician could then alter the length of the string until the period of the pendulum's beat corresponded to that of the patient's pulse: the pulse rate would now be accurately quantifiable. Marking the pulse rate on the axle of a circular drum around which the string was wrapped was a natural further improvement. As the drum was rotated, thereby lengthening or shortening the pendulum, a pointer would move to indicate the subject's pulse rate: the "pulsiloge" had been invented.

The pulse rate was therefore used to develop the principle that allowed an instrument to be developed that would allow the pulse rate to be measured.

A succinct account of this and other of Santorio's technical accomplishments including a thermometer, a hygrometer and, of course, his most widely-known device the weighing chair (that allowed him to make important early contributions to the concept of "metabolism") can be found in the section of Daniel Boorstin's superb treatise on ideas "The Discoverers" which chronicles medicine during that period.

The first FEPS (Federation of European Physiological Societies) Congress took place in September at the MECC (Maastricht Exhibition and Congress Centre) in Maastricht, The Netherlands. With over 700 participants from 35 countries, I was luckily enough to be one of them having been awarded a Physiological Society travel grant.

Amazingly, (as the plane resembled something from Raiders of the Lost Ark), I arrived at Maastricht airport in torrential rain hoping that the weather would drastically improve. Having decided not to struggle onto a bus to my accommodation, I jumped in a taxi only to find they are considerably more expensive than in the UK. Though having a Mercedes for a taxi instead of a Lada did make a difference.

My accommodation was right in the city centre with easy access to the conference centre, transport, shops and more importantly the bars. Maastricht hosts a vast number of cafes and bars and apparently a ban had to be enforced to prevent any more being built.

The conference got under way early on the Sunday morning, (with much improved weather) and was opened by the director of the University of Limburg. Next the president of FEPS, Robert Reneman gave a brief speech pointing out that the vast number of participants shows that physiology is alive and kicking.

The rest of the day continued with a variety of oral sessions including: myocardial metabolism, higher CNS functions and coronary circulation; followed by lunch and a wide selection of poster presentations before concluding with more oral sessions. Along with the poster presentations in the main Expo foyer, were stands from various companies and institutions, to name but a few; Perkin-Elmer, Cambridge University Press and the American Physiological Society.

The next day was of a similar format with a poster session entitled Endocrines and Reproduction in which I presented. It was good to chat to other participants of my own age during these sessions as we were few and far between. The poster sessions drew many people for enthusiastic discussions during and in between lunch and coffee breaks, also between cigarette breaks.

Throughout the conference students from the University of Limburg were available for information and help. They were easily spotted by their bright FEPS T-shirts. They also made the age difference less one sided.

That Monday evening brought everyone together for the main social event. The first FEPS banquet held at La Butte au Bois, Lanaken, Belgium. The restaurant was in beautiful woody surroundings and an excellent choice. The food was lovely, plenty of it and the wine flowed freely. Throughout the dinner we were entertained by the jazz band Trio Batte Herstein. However, although the music was good to listen to, unless you could dance a waltz or a rumba, you were stuck. It amused me that the singer, who had picked up an American accent from the TV, should recognise by my accent that I was from Wales and think of Tom Jones. Unfortunately, the festivities came to an early close with the coaches ready to leave at 11:30 PM and I hadn’t even had a dance. Not to worry, there was still plenty of bars open in Maastricht. I fear the next day people didn’t rise so early having attended the banquet the night before.

Maastricht was an excellent choice for the location of the first FEPS congress. The local atmosphere being very friendly with plenty of things for those accompanying the conference attendees to do and see. So much so that I stayed a few extra days enjoying the Dutch hospitality. Many thanks to FEPS for being able to attend this first congress and best wishes for future conferences. Special thanks to the Physiological Society for awarding the travel grant.

Helen Morgan
School of Molecular and Medical Biosciences
School of Medicine
University of Wales College Cardiff
Report of the Seventh Young Physiologists Symposium

The Seventh Young Physiologists Symposium took place at Bristol University on Monday 3rd July 1995. The aim of the day was to introduce new techniques in neuroscience, from cells through slices, to systems. This one day gathering was attended by about 100 physiologists ranging from 6 months (a speaker’s baby drafted in especially in accordance with our advertising campaign) to ageless professors.

After coffee and a few nervous words from the organisers, we launched into a first session of cells. Single-cell RT-PCR was elegantly explained and glutamate elegantly detected (using glutamate gated ion channels) before slices had their say. In hippocampal slices, imaging was highlighted as an important tool. This was further demonstrated in living forebrain slices, complete with a video of labelled axons stumbling their way through development. We know how they feel, though axons appear to be better guided than some young physiologists.

A well earned and excellent buffet was washed down with lively discussion and several posters. Themes ran from calcium channels to immortalised cells to stepping humans. All new techniques were scrutinised and the title seemed to be holding so far. There was even a ‘situations vacant’ board for those thinking ahead.

Moving through the day and along the title, on to systems. Firstly, a new in vitro heart-brainstem preparation that allows electrophysiological study of neurones controlling cardio-respiratory reflexes. Once again an intriguing video aided an intriguing explanation. No more in vitro now, but rather the in vivo behaving chick, used to study imprinting. This talk suggested solutions to some of the problems with extracellular recording in the CNS. To end the day, a talk on modelling as an increasingly important tool in neuroscience research, from cells to systems. So important, speakers will even fly from San Diego to discuss it.

Seven talks and eleven posters given by neurophysiologists as new and exciting as the techniques they use. With many thanks to The Physiological Society, Pfizer U.K. and our department for financial support We hope the day was rewarding for all those involved and would also like to thank the staff of Bristol University Medical School for all their help. The traditional evening meal (“New Techniques in Social Science”), attended by over half the audience, was also rewarding. Yet more interesting new techniques were introduced, to be continued, we hope, at the eighth Young Physiologists Symposium.

Melanie Atkins, Daniel Jagger and Matthew Jones
Department of Physiology
University of Bristol

SENSORY RECEPTORS: POSTDOCTORAL POSITIONS

Two postdoctoral posts funded by the Wellcome Trust are available immediately, until 30 September 1997 in the first instance, for the study of sensory transduction and adaptation in photoreceptors, olfactory receptor cells, auditory hair cells or muscle spindles. Applicants should possess a PhD or equivalent, together with experience of electrophysiological techniques, either at a single cell level or electroretinogram etc.

One post will be for research on either photoreceptors or olfactory receptor cells, with Trevor Lamb, and the other post will be for research on either hair cells or muscle spindles, with Andrew Crawford. Informal enquiries are welcome.

Written applications (including CV, with brief summary of research interests and the names and addresses of at least two referees) should be sent to either of:

Professor T D Lamb, tel (01223) 333856, Email tdl1@cam.ac.uk
Professor A C Crawford, tel (01223) 333879, Email acl51@mole.bio.cam.ac.uk
at the Dept of Physiology, University of Cambridge, Downing Street, Cambridge CB3 3EG, UK.

Salary is on the national RSIA scale.

The University follows an equal opportunities policy.
The current status of Physiology in Malaysia cannot be fully appreciated without a brief introduction of the demographic profile of the country. Malaysia is a relatively young nation, having achieved her independence from the British Colonial Government on August 31st, 1957. The country is divided into East and West Malaysia; the former being part of the island of Borneo whilst the latter forms the south-eastern peninsula of the Asian continent. Her population of approximately 19.6 million (as in 1994) is made up of mainly the Malays, Chinese, Indians, Kadazans and Iban. Almost fifty percent of these are below 20 years old, while a fifth are within the 20-29 bracket. The ratio of urban to rural dwellers is 47:53. Malaysia, which used to be agricultural-based country is now moving strongly towards industrialisation. The per capita income for 1994 was US$3530. More than ninety percent of the people are literate. The most widely used languages are Bahasa Melayu (95%) and English (65%). Currently, there are nine universities in Malaysia. Five of these universities offer medical course, i.e. University of Malaya (UM), National University of Malaysia (UKM), Science University of Malaysia (USM), Sarawak University of Malaysia (UNIMAS) and International Islamic University (IIU). The country has three Pharmacy (USM, UKM, UM) and only one each of dentistry (MU) and agricultural (Agricultural University of Malaysia; UPM) faculties. These are the places where local physiologists are normally attached to. It goes without saying that most of these physiologists are either British or Australian-trained.

The Malaysian Society of Pharmacology and Physiology (MSPP) is the only registered body which provides a platform for scientific interaction for the relatively small group of local physiologists. The society is made up of predominantly pharmacologists (40) and physiologists (30). The rest are pharmacists. The breakdown of the 30 physiologists based on areas of interests are as follows:

- endocrinology: 10
- renal and cardiovascular: 6
- exercise physiology: 6
- neurophysiology: 4
- miscellaneous: 4

The Origins of MSPP

MSPP started off as the Malaysian Society of Pharmacology and Experimental Therapeutics (MASPET). The idea of forming the latter was first conceived in early 1974 by several pharmacologists, amongst whom was the late Dr. Chan Onn Leng, from the Department of Pharmacology, UM. This was followed by a gestation period, marked by discussions with other interested members of the pharmacology department, UKM, and the School of Pharmacy, USM. MASPET was finally established in 1976 with the Registrar of Companies’ seal of approval. It had just over twenty members, with Dr. Chan Onn Leng elected as president.

Whilst still very much in its infancy, MASPET had its first scientific meeting in 1977, and it reached adulthood when it successfully hosted the Fourth South-East Asia and Western Pacific Regional Meeting of Pharmacology in 1985. By that time the membership of the society had increased to include a number of physiologists, and so at the 12th society’s annual general meeting (AGM) on June 3rd 1986, it was decided to officially acknowledge the participation and active involvement of physiologists. A proposal for a merger with other existing societies was put forward by Professor Philip Chang (UM), in the hope of attracting physiologists, environmentalists as well as toxicologists. In order to achieve this, Professor Tariq Abdul Razak (UKM) suggested that a slight change in the name of the society be made so that the incoming members could identify themselves with the society. There was a consensus to open memberships to the above-mentioned groups, but there might be problems related to the society’s affiliation to the International Union of Pharmacology (IUPHAR). Thus, the executive committee (EXCO) of MASPET was requested to look into these proposals.
Later in the same year, the EXCO reported that:

- physiologists has not formed a physiological society; however, the heads of the various departments of physiology has indicated that their staff were interested to join the proposed amalgamated society,
- the proposed name of the new society was "The Malaysian Society of Pharmacology and Physiology", and,
- the then secretary-general of IUPHAR had indicated that the international parent body has no objection whatsoever to the proposed change in the name of the society.

In order to expedite registration of the new society, a postal ballot was carried out. Of 30 ballot papers sent out, only 18 were returned. Fourteen of these were 'Ayes' whilst the rest 'Nays'. However, later it was realised that the society's constitution did not allow for postal balloting. Thus, members were requested to recast their votes at the following AGM. The proposal received a unanimous approval. The amendments to the old MASPET in 1989 was in essence the first AGM of its offspring, MSPP.

Ordinary membership was open to anyone having a University Degree in Pharmacology or Physiology or Pharmacy. This indeed resulted in an increase in the number of physiologists joining the society.

Activities of MSPP

Activities of MSPP are tailored towards realising the aims of the society, namely;

- to promote scientific communications between members of the Society through regular meetings and publications; and
- to promote cooperation with other professionals and to be an avenue for the public awareness on the use and abuse of drugs.

Thus, the main agenda of the society’s calendar is the biennial scientific meeting. These meetings are organised on a rotational basis by the three universities; UM, UKM and USM. This year’s scientific meeting was the eleventh of such meetings and was organised by the School of Pharmacy, USM, from May 26-28 at the resort island of Langkawi. The theme of this meeting was “Role of basic science research in health related industry". This was in line with the country’s aspiration of becoming an industrialised nation by the year 2020. At the time of the meeting, the Ministry of Science and Technology of Malaysia, the premier funding agency of the country, was requesting submission of research projects for funding purposes for the coming 7th Malaysia Plan (1996-2000). There were already indication that future trends in research funding would be evaluated for its ultimate worth in industrial development. Thus, the theme was chosen so that the decision would definitely be useful for scientists submitting their research proposals. A couple of foreign guest speakers, namely Dr. Edward J. Johns of Birmingham University, and Professor Matthew Gwee of National University of Singapore were invited to give lectures at the main symposium. Altogether, fifty papers on the latest and significant research achievements in areas of physiology or pharmacology in Malaysia were presented and the abstracts published by the Singapore-based Asia Pacific Journal of Pharmacology.

Occasionally, the society organises public exhibitions and symposia. In 1992, for example, a public exhibition and symposium on drug abuse was held in Kuala Lumpur. In conjunction with the occasion, the society decided to form a subcommittee to liaise with the National Drug Task Force of the Prime Minister’s Department, in order to organise activities directed towards tackling the current major concern of the nation, i.e. drug abuse. These include giving talks to schools and other institutions on the health hazards of addiction. Last year, a national workshop on animal experimentation was organised by University of Malaya. Another mainstay of the society’s activity is the MSPP newsletter. This is a quarterly publication, containing articles of interest and news on the society’s programmes and its seemingly perpetually active members. The society also publishes a membership directory handbook every two years or so. As far as future plans are concerned, joint meetings with the other Pharmacological and Physiological Societies in this region, for example with the Thais, Singaporeans and Indonesians are being initiated. However, the biggest event which the society is eying to organise is the Federation of Asian-Oceania Physiological Societies (FAOPS) congress in the year 2002. By then we hope to be able to put Malaysia on the ‘Physiological’ World Map.

Abu Bakar Abdul Majeed, Ph. D.
School of Pharmacy and National Poison Centre
University Sains Malaysia
Phosphorylation of caldesmon by mitogen-activated protein kinase with no effect on Ca2+ sensitivity in smooth muscle

Residual Ca2+ channel current modulation by megestrol acetate via a G-protein αs-subunit in rat hypothalamic neurones

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CTI Biology Workshop
COMPUTER BASED LEARNING IN NEUROPHYSIOLOGY
18 December 1995
University of Liverpool
This workshop consists of a mixture of short talks, demonstrations and hands on practical sessions, providing the opportunity to find out what computer based resources are available for teaching neurophysiology and how they can be used. Numbers are limited. Further details from: CTI Biology, Donnan Laboratories, University of Liverpool, PO Box 147, Liverpool L69 3BX, tel (0151) 794 5118, fax (0151) 794 4401, Email ctibioli@liv.ac.uk ★

Gordon Research Conference
MAGNESIUM IN BIOCHEMICAL PROCESSES & MEDICINE
28 January - 1 February 1996
Colony Harbortown Hotel, Ventura, California, USA
Please note that the location and finishing date of this conference have changed to those above ★★★

Biological X-ray Microanalysis Group
IONS IN CELLS: MICROSCOPICAL MEASUREMENTS & BIOLOGICAL ACTIVITIES
31 March - 2 April 1996
Dyffryn House Conference Centre, Cardiff, UK
Covers techniques for studying ions in cells ranging from X-ray microanalysis to ion sensitive fluorochromes, and the biological significance of ions in cells. Contributed talks and posters will be encouraged. Further details from: Dr A J Morgan, School of Pure and Applied Biology, University of Wales College of Cardiff, PO Box 915, Cardiff CF1 3TL, tel (01222) 874 000 ext 5872, fax (01222) 874 305, Email sabcw@cardiff.ac.uk ★

NEUROLOGY FOR NEUROSCIENTISTS
1-2 April 1996
Magdalen College, Oxford
How clinical neurology can illuminate neural function and help neuroscientists. Subjects include AIDS, Alzheimer's, multiple sclerosis neuroophthalmology, Parkinson's disease, stroke and prospects for neurotransplantation. Sponsored and subsidised by the Guarantors of Brain. Nominal registration fee of £20, some graduate students' travel expenses available. Further details from: Prof J B Clark, Neurochemistry, National Hospital, Queen Square, London, tel (0171) 829 8722 ★

Euromech 344 Colloquium
FLUID-STRUCTURE INTERACTIONS IN BIOMECHANICS
10-13 April 1996
Imperial College London
Further details from: Prof C G Caro, Centre for Biological & Medical Systems, Imperial College of Science, Technology & Medicine, London SW7 2BX, fax (0171) 584 6897, Email euromech96@cic.ac.uk ★★★

Symposium on DIABETIC ANGIOPATHY
17-19 April 1996
St Luke's College, University of Exeter
A one and a half day symposium will consider all aspects of diabetic angiopathy including the basic pathogenesis of large and small vessel diseases in this condition, retinopathy, peripheral vascular disease and cardiopathy. Further details from: Mrs Cathy Maguire, Dept of Vascular Medicine (Diabetes Research), Postgraduate Medical School, Barrack Road, Exeter EX2 5AX, tel (01392) 403 045, fax (01392) 403 027 ★

CLINICAL MICROVASCULAR RESEARCH WORKSHOP
Wednesday 17 April 1996
Dept of Vascular Medicine, University of Exeter
The Department of Vascular Medicine will be running a Microvascular Workshop which will include an introductory talk outlining theory and pitfalls followed by demonstrations. Only 12 places are available. Further details from: Mrs Cathy Maguire, Dept of Vascular Medicine (Diabetes Research), Postgraduate Medical School, Barrack Road, Exeter EX2 5AX, tel (01392) 403 045, fax (01392) 403 027 ★

2nd European Meeting on GLIAL CELL FUNCTION IN HEALTH & DISEASE
21-25 April 1996
Arcachon, near Bordeaux, France
Mainly focused on poster presentations, this international meeting will include 12 plenary lectures covering major fields of glial cell physiology, the cell biology of neurone-glia interactions and glial involvement in pathological states. Further details from: Dr Dionysis Theodosios, INSERM U378, Universite de Bordeaux II, 33076 Bordeaux cedex, France, fax (00 33) 56 98 19 15, Email gli@bordeaux.inserm.fr ★★★

The Royal Society
THE LEGACY OF JENNER: VACCINATION PAST, PRESENT AND FUTURE
14-15 May 1995
6 Carlton House Terrace, London
Organised jointly with the Royal College of Physicians of London, Royal College of Pathologists and Wellcome Institute for the History of Medicine (registration and fee required). Further details from IASP Secretariat, Vancouver, Canada.

International Microscopy conference and exhibition
MICRO 96
2-4 July 1996
Hammersmith, London
Main themes: probes in light, electron & digital microscopy. Deadline for submission of contributed abstracts for oral or poster presentation: Friday 5 April 1996. Further details from: Royal Microscopical Society, 37/38 St Clements, Oxford OX4 1AJ, tel (01865) 248 768, fax (01865) 791 237, Email rms@sax vox.ac.uk ★★

4th IUBMB Conference
THE LIFE & DEATH OF THE CELL
14-17 July 1996
Edinburgh International Conference Centre
Topics include: cell death mechanisms; cellular stress & protection mechanisms; signal termination & compartmentalisation. Further details from: the Conference Assistant [IUBMB 1996, The Biochemical Society, 59 Portland Place, London WIN 3AJ, tel (0171) 580 5530, fax (0171) 637 7626, Email meetings@biochemsoc.org.uk ★★

International Association for the Study of Pain
8th WORLD CONGRESS ON PAIN
17-22 August 1996
Vancouver, Canada
Further details from: IASP Secretariat, 909 NE 43rd St, Suite 306, Seattle, WA 98105, USA, tel (00 1) 206 547 6409, fax (00 1) 206 547 1703, Email iasp@locke hs.washington.edu ★★★

European Society for Comparative Physiology & Biochemistry
17th Annual Conference
ADAPTATION TO STRESS IN AQUATIC AND TERRESTRIAL ECOSYSTEMS
27-31 August 1996
University of Antwerp (RUCA), Belgium
Major themes include membrane organisation & functioning; defence systems and stress pollutions. Further details from: Dr R Blust, Congress Chairman, Dept of Biology, University of Antwerp (RUCA), Groenenborgerlaan 171, B-2020 Antwerp, Belgium, tel (00 32) 3 218 03 44, fax (00 32) 3 218 04 97, Email Blust@ruca.ua.ac.be★★

International Society for Mountain Medicine
2nd World Congress of HIGH ALTITUDE MEDICINE AND PHYSIOLOGY
16-21 September 1996
Cusco, Peru
Sessions include: physiology of acute and intermittent exposure to high altitude; endocrine & reproductive physiology, exercise, sports training at high altitudes; cardiovascular & respiratory physiology and pathophysiology. Further details from: Dr F Leon-Velarde, Universidad Peruana Cayetano Heredia, Dpto de Fisiologia, Apartado 4314, Lima 100, Peru, fax (00 51) 14 462 34 35, Email fabiolv@apch.edu.pe ★★
25-29 September 1996
Cambridge, UK

Sessions based around clinical conditions in which the function and the pathophysiology of the microcirculation is critically involved. Topics include: hypertension, diabetes, pre eclampsia, angiogenesis and the microvasculature. Deadline for abstracts: April 1996. Further details from: Hampton Medical Conferences Ltd, Hofer House, 185 Ladbroke Road, Hampton TW12 1BN, tel (0181) 783 0810, fax (0181) 783 0292 ★

The Ciba Foundation
Accommodation & Meeting Facilities in Central London

Any graduate in a scientific discipline on a working visit to London, or travelling via London, is welcome to use one of the 14 bedrooms for a period of up to two weeks. Charges as from 1 January 1996 are £57 for a single and £47 for a twin room which includes breakfast and VAT. Further details from: Sue Venables, Senior Administrative Officer, The Ciba Foundation, 41 Portland Place, London W1 2NA, tel (0171) 436 2840 ★

Cardiovascular Regulation
Studies In Physiology No 2
£16.45 for Members
ISBN 1 85578 024 0, Portland Press.

This new publication edited by D Jordan and I M Marshall provides an up to date account of our current understanding of the cardiovascular system. Each chapter has summary boxes and also essential reading suggestions for undergraduates, and further reading for postgraduates. This book will be of interest to students of cardiovascular and exercise physiology, and medicine. Contents include central nervous integration of cardiovascular regulation, cardiovascular changes associated with sleep, and metabolic control of blood flow with reference to heart, skeletal muscle and brain. ★

Neural Control of Skilled Human Movement
Studies In Physiology No 3
£14.95 for Members

This new publication edited by F W J Cody focuses on skilled movements in man, while drawing upon vital evidence obtained in other species. Attention is directed at movements of the hand and arm, but the production of speech sounds is also an important example of skilled movement. Concise updates of current understanding of the roles of the main motor centres cerebral cortex, basal ganglia, cerebellum and spinal cord in skilled movement and its clinical impairments. Contents include the control of speech, and impairment of skilled manipulation in patients with lesions of the motor systems. ★

Overseas Members
Overseas Members reserve their Meetings packets only a short time before a Scientific Meeting. As a consequence, making travel arrangements and reservations can be a problem. To help Overseas Members, booking forms for Meetings can be requested in advance of the usual delivery date from the Meetings Secretary's office.

Designated Sessions at Scientific Meetings

The Society has agreed that part of each Meeting can be set aside in advance for a Designated Session on a special topic. Such Sessions will run in parallel with the other sessions of Communications. Suggestions from Members for Designated Sessions at future Meetings can either be made directly to the Special Interest Group organiser or to the Meetings Secretary.

Animal Legislation

The Committee of The Physiological Society has an advisory group that monitors the working of the Animal (Scientific Procedures) Act 1986. Members are asked to provide any relevant information relating to its local implementation to: Tony Angel, Dept of Biomedical Science, The University, Sheffield S10 2TN, tel (0114) 270 1442
Cecil Kidd, Dept of Biomedical Sciences, Marischal College, University of Aberdeen, Aberdeen AB9 1AS, tel (01224) 273 006
Stephen Lisney, Dept of Physiology, School of Medical Sciences, University Walk, Bristol BS8 1TD, tel (0117) 928 7814

Visiting Scientists

Foreign visitors of the status of at least postgraduate student, working in laboratories of Members of the Society, may be made "Visiting Scientists" by the Society. They are then eligible to receive details of the Society's Scientific Meetings and to attend those Meetings for one year. The names of such persons, with the dates of their visits and a letter of support, should be sent to the Foreign Secretary, Prof O H Petersen, The Physiological Laboratory, University of Liverpool, PO Box 147, Liverpool L69 3BX.

Membership of The Physiological Society

The minimum criteria for consideration by the Committee for inclusion on the Membership ballot (as Ordinary or Foreign Members) are:

1. A candidate must have given at least one Communication or Demonstration in person to the Society.
2. A candidate must have published at least one full research paper on a physiological subject in a reputable journal.
3. The candidate must obtain the signatures of SIX Members of the Society who will sign a statement declaring that the candidate is well known to them, is practising in physiology or a cognate subject and is likely to remain so, fulfils the criteria for Membership and is likely to benefit from Membership of the Society and take part in its activities.

Full details and forms are available from the Administrator (Membership), The Physiological Society, PO Box 506, Oxford OX1 3XE, tel (01865) 798498, fax (01865) 798092, Email admin@physioc.org

The Benevolent Fund of The Physiological Society

The Fund is to be used:

"... for the purpose of assisting Members of the Society and staff and former staff (who by the nature of their employment can be considered to have contributed to the advance of physiology) employed at teaching research and industrial establishments concerned with the advancement of physiology who are in necessitous circumstances and the widows and widowers children and other dependants of such persons (hereinafter called "the Beneficiaries")..."

The Trustees have the powers:

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(iii) to establish and maintain homes and hostels and make grants or pay subscriptions towards the establishment and maintenance of homes and hostels;
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Discussing Posters

Professor Hans Ussing being presented with a crystal decanter by John Hall, on behalf of the Society, for delivering the Paton Lecture in the History of Physiology.

The University College, Cork

Helen Fitzwilliam (Meetings Secretary’s Office), celebrates her birthday at the Society’s dinner.

The Trade Exhibition

Vivien Rolfe kissing the Blarney Stone!

Professor Judah Folkman delivering the Shapley-Schafer Prize Lecture.