

March, 2006

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Newsletter

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The future of Physiology.

There has been a recent trend towards restructuring and integration of departments into schools that are broadly based in the biomedical sciences and providing support teaching in the health sciences.



Despite the advantages of this approach, one danger is dilution of physiology as a clearly defined and identifiable discipline that underpins biomedical research. The importance of this issue is highlighted by the International Union of Physiological Sciences (IUPS) establishing a Long-Range Planning Committee to investigate the future of the physiological sciences. Key questions that they plan to consider are:

- How is physiological science placing itself in relation to systems biology?
- How well do the physiological sciences place themselves to meet clinical needs?
- How should IUPS reflect the increasing interfaces with the physical sciences?

Locally, a reduced regard for physiology is seen in the under representation of our discipline on the NHMRC panels and the awarding of relatively few ARC grants in physiology compared

to other related disciplines in the last round. We may also be losing out on quality postgraduate students who fail to see a clear career structure in physiology. It is therefore incumbent on us as individuals and a Society to rise to these challenges. We must maintain the profile and leadership position of physiology in the biomedical sciences in an ongoing and sustained manner.

How can we best achieve these goals? In a recent article in *Advances in Physiology Education*, Dr. Dee Silverthorn¹ (University of Texas at Austin) makes a very strong case that physiology truly is the integrated discipline that underpins areas from chemistry through molecular and cell biology to the entire organism. This level of integration is quite apparent when one looks at any scientific programme from our Society meetings. Thus we need to ensure that the importance of physiology to biomedical sciences is reflected in the composition of the NHRMC panels. We must have representation by Society members on all the relevant NHMRC panels. We must also develop strategies to ensure that the significance of physiology is recognised by the ARC and other granting bodies.

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2006 AuPS Scientific Meeting Brisbane, 24-28 September

In 2006, the AuPS annual meeting will be held in conjunction with the Combio meeting at the Brisbane Convention Centre from 24-28 September. The Combio meeting features at least eleven symposium streams and over 20 international plenary speakers. It is expected to attract approximately 1000 registrants and will provide AuPS members an excellent opportunity to interact with colleagues in other areas. We also expect to welcome a number of new members to AuPS through this initiative. The conference is being organised by Sally Jay Conferences who have an ongoing commitment to these meetings. The AuPS conference dinner will be held separately from the main conference dinner and we are hoping to secure the University of Queensland Customs House on the Brisbane River for this event.

The symposium streams for the meeting are:
Protein Structure and Function

- Cellular Architecture and Biology
- Gene Expression and Regulation
- Bioinformatics and Systems Biology
- Signalling
- Diseases and Ageing
- Membrane Transport & Cellular Physiology
- Developmental Biology
- Plant function and Environment

AuPS has a total of sixteen 90 minute slots and we are planning nine symposia. In addition to these symposia, we will have seven free communication sessions. Combio also has a strong education focus and an education workshop will be held on Sunday, 24 September. As a result of holding a joint meeting with Combio, we will be able to have an outstanding selection of inter-

INVITED PLENARY LECTURERS

- Prof. David Clapham (*Harvard University*)
- Prof. Mark Donowitz (*Johns Hopkins University*)
- Prof. Gerry Oxford (*University of Indiana*)
- Prof. John Faulkner (*University of Michigan*)

AuPS SYMPOSIA

- Regulation of membrane transport (*Chairs: Cook and Bröer*)
- Molecular determinants of calcium signalling (*Barritt, Monteith*)
- Neurophysiology, two sessions (*Sah, Noakes and Phillips*)
- Homeostatic control of calcium and the diseased heart (*Hool and Woodcock*)
- Myopathies and muscle regeneration (*Lynch and Lamb*)
- Extrinsic and intrinsic control of smooth muscle in health and disease (*van Helden and Jobling*)
- Endocrinology: signalling and cross-talk (*Curlewis and Bathgate*)
- The environment and genome in development: signalling from the beginning (*Kaye and Owens*)

national speakers including four plenary speakers for AuPS (paid for by Combio). **Professor Caroline McMillen** (University of South Australia) has agreed to give the AuPS Invited Lecture and **Professor Mark Dunne** (University of Manchester) is the Physiological Society (UK) Exchange Lecturer. In addition, symposium organisers are encouraged to invite one international speaker for each symposium with support from AuPS.

The deadline for early registration and abstract submission is **Friday, 23 June 2006**. The registration costs will be **Members \$510** and **Students \$200** (but this will be partially subsidised by AuPS). As registration will be handled by Combio, any new members will need to complete their application for AuPS membership well before the registration deadline to take advantage of the members rate. Further information will be posted on the AuPS web site as it becomes available.

This promises to be an exciting and interesting conference and we look forward to your participation.

Philip Poronnik
Local Secretary

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Lastly, but not least, we must also, as a Society, ensure that physiology is marketed to the undergraduate student body.

One key to maintaining the profile of physiology in Australia is to grow the membership base of AuPS by reaching out to those disciplines with which we freely integrate. My aim is to see AuPS membership grow by 10% per annum. As we reach out to the other fields, we should recruit colleagues in these areas. A clear example of this is the great success of the combined AuPS/ABS meeting held in Canberra last year. This year we have the opportunity to share resources and research with Combio in Brisbane in September. There will be in excess of 1000 delegates at this meeting with a number of sessions that are of interest to AuPS members and vice versa. This initiative has already resulted in the registering of at least 20 new members with direct interest in the symposia covered by our Special Interest Groups. In addition, the resources provided by Combio has allowed us to invite outstanding plenary speakers from overseas which will also serve to highlight the profile of AuPS internationally.

AuPS will be driving the Biomedical Education Workshop to be held on Sunday 24 September. This will be an excellent opportunity to highlight the leading role that physiology is taking in scholarship and excellence in physiology education, and provide further links with other disciplines.

The other key area is to cater for our student cohort by providing them with opportunities to engage directly in the activities of the Society. At Combio, AuPS will sponsor a Student night where a high profile scientist will talk about their career(s) and research. We also plan to increase the number of student prizes to recognise the important contribution of our youngest members.

2006 promises to be an exciting and challenging year for the AuPS. I invite you to join me in working to raise the profile that physiology research in Australia deserves.

David Adams

References:

1. Silverthorn, D.U. (2003). Restoring physiology to the undergraduate biology curriculum: a call for action *Advan. Physiol. Edu.* 27: 91-96; doi:10.1152/advan.00016.2003

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AuPS Overseas Members

The AuPS has a specific category of membership for overseas physiologists who wish to maintain an association with the AuPS. This is excellent for students who were members during their doctoral studies but have perhaps taken a post-doctoral position overseas. There are also a number of overseas members who have an affinity with the AuPS from time spent in Australia in various capacities. As I looked through the list of members (available in the password protected 'members resources' area of the web site), I started to wonder how we could engage with them a little more with this newsletter. So, here is the first of what I hope will be many 'Postcards' from our overseas members and others who have an affinity with the AuPS. If you would like to see a postcard from someone in particular, or would like to volunteer to provide a postcard, please let me know, including the contact details if possible.

Trevor Lewis



Postcard from Bethesda

I completed my PhD in 2004, studying the structure and function of the glutamate transporter with Dr Rob Vandenberg at The University of Sydney. I then spent a year as a postdoc in the laboratory of Eric Gouaux at Columbia University, NY. Just before I arrived, the crystal structure of a bacterial glutamate transporter had been solved in this lab and during my time there I learnt protein crystallography and further studied the conformational changes of this transporter using both crystallography and functional methods. New York City is an amazing place to live and although its a little difficult on a postdoc salary, I really enjoyed my year there. In 2005 I was awarded a CJ Martin Fellowship and moved to the National Institute of Health (NIH) in Bethesda, Maryland. I am now working in the National Institute of Neurological Disorders and Stroke with Joseph Mindell where I am studying the mechanism of glutamate transporters using biophysical methods. Doing a postdoc overseas is a great opportunity to get exposure for yourself and meet other scientists in your field, which may lead to future collaborations. It is also a good time to experience working in labs and institutes that are well funded and have access to state of the art equipment. I live in Washington DC with my husband Adam. We are just across the border from Maryland and it takes about 30 minutes by train to get to the NIH campus. We just had our first big snow storm of the season and got close to a foot of snow in DC. The photo here is of me walking in Rock Creek Park, a huge park in the centre of DC which is at the end of our street.

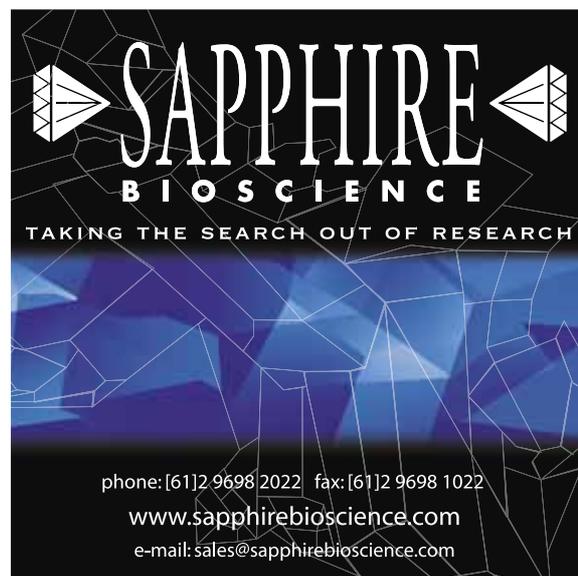
Renaë Ryan

Peer-learning in laboratory classes.

Practical laboratory classes provide an ideal opportunity for students to actively participate in the learning process, to test their understanding of concepts and to develop critical thinking skills. Often however the extent of the students' participation is limited to performance of experiments and data collection, while the tutor directs and leads discussion on the theory and concepts underlying the experiments, leading to a disengagement of the students from the topic.

At the School of Biomedical Sciences, University of Queensland, we introduced 'peer-learning' exercises in laboratory classes as a method to increase active participation by the students. In the laboratory classes students normally work in small groups, we asked each group to research and answer one question based on an aspect of the experimental topic for a short group presentation to their peers at the end of the class. This approach aims to increase the students' interest, active participation and understanding of the experimental topic, without unduly increasing the time taken or resources used for the class. It is also intended to foster self-reliance, encouraging students to rely on themselves and one another for information. It is also our belief that if students have greater influence on the direction of the discussion it would increase the contextual relevance of the information for them.

The use of student presentations in the class receives very good responses from the students, the level of engagement and interaction in the



discussions are markedly greater than occurred in these classes previously. The depth and breadth of the information discussed is at least as great if not greater than that presented by the tutor in the past. However, we find it is often necessary initially for the tutors to offer some reassurance on the quality of the information.

In conclusion, these relatively minor modifications, changing the class from an ‘instruction-centred’ to a ‘student-centred’ approach, appear to markedly improve the level of active participation and interactivity by the students, without significantly increasing the workload of staff or the resource use. Peer presentations mean that small-group discussions become meaningful as it gives them a purpose and peer pressure encourages the students to be diligent and present information of high standard.

Kay Colthorpe

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Change of AuPS Treasurer

I have completed my term as Treasurer for the Australian Physiological Society and hand over to the new AuPS Treasurer, Associate Professor Stefan Bröer (ANU). I am greatly honoured to have served in this position and I believe, with the aid of a dedicated council, much progress has been made. We have a bright financial future. The Society enjoys a healthy surplus and its investments are well positioned to capitalize on economic growth. We are growing in membership, quality of the annual meetings, and overall presence in both national and global arenas. The Society continues to work tirelessly to influence academic, industry and government decision making. New collaborations and ventures are firmly on the radar screen, with the formation of strong links to international bodies such as the American and British Physiological Societies in progress. Physiology therefore offers great opportunity in this country and it is our responsibility to ensure that the discipline retains its important place on the national landscape.

I would like to take this opportunity to sin-

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cerely thank my fellow members of council and colleagues and friends for their support during my period of office. To several people in particular, I would like to express my gratitude. To Dave Davey for his endless hours of work and effort, the value of which may never be fully appreciated. I would like also to thank colleagues Rick Lang, Dirk Van Helden and David Adams for their loyal support over the years, and former treasurer David Allen for his generous assistance.

As one of the oldest and most prestigious societies in Australia, the Australian Physiology Society is a benchmark in terms of its dedication to the academic discipline, its role as a fertile ground for Australia's most eminent scientists, and the collaborative links and friendships that exist between its members and beyond. I wish the new treasurer all the best in this privileged and most important executive position. Best wishes to all.

Craig Neylon

Phys Soc - AuPS Exchange Lecturer

It was a privilege to be appointed the Australia-UK Exchange Lecturer. With trepidation due to delays in organising the UK schedule, I left for the UK on the 2nd December 2005. After an unexpected delay of 24 hours, I arrived in Dublin to be greeted by the eminently hospitable Professor Chris Bell. During my days in Dublin from 4-5 December, not only did I deliver the first version of my lecture entitled "Mind, motor cortex and motoneurons: the drive to human muscles in exercise", I also met a number of physiologists within the department and some engineers and imaging scientists who were collaborating with members of the department. It was especially interesting to see the links being made between the Department of Physiology of the Faculty of Health and Sciences and other departments within the University.

My next visit was to physiological colleagues at the University of Glasgow. This visit was hosted by Margaret Gladden, whose work on



muscle spindles I had admired for many years. Indeed, I have visited this department when Professor Ian Boyd was its head, and I was in the first year of my doctoral training. My lecture was followed by some excellent Scottish hospitality. Spinal cord neurophysiology remains the strength among this group of physiologists and it was excellent to hear of the latest work being done by John Riddell, David Maxwell and their colleagues.

Subsequently, I travelled to Manchester where a detailed program of visits organised by Professor Mark Dunne was undertaken. It was gratifying to see the vibrant atmosphere in the Faculty of Life Sciences at the University under its dean, Professor Alan North with the University's research vice-president, Nancy Rothwell. Members of the various experimental groups seemed to be spread widely around the Stopford Building and further afield into two of the new adjacent buildings. I had fruitful meetings with many senior and junior physiologists and learned much from these exchanges. Given one of the local strengths is cardiovascular physiology, I modified my presentation to try to keep David Eisner and colleagues interested.

Prior to the Focused Meeting at University College, in London, on "The Neuroscience of Human Movement in Health and Disease", I visited Oxford and then Cambridge. My time in Oxford was quieter than expected due to Medical intake interviews, but I visited colleagues at the Centre for Functional Magnetic Resonance Imaging of the Brain and had very pleasant discussions with Peter Matthews.

In Cambridge, I was again kept busy with a number of formal and informal discussions. Again it was fruitful to hold discussions with senior physiologists whose approach, being more cellular, is different from the integrative human neuroscience approach that I usually use. A number of motor control issues were discussed with Steve Edgley (who hosted my visit), Dan Walpert and Roger Carpenter. Again, I amended my presentation, this time to include some of the pioneering studies performed locally by Pat Merton. I arrived in London for the two day Focused Meeting and was impressed with how excited everyone was. Part of this arose from the fact that this Special Interest Group had not formally held a meeting together and there appeared to be

much pent-up motor control neuroscience that came gushing out. All the invited presentations included new work and provoked animated discussion.

Dr Phillip Harrison is to be thanked for arranging the meeting. I delivered the opening lecture "Integrative behaviour of human inspiratory muscles: some surprises". I enjoyed the opportunity to present integrative neurophysiology about human breathing to a broader motor control audience. The luminaries in the audience including Professor Tom Sears were also quick to point out my errors of interpretation. The untimely death of Nick Davey was marked with an eloquent lecture by his long-time colleague Professor Peter Ellaway.

The visit has provided me with an interesting snapshot of British physiology in 2005. Many of the challenges it faces in terms of being relevant to science and medical causes are being addressed in different ways at the sites that I visited. While the funding pressures are different in the UK and Australia, there are some lessons to be learned about how our colleagues group themselves together and maximise their impact within the university and government environment.

Simon Gandevia

Prince of Wales Medical Research Institute

NEW APPOINTMENTS



Dr David Wilson has recently been appointed as a lecturer in the Discipline of Physiology, School of Molecular and Biomedical Science at The University of Adelaide. David completed his PhD at the Institute of Cardiovascular Sciences, University of Manitoba, Canada. He undertook post doctoral training at the University of Calgary, where he was subsequently appointed as a Research Assistant Professor. David's research interests are in vascular smooth muscle and the cellular signalling mechanisms involved in both cellular proliferation and Ca²⁺ sensitization. Understanding these processes has implications for treating conditions such as restenosis, angina, hypertension and stroke.

Obituary:

E/Professor Michael Gleeson Taylor
AM, MD BS (Adel), PhD DSc (Lond), MM (Syd)
Hon.DUniv (Syd), FRACP, (1926-2006).



The Australian Physiological Society has lost one of its most distinguished members with the death of Emeritus Professor Michael G. Taylor on 10 January 2006. Michael Taylor, a medical graduate of The University of Adelaide, was appointed

Senior Lecturer in the Department of Physiology at the University of Sydney in 1960 and became Professor in 1961. He retained the title until his retirement in 1991 when he was awarded an Emeritus Professorship. He served as Chairman of the Professorial Board (1969-1973) and was Deputy Vice-Chancellor (1975-1991). He was a founding member of the Australian Physiological Society and the Treasurer of the Society from 1964 to 1967.

Michael had obtained an MD at The University of Adelaide in 1954. He then went to London on a CJ Martin Fellowship and worked at St. Bartholomew's Hospital Medical School with Donald McDonald. This research earned him a PhD in 1959 in the area of cardiovascular physiology. From his earliest years he had shown exceptional mathematical ability and this he applied to problems in haemodynamics, first at Bart's and later at Sydney. This work of Michael is first-class and of enduring quality. Perhaps the best indication of Michael's talent and early achievements in the field of haemodynamics is the following quotation from the Acknowledgements section in the first (1960) edition of '*Blood Flow in Arteries*' by Donald McDonald:

"Taylor, with a training in medicine and physiological research has also a passion for mathematics such that he is technically the equal of many professionals in this field. If I do not here sufficiently express my admiration and gratitude for his contribution to this work, it is only because, while we are exhorted to speak only good of the dead, it is deemed fulsome (or at

least un-English) to speak too well of the living – especially one's close friends. Let it suffice to say that the organisation of the ideas on wave reflection and arterial input impedance (the chapters in the latter part of this book) are almost entirely due to discussions with him."

Donald McDonald is credited with the practical introduction of harmonic analysis into arterial haemodynamics. His interest was in arterial segments and pressure gradients over short lengths of artery. Michael expanded this limited approach to the whole vascular bed, then to the whole vascular tree, explaining thereby the influence of wave reflections and neurohumoral control. He expanded Fourier analysis with regular heart rate to frequency spectrum analysis over a wide range of frequencies and used his formidable 'passion for mathematics' to model vascular beds and to explain the relationship between blood pressure and blood flow in a wide range of species, and under different physiological conditions. Michael Taylor was also a pioneer in applying methods of spectral analysis in the field of neural control of the circulation. As an example of the quality and importance of his work, one of Michael's papers (Learoyd and Taylor, *Circulation Research*, 18:278-292, 1966) described and explained the alterations with age of the viscoelastic properties of arteries. This paper continues to be cited very frequently in the clinical literature, because of its continuing relevance to understanding the causal factors that contribute to hypertension and stroke. It is an excellent example of the application of basic research in physiology to understanding the causes and treatment of disease.

Michael encouraged his students to think broadly and develop their interests in subjects outside the narrow field of their research. Many of Michael's former students have gone on to make major contributions in the fields of haemodynamics, cardiovascular control and clinical medicine.

Michael was an extremely kind, generous and tolerant person. On one occasion a student, working in the laboratory above his office, allowed the sink to overflow with the result that a large quantity of water cascaded down the walls of Michael's office and created an unholy mess. Most people would have hit the roof. The

strongest reaction from Michael was his remark "She didn't even apologise."

Michael married Mary Scott, herself an esteemed physiologist, in 1967 and they set up house in Hunter's Hill. They soon established a reputation for gracious hospitality and eclectic entertaining. Michael was as much at home in the Arts scene as in the Medical and Scientific arenas; he had a passion for literature and languages and had won the Tennyson Prize for Poetry in Adelaide. At the Taylors' parties you never knew whom you would speak to next; it might be a novelist, a chemist, or a music critic. This tradition continued when the couple moved to Burradoo (near Bowral) in 1997.

Michael had an extraordinary range of interests. He played the piano and even composed an opera, which had a performance, albeit by an amateur group. He played the harpsichord, which he had built from a kit. He learned pottery. Many friends of Michael and Mary will remember their pottery parties where hospitality was combined with displays of Michael's creations, which were for sale but at very modest prices. Many of us are proud possessors of a 'Taylor' pot, a constant reminder of his skill and hospitality. In later life Michael took up Chinese brush painting and calligraphy.

Michael Taylor leaves an indelible mark on his many students, colleagues and friends. All of us will remember Michael as a very compassionate, gentle, extremely gifted and very humorous person, and he will be greatly missed.

**Liam Burke
Roger Dampney
Michael O'Rourke**

Emeritus Professor Burke was a colleague of Professor Michael Taylor in the Department of Physiology throughout his tenure. Professors Dampney and O'Rourke were PhD students of Professor Taylor. The authors thank Mr David Coffey, Michael's cousin, for his help in writing this obituary.

The image shown here is the portrait of Emeritus Professor Taylor, painted by Frank Hodgkinson, which hangs in the main corridor on the ground floor of the Anderson Stuart building, University of Sydney.

A memorial ceremony for Emeritus Professor Taylor will be held in the Great Hall of the University of Sydney on Monday 10 April 2006 at 10 am.

IMPORTANT DATES**23 June 2006**

Deadline for earlybird registration and for abstract submission to attend the AuPS joint meeting with Combio.

24 September 2006

Biomedical education workshop (in conjunction with Combio).

24 - 28 September, 2006

2006 AuPS Scientific Meeting, joint meeting with Combio, Brisbane Convention Centre, Brisbane, Australia.

15-18 October 2006

The 6th Congress of the Federation of Asian and Oceanian Physiological Societies, Seoul, Korea.

This issue of AuPS News has been compiled by Trevor Lewis. The next issue of AuPS News will be distributed to members in June 2006. Any contributions for AuPS News should be sent to Trevor Lewis at: t.lewis@unsw.edu.au

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