

INTERNATIONAL UNION OF PHYSIOLOGICAL SCIENCES

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Report of the President of IUPS to the General Assembly at IUPS2017 in Brazil

- 1) **Thanks to the teams.** First I wish to express my own deep thanks as President, but also the thanks of all who are concerned for the future of physiology, to the great teams it has been my privilege to lead for the last eight years. The IUPS Officers, its Council and the Board of the General Assembly, are formed by hard-working active scientists, who do the work involved entirely voluntarily. The work involved has greatly increased because Executive meetings are now held monthly instead of annually, Council meetings are also more frequent, and the BGA meetings are of course a recent innovation. The dedication of all involved, including the IUPS Manager, has not only been responsible for the Union's effective organisation, but has also enabled me to concentrate on the overall IUPS mission of the last eight years "to return physiology to centre stage". More on that later.
- 2) **Thanks to the members.** I also wish to thank the many member societies and academies around the world that support IUPS. IUPS is your servant. It depends on your financial and administrative support. It can also be the medium through which many initiatives can be achieved internationally that would be difficult or politically sensitive for the national societies and academies alone.
- 3) **Outreach.** Many of the ways in which such initiatives are achieved involve careful diplomatic action, and is mostly unsung. The less fuss made about them, the better. But it is worth noting that IUPS has succeeded, within its limited resources, in its outreach to parts of the world that long to connect with the worldwide community of physiology. The result is that scientists have attended IUPS meetings from countries that formerly had no connection with IUPS. The total membership of IUPS has increased. The Education Committee Report will also highlight some of the important achievements. A great highlight for me was the AAPS Congress held in Lagos, Nigeria, last year. The thirst of the young scientists in Africa for contact with the international community was impressive.
- 4) **Limitations of finance.** IUPS could do much, much more of this kind of activity if it had the resources to do so. IUPS can be the facilitator for outreach activities that some of the richer member societies would almost certainly be happy to support both financially and with people. This could be the basis of a fruitful collaboration between the richer societies and IUPS in the future. The evidence is clear. Areas of the world where IUPS was able to send its officers and committee members dominate the applications for travel grants to attend the Congress. With more resources we could have supported many more deserving applications.

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5) **The Mission.** Now I come to the mission.

- a) **Beginnings.** For me, this started way back in 1993, at the IUPS Congress in Glasgow, where I chaired the Congress Organising Committee. Greatly encouraged by James Black, the Nobel Prize winner for his drug discovery work, we published a book distributed to all delegates to the Congress, called *The Logic of Life* (OUP). The subtitle was *The challenge of integrative physiology*. It was published at the height of the hype about the Human Genome Project, and it may have had less impact than it should have had because it was very difficult to press the case for integrative disciplines like physiology while the case for the reductive purely DNA-centric approaches was so appealing.
- b) **Post-genome situation.** The sequencing of the human genome, and the ability to compare it with that of other species was a watershed. At last it became possible to produce genome-based trees and networks of the evolution of species. That ability has been of invaluable service to biology generally. At the same time, however, the success of genome sequencing revealed some deep problems. The correlations in genome-wide association studies turned out to explain far less than we may have hoped. And the promise that within a decade the cures for many diseases would be forthcoming simply was not fulfilled.
- c) **Deconstruction of dogmas.** Meanwhile, a major conclusion was beginning to emerge. Molecular Biology began deconstructing its own dogmas, including the ‘Central Dogma’ that information flows only one way from DNA to the organism. It also became evident that the Weismann Barrier (the idea that the germline is protected from organism or environmental influences) is not absolute, and that other processes in addition to those formulated by 20th century evolutionary theory could have contributed to the evolutionary process.
- d) **New Trends in Evolutionary Biology.** This was the title of a major Discussion Meeting hosted by the national Academies in the UK, The Royal Society and The British Academy. Held in November 2016, the outcome will be a series of articles in a themed issue of one of the journals of The Royal Society.
- e) **Physiology returns to centre stage.** The outcome is that physiology necessarily returns to centre stage in the biological sciences. Once the Weismann barrier is breached, as it is through the discovery of a number of mechanisms, the way opens for functional organisation of organisms to become important in the direction of evolutionary change. These developments are fundamental. We are witnessing one of the biggest changes in biology in recent times.
- f) **An opportunity.** These developments create a great opportunity for the physiological sciences. Already, physiologists concerned with the maternal and paternal transmission of health and disease are collaborating with biologists working on trans-generational epigenetic changes. There are many more examples of physiology permeating disciplines that have not connected with physiology for many years. Those examples will grow in the years to come.

As I step down from the office of President of your Union, I intend to continue to support the cause, cheering my successors from the side-lines, but also continuing the exciting debates and discussions with many biological scientists who would not normally think of themselves as physiologists. We have a great opportunity opening up for our discipline. Let's encourage the young physiological scientists who will succeed us to rise to the challenge. The twenty-first century view of nature is already very different from what we were taught as students.

A handwritten signature in black ink, appearing to read "Denis Noble". The signature is fluid and cursive, with the first name "Denis" being more prominent than the last name "Noble".

Denis Noble

June 2017