

# **A proposal to refocus the activities of the School of Biological and Chemical Sciences within Queen Mary, University of London, 2012-2020**

John F. Allen

School of Biological and Chemical Sciences, Queen Mary, University of London

12 February 2012

## **What are we doing?**

“A plan with targets so soft that it is in effect a self-fulfilling prophecy is pointless. So, too, is one where the aspirations and aims are so lofty as to be remote from any realistic prospect of success.” – Sir Nicholas Montagu, Chairman of Council, Foreword to Strategic Plan 2010-15 [1]

The proposed restructuring of SBCS of December 2011 [2] manages the seemingly impossible task of walking into both of the pitfalls Sir Nicholas describes. The previous SBCS proposal is soft and self-fulfilling because it has no defined objective, nor a date by which it can be judged to have succeeded or failed. The proposal is unrealistic because the changes it describes are unworkable.

In complete contrast, the College’s Strategic Plan [1] provides a clear description of important goals, and of the means by which they will be achieved. ***It also recognises our most valuable asset in the School of Biological and Chemical Sciences (SBCS).***

To quote Sir Nicholas again (but with my italics):

“The plan in this document ... sets out an ambitious vision over the next five years for a constantly improving process of knowledge creation and dissemination, together with the values and supporting activities that are critical to success. That vision is attainable, but will require a high level of commitment and determination to make it a reality. ***We are lucky to have those qualities in abundance among our staff.***” [1]

## Why are we doing it?

“In developing our strategic imperatives, we are guided by the ideal – unchanged for centuries – of a university as a centre for the development of fundamental ideas and the expansion of the boundaries of knowledge, independent of political and other transient opinions. We are conscious also that our obligations to international, national and local communities require our adherence to a set of underlying values and a commitment to the twin aims of knowledge creation and knowledge dissemination – truly a Twenty-First Century interpretation of the university ideal.” – Professor Simon Gaskell, Principal, Introduction to Strategic Plan 2010-15 [1].

## What is the product of our academic work?

Our product is *knowledge*. We *create* new knowledge by *research*. We *disseminate* knowledge by *publication* and by *teaching*. SBCS has been a teaching-led and teaching-dominated department for as long as I have been a member of it (which is since 2005), and clearly for many years before. The word “research” is used in SBCS, to denote a source of income, with little reference to its outcome, which is knowledge. There is nothing in the restructuring proposal to dispel this apprehension. Colleagues have already contributed excellent summaries of the devastating effect the outlined restructuring must inevitably have on teaching, despite its focus on teaching divisions and their expansion. Here I wish to concentrate on even more devastating effects on research output, hardly mentioned at all in the document, and to show how radical restructuring of an entirely different kind is necessary for knowledge creation to prosper in SBCS, rather than to continue to fail.

## Who supports our knowledge creation?

It should be noted that all the money brought in by research flows out again quite rapidly, or should do. We are a not-for-profit organisation. Research funding agencies are being cheated if a surplus accrues, or if money becomes diverted to other activities, or to other projects or departments. Research funding agencies are alert to research effectiveness, and will rightly avoid vain investment in departments that have a consistent record of low returns in discovery and knowledge creation. It was for precisely this reason that HEFCE (previously UGC) devised the Research Excellence Framework, REF (previously Research Assessment Exercise, RAE).

**HEFCE** explicitly provides support for research. HEFCE income is not just teaching income, as widely assumed within SBCS. It is our baseline of research support. **Student fees** will also explicitly support research in all real universities. Their students will know this, and willingly accept this, since it

is their assurance that their teachers are at the forefront of their scientific and academic fields.

**Research Councils** disburse public funds for knowledge creation on specific topics which they judge to be especially deserving of added investment. Research Council income is not the baseline of research support – HEFCE is. Soon, student fees will partly or wholly replace HEFCE. The best students, just like HEFCE and the Research Councils, will not choose teaching-only departments or institutions. We must show that we have a high baseline of world-class research carried out in a cost-effective manner.

**Research Charities and Private Research Foundations** also choose specific projects, and require an assurance of value for money.

**Industrial and Commercial Research Sponsors** also choose specific projects which they consider to be of value to themselves.

**To attract research funding, we must deliver a quality product at a competitive price. We must also demonstrate that this is what we do, and what we have on offer.**

## **The sea-change of 2011 – for better or for worse?**

SBCS has consistently underperformed in research, and radical restructuring is thus necessary, desirable, and a matter of urgency [3]. The School's representatives' response, until 2011, was to deny of the existence of the problem, and to debate irrelevant issues such as metrics [4], as if all that mattered was the appearance, not the reality, of knowledge creation.

In 2011, three years after the disastrous judgement of the 2008 Research Assessment Exercise, SBCS achieved a collective breakthrough in acknowledging that it is failing in research. Unfortunately, the restructuring now proposed will exacerbate the problem, sending most members of academic staff into research, and career, oblivion. Most are fully aware of this. Job applications are rightly confidential. However, amongst friends and colleagues I can think of almost no-one wishing to do world-class research who is also planning to remain in SBCS. And we are continuing to shed promising new recruits at an extraordinary rate. Everything must be done, immediately, to stem this haemorrhage of talent.

## **Which is the way forward?**

Since the 2008 damning RAE result, not much has changed, except the threatened consolidation of a culture of mediocrity. I now outline, and update, specific recommendations [5]. I hope the time is now ripe for reform.

## **Recommendations for any university department [6]**

1. Invest what you can afford in the talent you already have.
2. In appointments, choose able and motivated staff.
3. Trust individuals to decide what they themselves will work on. No motivated scientist will willingly waste his time and resources.
4. Do not trade on recognition, reward and authorship. These are the real rewards of research. Individuals must see, rightly, that they can and will obtain them for themselves, and for each other in collaborative work [7].
5. Provide a supportive infrastructure. If you do not know what one looks like, visit places that excel at science. They will be happy to share what they know.
6. Promote the view that research success is to the benefit of *everyone* in your department. Knowledge is an inclusive good, not an exclusive good. No-one is in internal competition with anyone else - there is no limit to the things we do not yet understand. Celebrate success in research. It is everyone's success. Put your department on the map of world science.
7. Raise confidence.
8. Raise aspirations.

## **Recommendations for the School of Biological and Chemical Sciences, Queen Mary, University of London**

1. Decrease – drastically – undergraduate teaching. SBCS has the profile of a comprehensive school, with ~70 staff and > 1,400 “pupils”. No-one has time for research. Research that actually gets done now is mostly done by proxy, and exploits junior colleagues [7]. Put on your lab coat, do an experiment, and/or go and make field observations and measurements. Do not waste time on administration. It is there to support your research, not the other way round.
2. Allocation of research expenses. This must be individual, and unconditional. It should be equal, pro rata per academic FTE, or the result of a blind formula. It will not be spent “at random”. It should be as much as we can afford. Less than ~£5,000 p.a./staff member is unsustainable. Research costs should not be labeled “Personal allocation”. They must be used for knowledge creation, not as a discretionary subvention to offset teaching and administrative costs.
3. Transparency in accounting. Enables people to know what they have at

their disposal. Erodes mistrust.

4. Stores, stocked and open for every full working day. These will be well stocked with basic research consumables. Demand and will be monitored automatically by computer database stock control, accounts charged automatically, and re-ordering done automatically. "If you need this for you experiment, go to stores and get it".

5. Protect you own, and everyone else's, time and resources for research. Demand secretarial, technical, and administrative support. HEFCE pays for it; you are entitled to it.

6. Research seminars from external speakers. These will be international, not just local speakers, and the best researchers in the World in each person's field of research.

7. Research seminars from internal speakers. We ourselves will become the best in the World in our fields of research. We each need to know what the others are up to. There are wonderful opportunities for collaboration.

8. Sabbatical leave. Mandatory. With 70 staff, 10 will be on sabbatical leave at any one time. Refusal to take a research sabbatical will be a danger sign.

9. Sabbatical visitors. Invite them. With 70 staff, at equilibrium, there will be 10 internationally-renown full time-researcher here on sabbatical leave at any one time. We are in London, too.

10. Research technicians and research assistants. HEFCE-funded, and thus allocated full-time to individuals, scientific projects and laboratories, not working to a dislocated and changing schedule which no-one understands or controls.

11. Cease internal peer pre-view of grant proposals. At best, this practice is a complete waste of time. Instead, ask trusted expert colleagues for advice, ginve in confidence. Breakthrough research has no competitors. Consensus is the enemy of innovation.

12. Teaching-only staff. These are, by definition, unqualified to teach in any University worthy of the name. We are not a secondary school. All academic staff members must do research. This is their job, and their public duty.

13. Bioinformatics. This is a technique, not a subject of enquiry into any aspect of the natural world. There is no data-driven discovery [8-9]. "Bioinformatics" was coined in the 1970s, and had faded from use by 2000. Apart from anything else, we will be living in past. If you want computationally-intensive calculation or modelling, just go on-line. Your desktop already has the capability of a UNIX or VAX cluster when Bioinformatics was new, and the internet outshines anything that anyone could then conceive. You can always collaborate, say, with the EBI Bioinformatics Institute or The Sanger Institute. You have free access to their databases. We are all bioinformaticians now.

## **The real goal and a time-scale. 2020 vision. A testable hypothesis.**

All of the recommendations above are already in place for our intended future peers – the top decile of research-led university departments in the U.K. Implementation of this plan will require a large investment by the College, not just to maintain excellence, but to kick-start a research-first culture that compensates for the current, disastrous legacy of decades of under-investment. There is no point in fudging this issue. You can't get blood out of a stone. This plan will cost. It will be worth it.

REF 2014 [10] is irrelevant. It will inevitably be at least as embarrassing as RAE 2008. There is no point in trying to massage the statistics. We want to be excellent IN REALITY.

If we implement the changes described here, and also decrease student numbers drastically for the intake of 2013, we will still be teaching too much, and examining too much, in 2016. The return on investment will then become apparent by 2019, which is a reasonable guess for the census date of a 2020 REF.

By 2020, the indicators of success, which should not be confused with targets, will be as follows.

1. Outstanding publications in all fields.
2. A queue of intending sabbatical visitors.
3. QM-SBCS alumni moving on to permanent positions in top institutions internationally – or, if in UK, to other institutions in the top decile.
4. Funding agencies applying to us, not the other way around.
5. A handful of Fellows of the Royal Society and members of the U.S. National Academy of Science.
6. One or two Nobel Prizes.

These are all reasonable indicators of SBCS having truly entered the top decile of UK university departments. Anyone can check this assertion by reference to information on comparable institutions, and in the public domain. The plan in the document you are reading is one where the aspirations and aims have a realistic prospect of success. Its objectives are also defined in such a way as to be testable.

Above all, we shall, by 2020, have the confident expectation that QM-SBCS will continue into the mid- an late-21<sup>st</sup> century as a sought-after international university department, with diverse funding bodies and individual researchers securely interpreting clear and unambiguous signals that SBCS is a place where knowledge is created and grows, changing our understanding of the World, thereby to elevate the human condition.

## References

1. Queen Mary, University of London (2010). Strategic Plan 2010-15. <http://www.qmul.ac.uk/docs/about/32329.pdf> Accessed 12 February 2012.
2. Anon. (2011). Proposal to refocus the activities of the School of Biological and Chemical Sciences. Internal document of 23 November 2011, Queen Mary, University of London.
3. Allen, J. F. (2008). Open letter on research and how to promote it in a university. School of Biological and Chemical Sciences Document SBCS 4/0809. [http://jfallen.org/download/open\\_letter\\_to\\_research\\_strategy\\_group.pdf](http://jfallen.org/download/open_letter_to_research_strategy_group.pdf) Accessed 12 February 2012.
4. Lawrence, P.A. (2007). The mismeasurement of science. *Current Biology* 17 (15), R 585.
5. Allen, J. F. (2008) Research and how to promote it. Document of 15 September 2008. [http://jfallen.org/download/research\\_and\\_how\\_sbcs\\_2008\\_09\\_15.pdf](http://jfallen.org/download/research_and_how_sbcs_2008_09_15.pdf) Accessed 12 February 2012.
6. Allen, J. F. (2010) Research and how to promote it in a university. *Future Medicinal Chemistry* 2 (1), 15-20.
7. Lawrence, P.A. (2002). Rank injustice. The misallocation of credit is endemic in science. *Nature* 415, 835-836.
8. Allen, J. F. (2001) Bioinformatics and discovery: induction beckons again. *Bioessays* 23, 104-107.
9. Allen J. F. (2001) In silico veritas - Data-mining and automated discovery: the truth is in there. *EMBO Reports* 2, 542-544.
10. Higher Education Funding Council for England. REF 2014. Research Excellence Framework. <http://www.hefce.ac.uk/research/ref/> Accessed 12 February 2012.