

RSB: A unifying voice for the biosciences

The Royal Society of Biology (RSB) was conceived eight years ago by bringing together the Biosciences Federation and the Institute of Biology. **Dr Mark Downs** joined the society as Chief Executive and has nurtured it from its embryonic state, building on the heritage and reputation of the two original organisations, to create a single unifying voice for biology in the UK. Mark recently spoke with us at *Research Features* to discuss the work of the society in championing the study and development of biology and communicating the value of biology to a wider audience.

Put simply, biology is the study of living things. Investigate further and you'll find that modern biology is a vast and eclectic field composed of so many branches and subdisciplines that you'd balk at writing them all down. Representing this collection of disparate sciences is a serious undertaking, the responsibility for which has been shouldered by Dr Mark Downs, Chief Executive of the Royal Society of Biology (RSB). Over the past eight years, since taking up the role, Mark has sought to set clear objectives that serve both the society's individual members and member organisations. Mark is passionate about providing training and support for professionals and students and is proud of the high-profile status the society has earned, which means it can advise on and influence government policy. Mark talks to *Research Features* about the work of the RSB and the importance of educating and engaging the public so that we understand the contribution biology makes in improving life for all.

Hi Mark! What attracted you to the RSB and how are you finding the role of Chief Executive?

What originally attracted me to the RSB was the subject area itself. My background is in bioscience, so it was nice to come back home. When I joined the RSB – following the merger of the Biosciences Foundation and the Institute of Biology – it was a new organisation and the opportunity to help shape its future was appealing. There was a strong senior level board in place at the time, which showed me that it was a serious organisation that could have real influence and impact. I like the concept of bringing together disparate areas of bioscience and representing them in a coherent way.

Can you tell us more about your background in bioscience?

Initially I did a PhD in biotechnology looking at medical diagnostics using DNA biosensors, then spent some time doing research. I went on to do a whole range of other things – mostly unrelated to my bioscience

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background – in policy environments. I've worked on the science policy agenda and in a broader regulatory environment, as well as on environmental legislation for government. In my last role, I was Executive Director of Science and Enterprise at the RNID (now known as Action on Hearing Loss) and looked after its medical and technical research programme. So, I've essentially come full circle.

Can you tell us about the RSB and what it does?

The RSB is a charity – incorporated by Royal Charter – and a membership body with 17,000 individual members and about 110 member organisations. As a charity, we're here to engage and encourage public interest in the biosciences and to support professionals who carry out work in this field. As an organisation, we're a broad church representing everything from molecular science to macro ecology.

A key activity of the RSB is influencing government policy and developing evidence-based policy. We can offer impartial advice to government, the media and others on bioscience-related issues because of the strength of our advocacy roles through our membership, and we support the development of the biosciences themselves.

We place a lot of emphasis on supporting biologists by offering career advice, professional recognition, training and on-going CPD. Our three broad pillars of work are: becoming a unified voice for the biosciences; producing a professional workforce; and having a broader reach.

How receptive is government to what the RSB has to say?

Government has always been willing to listen to us. Although it might not always act on our advice, there seems to be a genuine willingness to engage, and that's good. We have strong links with governments in Westminster, Wales, Scotland and Northern Ireland, and I think that helps us to have a proper dialogue. It's important to stress that although we represent the biosciences, many issues that arise at a strategic level are about science itself and we work very closely with our friends in physics, chemistry and mathematics to deliver a coherent message to government.

Following the merger of the Biosciences Federation and the Institute of Biology, does the RSB have a clear identity?

We spent the first two years establishing the ▶



Sir David Attenborough speaking to TV paleopathologist Dr Alice Roberts at an event at the Science Museum in London which helped the Royal Society of Biology to raise nearly £20,000 to support its charitable aims

new organisation and understanding what we meant as a merged body, and then another two years consolidating once everything was in place, followed by three to four years of growth. Seven-and-a-half years on, we have developed clear objectives. The work we do for member organisations – previously forming the Biosciences Federation – and individual members – formerly served by the Institute of Biology – has come together very well.

I think we have a very clear identity. We are always working on raising our profile and making sure more people understand what we do. We do this by having consistent branding, some common values and networking visibility. If you want to be understood and known as an organisation you must be seen at events – not just me, but the whole of the team: the council, committee members and so on – and I think we've achieved that.

The RSB's vision is of a world that understands the true value of biology and how it can contribute to improving life for all. Can you give us a brief overview of the importance of biology and the contribution it makes?

Biology has been described as the science of the 21st century, and I think that's almost certainly true. Society faces many grand challenges that have biology at their heart, and understanding the value of biology and its contribution is becoming more important than ever. Take climate change, for example: it has an impact on biodiversity, food and crop production as well as human health. Tackling it is a massive challenge and biology plays a key role in that. In the areas of human health and disease, we are also extremely active playing our part to ensure, for example, society as a whole rises to the challenge of antimicrobial resistance. Bioscience is at the heart of having clean water, good quality food, and ensuring that we have biodiversity in the spaces we want to enjoy and in understanding the wider value the diversity of species bring.

On the RBS website, it states that the society is active in policy for science and science for policy. Can you explain what that involves? Policy for science is about ensuring that the right environment exists to support science, especially bioscience. This includes things such as science funding policy; how immigration policy might affect the free movement of people to work in science; and the regulatory environment determining whether you can release a genetically

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Chief Executive of
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modified organism or a use stem cell treatment. In fact, the whole Brexit debate will affect the way in which science is carried out.

Science for policy is essentially about using science to inform policy in a whole range of areas. What we do in terms of climate change needs evidence to inform the policy. If we're going to have a policy around vaccination or clinical disease, we need the science underpinning it to indicate what the policy should be. In health care, we need to understand the value and impact of a medicine to plan and decide on how and if it should be used, and we need the science to guide policy makers on that decision.

The RSB runs activities, such as Biology Week and Citizen Science projects, designed to encourage public engagement. Can you tell us more about them?

Yes, Biology Week usually takes place in

the second week of October each year and involves hundreds of events around the country celebrating the biosciences, they could be lectures, field trips, or debates. Now in its sixth year, Biology Week is the focus of a range of activities that have been on-going throughout the year.

Citizen Science is very much about encouraging people to look at a subject and to get involved. In the past, we've looked at flying ants and have asked the public to log sightings of flying ants in July and August – which is when they usually emerge – and put the data on our website. This collection of information allows us to see if there are any patterns, perhaps revealing things that weren't known before. We can obtain useful information about a specific topic, but more importantly, it's an easy and effective way to engage people in biology who wouldn't necessarily do so otherwise.

For a project on house spiders, we developed an app that allowed you to identify and log sightings of spiders. An estimated 50,000 people downloaded that app. We've also studied starling murmurations, looking at the way in which they form and if they are associated with birds of prey or particular times of day.

At other times in the year you'll find the RSB at music festivals – where you might not necessarily expect to see us – talking to people about science. We have 16 branches of the RSB across the UK, carrying out dozens of public engagement events each year. Recently we've run an event called Come Dine with the Future, which involved a debate about foods of the future and what they might look like in 20, 30 and 40 years' time. The event took place in Cardiff and gave us some challenging opportunities for eating – insects for example. If they're cooked in the right way, they aren't as unpleasant to eat as you might imagine. But I think it would be too much to state that they're the solution to feeding the world.

Did you find out anything you didn't know before through the Citizen Science projects?

Yes, we did. The best example of that was our flying ant survey. It was accepted by the scientific community that flying ants come out of their nests and fly on a particular day each year. However, the data from the survey showed that there were in fact several flying ant days each year. This research has been written up in an academic paper, which is due to be published later this year.

Do you think the various disciplines within the sciences are good at communicating with each other?

I think over the last 10 to 15 years, scientists have got better at understanding the language of different fields of science. But a lot more integration is needed as we go forward. The area where we've seen the most significant change is in the use of mathematics in the biosciences. It is no longer the case that people choose biology because they don't want to tackle the maths associated with physics and chemistry. With the advent of big data, and far more statistical work, you have to engage with mathematics in the biosciences. Understanding the language of maths is critical in all subjects.

What is exciting you most in biology at the moment?

There are many things happening in biology-related fields right now, but I suppose the



Jo Johnson speaks at the 2015 Parliamentary Links day, which brings together MPs and scientists to discuss the challenges and issues facing science and policy

area that I'm most excited about is gene editing. We have spent years identifying and learning about the genetic basis of diseases and the mechanisms by which they work, and of course the genetic traits that mean crops or livestock might fail or thrive in certain conditions. By making very small changes to genetic code we now have the possibility of a solution to some of these problems. The precision of the technique is incredible. If we get it right and we can get society to understand the value of gene editing, I think it could be transformative.

What challenges do you think the next decade holds for the RSB and the biosciences in general?

Well, I think there are a number of challenges. The RSB and the sector in general will need to address a move away from traditional subjects and recognise the multidisciplinary nature of research. More and more research is being carried out in a multidisciplinary way, both domestically and across international borders. Scientists, and even bioscientists, tend not to say, "I need a biochemist, I need a microbiologist, I need a physiologist". They say, "What's the problem we need to solve and what skills do we need to address that problem?" And they come together as a group, as a research team – either virtually or

in the same place – to solve the problem. We also need to work on developing a skilled workforce – without one in place it will be difficult to deliver science in the way we would all like. This is important not only in academic research, but also in the private sector whatever the field might be, whether it's water-quality control, environmental monitoring, or food science.

•For more information on the RSB and how to join, please visit their website at www.rsb.org.uk.



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