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MUSEUMS AND EVOLUTION

Talking About Evolution in Natural History Museums

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Abstract The Natural History Museum's approach to conducting learning conversations about evolution with visitors in the galleries is described. Potentially difficult scenarios were identified, and training was developed for education staff and volunteers to enable them to engage visitors with a range of motivations and beliefs. Workshops and discussion events focusing on evolution, which form part of the museum's education program, are also described.

Keywords Natural history museum · Learning · Evolution · Training

The great biologist Theodore Dobzhansky said that nothing in biology makes sense except in the light of evolution. In 2009, many museums across the world celebrated the enduring legacy of Charles Darwin, whose theory of evolution by natural selection is one of the most powerful and elegant ideas in the history of human thought. Breathtaking in its simplicity and in its explicatory power, it illuminates humans' place in nature and our interdependence with other species.

No scientific theory has been more scrutinized than Darwin's since it was published 150 years ago. No scientific evidence falsifies it. However, evolution by natural selection is increasingly socially and culturally divisive. In a 2006 Ipsos MORI survey of over 2,000 participants, only 48 % of respondents said that natural selection was the best explanation for the diversity of life. This suggests a widespread lack of understanding of the scientific process and the nature of evidence. Educators in both formal and informal situations can struggle with the nuance of communicating a complex scientific idea such as evolution, which is not scientifically controversial, although like any active area of research, there are unanswered questions within evolutionary science. In this article, I describe how the Natural History Museum in London prepared its educators for Darwin year in 2009, and the program of gallery workshops and discussions about evolution that form part of our education program for schools, adults, and families.

Engaging museum visitors with evolution is a tremendous opportunity to reveal how science works and to inspire wonder at the power of scientific thought. It is also a challenge for museums, where communicating the evidence for evolution can conflict with faith-based views of the world and where many people have a strong distaste for the social misappropriations of Darwin's theory, such as eugenics. As a museum of science, the Natural History Museum is committed to engaging visitors with the natural world and with scientific evidence. We recognize that there are faith-based views on the development of life, but we do not promote these as alternative, equally valid narratives to the theory of evolution. Where visitors raise faith-based views in conversation in the galleries with our educators, we present the scientific evidence in a friendly and respectful way and do not engage in debate. We do provide opportunities for debates about science and faith elsewhere in our public program.

At the Natural History Museum, we anticipated becoming a focus of attention in Darwin year. Our scientists and educators thought long and hard about how we could balance our position as a museum of science with our desire to welcome and engage visitors with a range of beliefs and motivations. Although visitors have always come to natural history museums to explore evidence for evolution, to reconcile science with their faith, or to seek confirmation for their own view of the world, we were preparing for a significantly increased level of scrutiny and intensity in 2009.

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In our galleries, visitors can find compelling evidence for evolution—from the pentadactyl limb, or the evolution of ammonites, to the thousands of specimens in our hands-on science center *Investigate*. Such evidence enables visitors and students to form and test their own hypotheses.

While the specimens and their gallery interpretation invite reflection on evolution, it is the conversations between educators and visitors about our specimens that offer the greatest potential for stimulating interactions about evolution—and the greatest risk of conflict or misunderstanding or offense. During Darwin year, hundreds of spontaneous, unscripted conversations about evolution took place between visitors and gallery educators, and we devoted a lot of energy to ensure that education staff and volunteers were confident in engaging visitors with the evidence for evolution in potentially difficult situations.

We began the process of building the skills and confidence of our educators in 2008 by asking the gallery educators about the interactions that they already had with visitors about evolution, and where they felt that they needed more support. Three key areas were identified: fossil evidence and deep time, evidence for natural selection, and evolution and faith.

The museum had prepared a position statement on evolution as follows:

> The study of the diversity of life on earth is at the very heart of the Natural History Museum. As a scientific organization we are committed to the principles embodied in the scientific method, which tests ideas with empirical evidence. We consider the theory of evolution as the best current explanation for how the diversity of life around us came to be. Through the late nineteenth and entire twentieth centuries the theory of evolution by natural selection has been thoroughly challenged and tested across a range of scientific disciplines and it remains the only compelling, scientifically rigorous account of how life evolves on our planet for which a great deal of empirical evidence has been accumulated.
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> The Museum's policy for public engagement is to present the theory of evolution as the best explanation, which is supported by rigorous scientific examination, of the ongoing generation of the diversity of life on earth.
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> We strongly endorse the teaching of the theory of evolution in UK schools as a core part of the science curriculum and we use the Museum's assets to support this. We agree that views such as creationism and intelligent design should not be taught as 'science', as the Department for Schools Children and Families has recently stated.
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> While we assert that the theory of evolution frames how we understand the world, we do recognize that there are faith-based views on the development of life. The Natural History Museum encourages discussion and exchange of such views in our science and society program.

We had to build on this statement and agree upon an approach to a range of frequently occurring gallery conversations on evolution. From the gallery educators' experience, we constructed five scenarios. These ranged from a teacher asking us to change the content of workshops to omit evolution, to visitors telling gallery educators that they did not believe in evolution.

We brought together a museum-wide group, consisting of evolutionary scientists, educators, and diversity experts for two workshops which were externally facilitated. We worked through the scenarios to develop an appropriate response to each that would uphold our scientific credibility and retain visitors' engagement wherever possible, giving them the evidence to come to their own conclusions. We recognized that visitors control their own experience of the museum. From the workshops, it became clear that the quality of the conversations would depend on our educators' ability to communicate the evidence for evolution, their courtesy, and their skill in avoiding getting drawn into an argument.

From this work, we developed a day's training for our face to face educator teams, with the aims of building their knowledge on evolution, and giving them confidence to have high-quality conversations by working through the scenarios. Getting to grips with the complexities of evolutionary biology and gaining confidence in navigating difficult conversations are tough tasks, and the training has evolved significantly since its original conception. Although this was resource intensive, the investment of time and thought has been valuable—our educators felt confident and were able to conduct conversations with proponents of intelligent design where they felt able to point out scientific errors in their assumptions and present accepted evidence.

In the spontaneous gallery conversations that I have described above, we presented the evidence for evolution and politely avoided long debates where evolution is pitted against other explanations for the diversity of life. It is, however, a crucial part of the museum's work to explore the relationship between science and society. In relation to evolution, this meant providing opportunities to explore its social and cultural impact. As part of the Darwin 200 celebrations, we developed a series of evening discussions to investigate some of the controversies and legacies surrounding Darwin. The Discussing Darwin events began by exploring the relationship between science and Christianity with a packed audience. We followed this with an investigation of the possibility that there was a moral impetus behind Darwin's theory of evolution—a belief in human

brotherhood and a conviction that not only different races but all species are members of one family, with a shared ancient ancestor. These were very popular, sellout events, reflecting a real thirst in many people to understand more about evolution and its impact, and to share their views. In developing these events, we were adamant that we wanted debates and sought out speakers who could communicate the complexity and nuance of these sometimes difficult topics. We did not want a creationist and evolutionary scientist talking at one another with no common ground, believing that this would be sterile and unsatisfying for the audience.

Along with Oxford University Museum of Natural History, who developed this workshop, we run sessions for 14- to 16-year-old science students that recreate the Great Debate of 1860. It builds on the English national curriculum for science and uses the unique specimens in our galleries as a focus for whole-class debates about the interpretation of the specimens as evidence for evolution.

Students recreate the famous Huxley and Wilberforce evolution debate of 1860, which took place in Oxford University Museum of Natural History. They imagine that the key historic characters were alive today and use the galleries' exhibits as evidence for or against evolution, doing presentations on behalf of one of the debate's key characters.

Students point out particular bones and features to their classmates while presenting, to make their point. They can see that the specimens, their structure, and their similarities to or differences from humans are interpreted differently by the groups, depending on whether they are arguing for or against evolution.

We are therefore directly using museum specimens to support a difficult concept, that evidence can be interpreted differently depending on viewpoint, or belief. We discuss the need for the peer review process in science, for scientists to check each other's work and ensure that interpretations of evidence are not influenced by bias or personal belief. We are directly using the specimens and the historic controversy surrounding the publication of the *Origin of Species* to help students understand what science is.

This enables us to discuss the limits of science—that there are some questions that science cannot currently answer and some that science cannot address, which is a key curriculum point. The plenary discussion also includes the question "Which comes first, the theory or the evidence?" and a lively debate usually follows. The historic context, the evidence for evolution physically surrounding the students, and the example of a world-changing theory provide the spark for getting to grips with and understanding complex, higher concepts—discussions which would be equally at home in a university philosophy department.

In conclusion, at the Natural History Museum, we have chosen not to spark debate about evolution and society through our galleries. We decided that placing evolution alongside origins narratives in galleries would not provide the quality of engagement that we seek, and that this is better provided through structured opportunities for conversation and debate. As a museum, we are in the unique position to welcome visitors from a variety of backgrounds and explore with them areas of shared interest and understanding. With a dynamic, imaginative public program, a museum of science can become a productive and exciting place for such discussions and exchange of views.

Coming to an agreed position about how we talk about evolution at the Natural History Museum has been an exciting and challenging process. This does not mean that we get every interaction right or satisfy ourselves and every visitor. As Darwin Year began, we felt ready to engage thousands of visitors with evolution and its social and cultural impact, providing them with the evidence for evolution, building the skills to make up their own minds, and making space for debate about the relationship between science and society.

In the event, with two years of hindsight, our educators and science communicators encountered very little antagonism and had relatively little opportunity to put their training into practice. Most visitors, in contrast to the Ipsos MORI (2006) poll mentioned at the beginning of the article, were eager to learn more about evolution and engage in constructive and friendly discussion with museum educators. However, the process of thinking deeply about how we communicate evolution, and retain visitors' engagement in gallery conversations, has built the skills, knowledge, and confidence of our educators and has had a lasting impact on the quality of learning conversations in our galleries.

Reference

Ipsos MORI. Poll for the BBC on the Origins of Life. January 2006.