

Astrotour 2010: A retrospective

David Ault
Former Director, The Big Bang
East and West Midlands

UK
 @astrotour2010
 david@davidault.co.uk
 www.davidault.co.uk

Keywords

Science museums, science centres, public engagement, science communication, outreach, North America

Summary

This article looks back at my four-month trip visiting science centres and museums across North America, illustrating the examples of best practice I found whilst there. This is not a commentary of how they are now, but a glimpse into the timeless factors that made them special and brought science alive for the inquiring public.

Introduction

My keen interest in science centres and planetariums began at centres around the United Kingdom: The Black Country Living Museum¹, Dudley; the Birmingham Science Museum (now Thinktank) and Jodrell Bank Discovery Centre, Manchester². The inspiration I gained as a teenager during these visits would underpin my later decision to study for an MSc in astronomy at Jodrell Bank Observatory and further motivate my vocational work in the planetarium at Birmingham's Thinktank³. Between 2010 and 2014 I was director of The Big Bang in the West and East Midlands — the Big Bang being the largest children's

science festival in the UK — and invited the Black Country Living Museum and others to bring the same joy in science, technology, engineering and mathematics (STEM) to new audiences of budding scientists.

In 2009 I decided — whilst performing Shakespeare in India — that I would undertake a grand tour of North America's institutions and see how science communication was championed on that side of the pond. In January 2010 I was the proud — and nervous — bearer of a flight ticket to Toronto, flying out on 7 May and returning from San Francisco on 8 September. What would happen in between was anyone's guess but I was sure that there would be

a great deal to discover on the way. I was not disappointed!

As I worked my way around the continent I blogged about my experiences, detailing examples of best practice as I went⁴. I visited large, multi-million dollar museums such as the American Museum of Natural History, New York, USA⁶ and Chicago's Museum of Science and Industry⁷, USA, as well as smaller local institutions such as the Halifax Discovery Centre, Nova Scotia, Canada⁸ and the Woodstock Museum, Canada⁹. I found that the size of the building made little difference to the overall experience; rather three main factors stood out, which for the sake of this



Figure 1. The Exhibit Workshop in the main Exploratorium building in San Francisco. Credit: David Ault

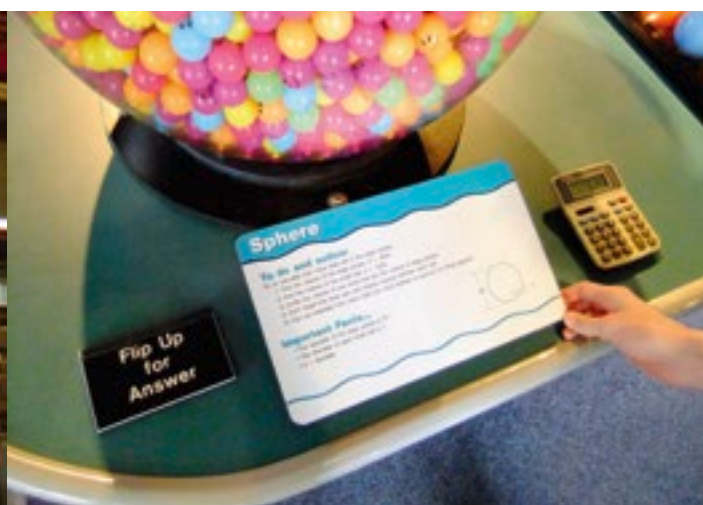


Figure 2. The mathematics of bubble-gum balls at the Great Lakes Science Center — calculator provided! Credit: David Ault



Figure 5. Map showing locations visited during the trip. Credit: David Ault

article I shall discuss under the headings: Locality, Actuality, and Personality.

Locality — Making the most of where you are

It is difficult to pass through Washington DC without a trip to the Smithsonian¹⁰, and particularly the Udvar-Hazy Center¹¹ slightly further out in Virginia. Here you can see the Space Shuttle *Discovery*, marvel at Concorde, and take in a host of other thrilling exhibits. One thing that really inspired me was that the Smithsonian used the advantage of its location to communicate science in action. The proximity of the centre to Dulles Airport gave it an excellent view of the comings and goings of the aircraft. To grant visitors an insider's experience of the daily functioning of air traffic control they make it possible to hear the normally unheard dialogue that directs the intricate proceedings from the control tower. This was such a simple idea, but was extremely effective.

The Three Rivers Foundation¹² at Comanche Springs in the panhandle of Texas was almost thirty kilometres from the nearest village. Gone was the light pollution of the urban sky and in its place the vast expanse of the night sky was revealed in all its glory. It was no wonder then that each month the Foundation hosted star parties where the public were invited to come together and gaze upwards for a time, leaving life's concerns for a taste of awe. It was not, however, only these that drew the crowds. Schools and colleges were also encouraged to bring their students to study astronomy and learn about the rich observable ecology of the local area.

You might be asking, how though did visitors see the night sky in the middle of the day? The Foundation's solution was found in collaboration; teaming up with a similar site in Australia. Both places could now enjoy unspoiled views of the stars via the internet whatever the time of day, and in addition each gained an appreciation of a different part of the sky.

Engaging the community in another way, though not related to astronomy, was the California Science Center in Los Angeles¹³ — which presented the public with rubbish from a 1994 landfill site nearby to demonstrate just how little it had decomposed — and the Great Lakes Science Centre¹⁴ which had taken time-lapse pictures of the bay outside to enable visitors to scroll through the shifting weather systems and seasons of the area.

Throughout my journey I found that those museums that engaged with their local communities and environment had higher return rates than those that didn't, addressing the perennial problem of how to coax back those visitors who had "seen it all before". When the partner museums Science North and Dynamic Earth¹⁵ in Canada were being built, the local community was invited in at the various stages of construction, giving them a sense of ownership over their science centres. They also used the nickel mines that had built the town in the first place, giving a sense of ongoing narrative.



Figure 3. Maryland Science Center's Wonder Workshop. Credit: David Ault

Similarly San Francisco's Exploratorium¹⁶ asked the community to bring in bits of wood, metal and so forth to create the interactive displays. They expanded upon this principle by building the interactive museum displays as a series of prototypes. These were observed through the working day and repaired each evening before repeating the next day. This encouraged visitors to be curious, to play and to touch with a view to sparking their imaginations.

Actuality — Making the most of what you have

When it comes to how to make and showcase what you have there is a distinction to be made between science centres and museums. The latter have collections that

need to be shown, whilst the former can be built simply from an idea. Chicago's Museum of Science and Industry used its massive space to begin to breach this distinction, by placing the interactive exhibits at the heart of the building and allowing those interested to follow the paths further into the building to see the collections.

Allowing the visitor to engage on different levels was an important factor in signage, and was taken up by many centres. The Great Lakes Science Center was one such place. Its display boards gave the headline of what was in front of you, a brief description below that, and further down a more in-depth analysis for the interested reader. Moreover, it was one of the few centres that was unafraid to use mathematical symbols and terminology without apology. I feel that sometimes we shy away from using such

terminology for fear of putting people off, but it may also lose those who could be interested. A long-standing debate, I know, but I would err on more information over less.

There is also a perception sometimes that if it's not on a screen, then it won't be engaging to the under 25s, but in reality using an excessive number of screens can become very costly and science centres are rarely awash with funds. The Woodstock Museum's curators had researched all similar institutions in a two-hour radius to create the most effective displays they could. The museum was thus mostly sign-based but with smatterings of screen-based interaction which worked very well indeed. One simple use of a screen was simply to stream the current science news — in Toronto this became an hourly show which explained the headlines.

In the nearby Cleveland Museum of Natural History¹⁷, my guide told me that whilst the exhibits had changed little since she was a child, the signage had been refreshed, giving the impression of renewal. This is one area to consider if budgets are tight, whilst another was to get local sponsorship for exhibits. The Halifax Discovery Centre started as a touring theatre in a van and kept a rough and ready feel. It was their ingenuity in reusing old exhibits, keeping things as simple as possible and getting sponsorship that I appreciated. They overcame their problems of space by creating a maze with translucent sheeting, and suddenly there was an exciting area with no overcrowding problems!

Do you have some table-tennis balls of different sizes? Use them with implements to start a discussion about beaks and natural selection, demonstrating how the right beak — implement — will be able to pick up the food — table-tennis ball — and survive, whilst those that can't, won't.

A sandpit? That can be a Dino Dig, as in the Dallas Museum of Nature and Science, or

an exploration of the scientific method as in the California Science Center, where visitors could unearth Egyptian pottery and skeletons to then ask themselves how they got there. This was an important distinction for me, because instead of telling people the theory, it invited them to examine the evidence and draw conclusions — essentially, to do the science yourself.

The space itself can also be used in different ways, and this idea was picked up upon my return to the UK. The University of Texas's planetarium in Arlington¹⁸ could be hired out by couples seeking a romantic dinner under the stars. For a modest fee, the in-house kitchens would serve a three-course meal whilst the stars wheeled above the happy pair. A simple reframing of the space, two hours usage of projectors and an unparalleled view!

Another amazing site was the Maryland Science Center¹⁹, with its Wonder Warehouse, where everything was created by the staff out of whatever was around, including the packaging from the previous touring exhibition which was reincarnated

as dividers. The staff were allowed to play, and that enthusiasm was transmitted very quickly to the visitors.

Personality — Making the most of who you have

This is above all the main point that I have to make. Above everything — the exhibits, the tools, the funds, the space, the community — come the staff. When your staff are happy and enthusiastic, your visitors are too. From the moment you approach a museum or science centre, you are being influenced; if the people on the door are bored or stressed, this will start a visit on the wrong foot. I met some amazing individuals on my travels, inspirational people who are unafraid to cross boundaries between the arts and sciences, and let their vision fly.

At Ontario Science Centre²⁰, there are no scientists donning lab coats to provide the explanations of exhibits; they use actors. The rationale is that it's easier to give an actor scientific knowledge than to give

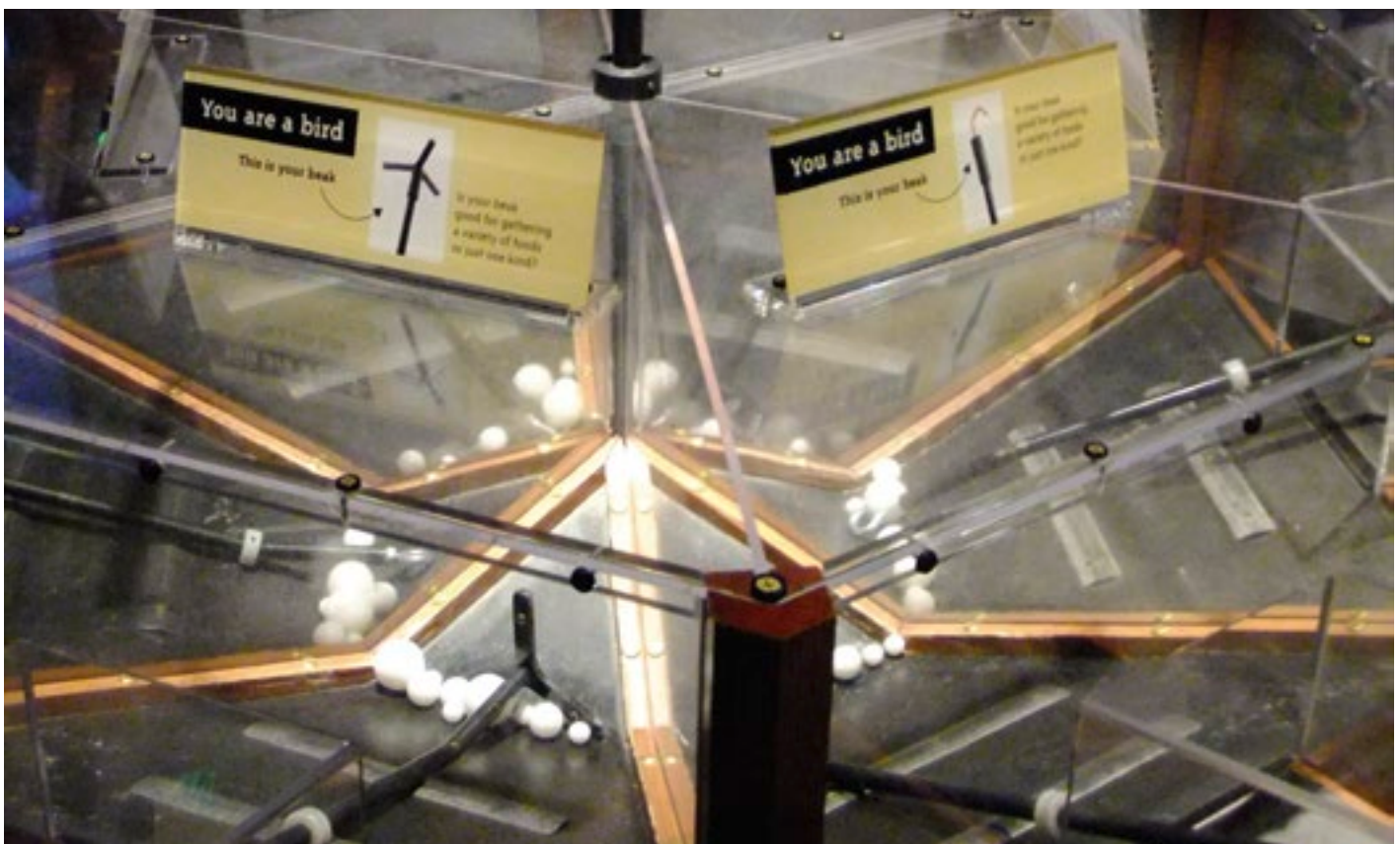


Figure 4. The evolution of beaks as demonstrated by table-tennis balls and implements. Credit: David Ault

scientists presentation skills, and I was swept up in the infectious enthusiasm they had for discovering more about the world around them. As they discovered more, so did the visitors.

The Exploratorium in San Francisco worked with high school students during the summer holidays. If the students didn't know how something worked, they would be encouraged to work it out together with the visitor, or to ask someone who did know. Either way, it was an opportunity to discover, to question and to be curious.

I have mentioned already the Maryland Science Center's Wonder Warehouse, where the staff had free rein over the gallery; in Toronto everyone from across the centre was brought together to decide what interactive display was needed and to come up with prototypes. At Science North and the Exploratorium prototypes were made and improved by the staff on the shop floor, and certainly for the latter these were arts graduates and inventors.

Buildings that were attached to or near a university were able to tap into such local resources. The Halifax Discovery Centre trained up graduates to be part of the roving teams. Arlington Planetarium gave its graduates vital experience and the Ontario Science Centre gave academics research space and time in return for talks and demonstrations.

Even in museums where collections were fixed, staff could be encouraged to be more than just custodians or warders. At the Canada Science and Technology Museum in Ottawa²¹, an old artefact was illuminated on a button push rather than constantly, to limit damage caused by light exposure. Staff then used this as a point of engagement, asking visitors to consider how light affects certain objects. They were also encouraged to have a favourite exhibit and find out more about it, so that even if they did not have ownership over what went into the museum, they could still be enthused by it.

Staff are by far an institution's biggest asset, because it is that interpersonal spark of fascination that will encourage visitors to find out more. The technology at Dalhousie University's Halifax Planetarium in Canada²² was half a century old, but my guide there was as joyful about it as he

could be. In the nearby Bedford Institute of Oceanography²³, real scientists showed me around their work in the bay, just as I was able to see the coveted Sudbury Neutrino Observatory²⁴ and meet everyone who worked two kilometres down that mine day in, day out.

My point being that if staff are given autonomy and ownership, they will, in my experience, reap dividends in terms of their own wellbeing and the experience for the visitors. This was true from the biggest to the smallest, the richest to the poorest centres — it was the staff that made a place enjoyable or not.

Conclusion

Engaged and friendly staff and volunteers, imaginative and relevant displays, and the availability of information at all levels — this is what makes a science centre.

It was Einstein who said, "The most beautiful thing we can experience is the mysterious. It is the source of all true art and science".

There are no boundaries between the two, and it is this sense of mystery and wonder that we are trying to communicate to those who visit our science centres. I was very privileged to travel across North America five years ago and see many different ways of doing just that, and if you would like to find out more about the various places I visited then all the reviews are at: <http://astrotour2010.blogspot.com>.

Notes

- ¹ The Black Country Living Museum, Dudley, UK: <http://www.bclm.co.uk/>
- ² Jodrell Bank Discovery Centre, Manchester, UK: <http://www.jodrellbank.net/>
- ³ Thinktank, Birmingham, UK: <http://www.birminghammuseums.org.uk/thinktank>
- ⁴ The Big Bang West Midlands, UK: https://nearme.thebigbangfair.co.uk/West_Midlands/
- ⁵ The blog of the 2010 tour: <http://astrotour2010.blogspot.com>
- ⁶ American Museum of Natural History, New York, USA: <http://www.amnh.org/>

⁷ Chicago's Museum of Science and Industry, Illinois, USA: <http://www.msichicago.org/>

⁸ Halifax Discovery Centre Halifax Discovery Centre, Nova Scotia, Canada: <http://thediscoverycentre.ca/>

⁹ Woodstock Museum, Canada: <http://www.woodstockmuseum.ca/>

¹⁰ Smithsonian, Washington DC, USA: <http://www.si.edu/>

¹¹ Udvar-Hazy Center, Virginia, USA: <http://airandspace.si.edu/visit/udvar-hazy-center/>

¹² Three Rivers Foundation, Texas, USA: <http://www.3rf.org/>

¹³ California Science Center, Los Angeles, USA: <http://californiasciencecenter.org/>

¹⁴ The Great Lakes Science Centre, Ohio, USA: <http://www.greatscience.com/>

¹⁵ Science North and Dynamic Earth, Canada: <http://sciencenorth.ca/promos/iceage/>

¹⁶ Exploratorium, California, USA: <http://www.exploratorium.edu/>

¹⁷ Cleveland Museum of Natural History, Ohio, USA: <https://www.cmnh.org/>

¹⁸ University of Texas's planetarium in Arlington: <http://www.uta.edu/planetarium/>

¹⁹ Maryland Science Centre, Maryland, USA: <http://www.mdsci.org/>

²⁰ Ontario Science Centre, Canada: <https://www.ontariosciencecentre.ca/>

²¹ Canada Science and Technology Museum, Canada: <http://cstmuseum.techno-science.ca/en/>

²² Dalhousie University's Halifax Planetarium, Canada: <http://www.astronomynovascotia.ca/index.php/planetarium>

²³ Bedford Institute of Oceanography, Canada: <http://www.bio.gc.ca/>

²⁴ Sudbury Neutrino Observatory, Canada: <http://www.sno.phy.queensu.ca/>

Biography

David Ault's love for science centres began early in life, leading him to present in the planetarium at Thinktank, Birmingham's Science Museum. His love of travel sprang from touring Shakespeare around Rajasthan, India, fulfilling a love of theatre that took him to drama school. Upon return from his four-month trip across North America he directed and ran The Big Bang Fair Regional programme in the West and East Midlands. He is currently producing astronomy podcasts, sci-fi/fantasy audio-drama and narrating audiobooks, eager to find the next challenge.