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Of Hate & the
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CHANGING
OUR MINDS?

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THE NETWORK

spokes

- spokes**, noun, plural of spoke
1. One of the rods or braces connecting the hub and rim of a wheel.
 2. *Nautical* One of the handles projecting from the rim of a ship's steering wheel.

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Maker Culture in the Science Centre

WRITER
Andy Lloyd

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features

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SPRING

2013

The explosion of new technologies during the second half of the twentieth century has seen the Western world evolve into a set of mature, consumerist economies. Although the current financial situation raises uncertainties, for most of this time the majority of the population has been content to consume products of an ever more remote industrial system. For many people, the inner workings of most technology they own is a complete mystery. However, there is a growing chorus of disapproval which considers this to be a poor state of affairs. This is the voice of “maker culture”, and the next few years will determine whether it is a fad, a movement, or social change.

Over the last couple of years maker culture has prompted discussion at gatherings of science centre professionals. At the Ecsite Conference in Gothenburg, Sweden in June 2013, it will be a major topic of discussion. Where did all of this originate?

Traditional crafts

Making as an activity is as ancient as Homo sapiens. Traditional crafts – woodwork, metalwork, ceramics, and textiles – have survived industrial and technological revolutions in part because of the value placed on the processes. Although very few of us commission hand-made items for everyday use, there remains something special about seeing a master craftsman at work. David Gauntlett,

Andy Lloyd is Head of Special Projects at the Centre for Life, Newcastle upon Tyne, UK. He is a current fellow of the Noyce Leadership Institute, for which he is exploring how a science centre can stimulate and sustain maker culture in its community.

Professor of Media and Communications at Westminster University, has argued that the act of making things has always served a strong social purpose, strengthening the individual’s sense of self-worth and ability to build social connections. We are moving from a ‘sit-back-and-be-told culture’ to more of a ‘making-and-doing culture’, says Gauntlett in his book, *Making is Connecting*. This isn’t necessarily new, but our growing capacity to connect is accelerating the process by which we engage with the world.

Open Source and the IT Revolution

The information technology (IT) revolution began much like previous industrial revolutions – with enthusiastic experimentation. While early innovation was borne from government and academia, it was in amateur computer clubs that the seeds of modern industry were sown. Major figures like Steve Jobs, Steve Wozniak and Bill Gates were members of such clubs as teenagers when computers were expensive machines and the preserve of large businesses, universities and government departments.

These communities shared their skills and expertise, resulting in much of the software that makes up the Internet. However, as software became a commercial profession as well as an academic study or a hobby, divisions started to show. Bill Gates wrote an infamous “Open Letter to Hobbyists” in 1974 complaining that unofficial copies of his software were circulating freely and arguing that people who create software deserve to be paid for their ef-

forts. Subsequent history shows that while the “paid for” model has been hugely successful, it never quite killed off free sharing.

In the late 1970’s a technical writing consultancy, O’Reilly and associates, established a business producing documentation for companies selling packaged versions of the open-source Unix operating system. From 1984 they held copyright of their manuals and became a fully-fledged publishing company. As active participants in the technology world they grew alongside Silicon Valley and in 1998 brought the benefits of these open technologies to the attention of the wider business community by hosting the “Open Source Summit”. This role, as a “chronicler and catalyst of leading-edge development” positioned O’Reilly in the perfect position of emerging trends watcher as the twenty-first century began.

Make Magazine and Maker Faires

In 2005 Dale Dougherty of O’Reilly Media launched a new venture. MAKE magazine set out to capture the do-it-yourself (DIY) mind-set that Hacker spaces were recapturing from the early days of the IT revolution. The publication quickly found an eager audience of DIY enthusiasts who were busy with technology projects in garages and sheds and it coincided with the birth of social media channels commonplace today (for example Facebook in 2004, YouTube in 2005). These are the platforms through which a new generation of makers were beginning to connect and share projects.

Seeing these projects online and in a magazine is all very well, but in 2006 the publication hosted its first Maker Faire – a large gathering of enthusiasts who show off and celebrate the diversity of things being made. This first event was held in the outdoor showground in San Mateo, California, and attracted 20,000 visitors. The same event welcomed over 110,000 visitors over two days in 2012.

Maker Faires and Science Centres

The Maker Faire phenomenon did not go unnoticed by science centres and museums. Several people around the world recognised the overlap in the interests and missions of these two communities. In the UK, the Centre for Life worked with O’Reilly Media to launch Maker Faire UK in 2009 while in the United States the Henry Ford Museum hosted the Detroit Maker Faire beginning in 2010. The largest partnership to date has been with the New York Hall of Science, host of the World Maker Faire since 2010, which welcomed 55,000 visitors in September 2012. In their home state of California, Make have collaborated extensively with the Exploratorium in San Francisco, with events in the centre and a regular Tinker Studio presence at the annual San Mateo event.

It has been possible for community organisations, including science centres, to host their own one-day “mini Maker Faire” by applying for a license to use the name, branding and online promotion through the Maker Faire site since 2010. Many centres are grasping this opportunity, and we expect to see more in the coming years.

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Maker Faire in Newcastle

So what was it like for us in the UK, starting out for the first time? The Centre for Life had already created Newcastle's Science Festival and had successfully increased the funding available for the programme in 2009. Newcastle has a history of innovation being one of the birthplaces of the Industrial Revolution in the nineteenth century and still boasts expertise in specialist manufacturing from electric cars to underwater robots. The city was already thinking about ways engineering and technology could figure more prominently in the Centre for Life's programme alongside pure science, so the Maker Faire fit perfectly in a city of makers.

The first year's event saw 4500 people visiting about 50 makers - all enthusiasts who spent the weekend showing off their projects. We were pleasantly surprised by how many makers showed up and how far they travelled to attend. The next year, the event was held in the Centre for Life's temporary exhibition gallery which accommodated more makers and nearly 8,000 visitors.

The 2013 Maker Faire is taking place as the author writes this. This year, we are hosting over 100 maker displays accompanied by several hundred makers and over 10,000 visitors will pass through. Makers and visitors travelled from across the UK, Germany, the Netherlands, Italy and even the United States. The event took over every square metre of the science centre, including spaces usually reserved for corporate conferences and school workshops. Even our science show theatre was transformed into a venue for talks from speakers like Dale Dougherty, the founder of Make and Maker Faire, and author and internet activist Cory Doctorow.

Impact on Centre for Life culture

This is a massively disruptive event to host, so why do we do it? The energy derived from the experience of Maker Faire is difficult to describe in words. It's the only Centre for Life event that attracts a core audience of families along with young, technically aware adults, business people, teachers and academics, artists and arts professionals and political figures all at the same time. Even as a technology event, it is remarkably gender neutral, with boys and girls participating equally in sewing, pottery, 3D printing and soldering. At its busiest time, Maker Faire retains a disarming sense of gentleness in its interactions, no doubt due to the genuine pleasure taken by makers from the experience of sharing the fruits of their labour.

As science, technology, engineering and math (STEM) communicators we have taken note of some of Maker Faire's key characteristics. Compared to most of the things we do in our sector, this is not a top-down, strictly curated activity. It is a genuine grassroots movement - the antidote to "worthiness" - and embodies the spirit behind Frank Oppenheimer's words, "Nobody ever flunked a science center".



DIY directions

This year we introduced a DIY Biology strand, with the support of the Wellcome Trust, tying the Faire back to Centre for Life's life science origins. We had support for new start-up businesses including an advice surgery with Kickstarter. We also held our first Maker Pre-school day, giving toddlers a taste of DIY. But now we need to move beyond an annual event to a year-round programme. As our Chief Executive, Linda Conlon, said:

"Events like Maker Faire offer part of the solution. They're exciting and inspirational. This event only lasts two days but we want to ensure that it is the start of something much bigger. We want to partner with business to create a permanent space at the Centre for Life where young people can design, create and build things, where they can meet with industry experts to test their ideas and pitch their prototypes."

So we may look to the lessons of some of our peers, notably the Exploratorium and the Children's Museum of Pittsburgh, and establish a permanent "Maker Space" in place of one of our exhibitions. We may also find a way to channel Newcastle's appetite for clubs and holiday activities to stimulate the maker ethos. Even our core exhibitions have been makeified; our new Curiosity Zone promotes experimentation and creativity as processes with no predetermined outcomes or content. We probably wouldn't have had the confidence to try this without the experience of seeing large crowds engrossed in relatively complex, practical activities. David Gauntlett describes this "everyday creativity" as:

"...a process which brings together at least one active human mind, and the material or digital world, in the activity of making something which is novel in that context, and is a process which evokes a feeling of joy."



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We believe this isn't a fad. We think maker culture and its empowerment of participants, is an indication of where science centres are heading. Particularly for institutions like ours, who are not tied to a historic collection, supporting and sustaining the maker movement can give us a renewed sense of purpose. As Linda Conlon says:

"It's essential that we create opportunities for those young people who have been inspired by Maker Faire and want to explore further"

We won't do this on our own. Maker culture is a product of networked communities, and science centres can participate in these networks too. Our local hackerspace, Makerspace Newcastle, is only two years old but is the product of conversations and connections established at meetings and groups over the previous five years, some of which the Centre for Life had a hand in creating. One of the Makerspace founders, Dr Brian Degger, listed some of these: "Supermondays (a local software developers group), Thursday Fizz (a monthly meeting of media people), Social Media coffee mornings at the Settledown cafe, the Howduino event at Life, Barcamp North East, Hack Days, Dorkbot meetings...". Ours is a forward-looking, well-networked city, but I am sure that your home town is equally talented.

In the twenty-first century, science centres should look to their fundamental attributes to refocus their social purpose. Science centres are a social experience, where people come to take part in enjoyable activities together, develop new skills, extend existing talents, and develop their self confidence and sense of identity around science and technology. Many of our founders, such as Frank Oppenheimer and Richard Gregory, understood this implicitly and the earliest science centres were the product of their joy, enthusiasm and practical talents. In fact, most of them would have felt perfectly at home within the maker movement and it would not be a massive leap to argue that we (science centres) originated with makers. — [April 2013]