

Arts for the Brain – starting point for a journey

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The Brain Awareness week is an international initiative, started more than a decade ago, which aims to encourage all neuroscientists to leave their lab benches and hospital wards behind and come and meet and engage with the public. The University of Birmingham has been organising BAW events for the last few years. The main event of the 2012 series has been the setting up of an exhibition with the title **Arts for the Brain** in collaboration with two important charities working in the field of neuroscience-related diseases: Stroke Association UK and Parkinson's UK. The exhibition, designed by Dr. Emil C. Toescu, supported financially by the Federation of European Neuroscience Societies and the College of Medical and Dental Sciences at the University of Birmingham, and setup in collaboration with **mac birmingham**, presented works of art produced by people that were diagnosed and suffer from these neurodegenerative diseases. The declared intention of the exhibition was to illustrate the importance and power of art in allowing the re-affirmation of individual presence and creative powers as well as in providing specific and successful ways of training and rehabilitation of individuals after suffering significant changes in their health status.

The exhibition program was enhanced by a number of public lectures in which some of the artists displaying were invited to provide a personal perspective, while some other invited scientists talked about what is happening in the brain as a result of the disease, providing a science-informed view on the various signs and symptoms of neurodegenerative diseases. They also presented some of the latest information regarding the new avenues of therapeutic intervention that form the focus of current research.

These public lectures program benefited a lot from the participation of Mark Ware, who also contributed to the exhibition a series of recent works. Mark is an artist with an established artistic portfolio, who suffered a serious stroke almost a decade ago. What makes his contribution particularly special is that after the stroke, he recovered his artistic impetus and the creative juices started to flow again. But, and this was the fascinating experience he talked about in his presentation, after the stroke his artistic experience of the world changed, and that changed also the direction of his creative output. Part of this changed experience appeared to have come from an increased acuity of the sensorial perception, making the world a much more intense experience. Associated with this was an apparent change in the balance between different senses, resulting in him inhabiting a world that was perceived in a different way. Although neuroscience does not have (yet?) the tools and the investigative refinement to provide a detailed description of the reasons for such changes in the subjective experience of the world, such changes illustrate in a powerful fashion the huge and incredible plasticity of the brain, its capacity to adapt, to learn and to make new connections, keeping only the main compass, which is: adapting to survive in the environment. When stroke takes out a small region of the brain, there is the acute need of re-routing and re-organising around, in a literal and figurative way, the region that cannot be used anymore. It is here, in this capacity to explore and experiment in the dark, of establishing initially small foot-holds of connectivity, in the power to strengthen the

successful connections until the outward function reaches a reasonable level of fluency and adaptiveness to the requirements of the environment – it is all this, then, that defines the plasticity of the brain. And Mark Ware’s work and his talking about his experiences in making such work are like windows of observation opened towards such processes.

Such observations reveal another dimension of the importance of scientists’ meeting the public in a process of engagement rather than in the more traditional Enlightenment model of public education. If the scientists are open and listen to the public they will have the chance of discovering facts and views that might not have crossed, otherwise, the boundaries of their labs or wards. Serendipitous observations that might lead to significant discoveries benefit the prepared and open, one could say, paraphrasing a famous dictum of one of the giants of biomedical sciences of the late 19th century: Louis Pasteur. Probably most people will know the famous story of Phineas Gage, the early 19th century American railroad explosives specialist, who made a small mistake and had detonated a 2 inch thick and 3 feet long iron rod through his head, destroying completely his left frontal lobe, but lived to tell the story [1]. As a medical case he was very interesting, and exercised many neurological minds of the time. But the reported dramatic changes in his personality became the focal point of much wider discussions, involving not only neurologists, but also psychologists and philosophers, leading to many changes and reassessments of the theory of mind, then at a very early stage of construction and development. That tradition of careful observation and interaction with people suffering from various neurological or neuropsychiatric diseases continued to inform the observant minds in developing a better understanding of the relationship between mind and brain. At the borderline between science and literature, the work of Oliver Sacks, starting with his famous “The man who mistook his wife for a hat” (1985), has been inspirational for many budding neuroscientists and psychiatrists. Less well known is the current work that takes place with the people who suffered the sectioning of corpus callosum, in effect the total physical separation of the two hemispheres of the brain, a procedure that had been seen, from the late 1940s, as a treatment for severe disabling epilepsy, and that became quite well established and accepted in the 1960s. Detailed one-to-one interactions with such split-brain individuals showed that within the expected universal separation of functions between hemispheres, there are marked individual differences in functional restructuring. And, even more interesting and bewildering, but fully reassuring in a simple human way, is the observation that such individuals always perceive the world as a whole, despite the separation between the two sides of their cortex [2].

Most of such studies take place, as they should, in controlled conditions and start by testing well formulated working hypotheses. But it is always fascinating to have the chance encounters, those that bring a fresh or unexpected perspective that perks the scientist’s curiosity and answers and illuminates the other partner’s understanding. Chance encounters is what social interaction is all about, and Brain Awareness Week could be, and should be as good an opportunity for such public engagements as any.

References:

[1] Fleischman, J. (2002). Phineas Gage: A Gruesome but True Story About Brain Science.; "Phineas Gage – Unravelling the myth" *The Psychologist* (British Psychological Society), 21(9):828–831 (2008).

[2] David Wolman “A tale of two halves” – *Nature* 483: 260-263 (2012).