EXHIBITION: NEUROSCIENCE

A Natural History of the Brain

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The American Museum of Natural History's *Brain: The Inside Story* does not open with the customary brain numerology—the billions of neurons and synapses, the eons of evolution spent packing it all into 1.4 kg of tissue. Instead, you feel your way down a winding corridor surrounded by 680 kg of tangled electrical wire and optical fiber. Spanish artist Daniel Canogar's installation is lit up with rapid trickles of light and sheets of shifting color—a cross between forest and funhouse. There is no better way to see the organ as many a brain scientist does: a staggeringly complex, interconnected tangle in which countless subtle signals whizz by at breakneck speed.

Once the challenge of understanding the brain is made viscerally clear, the exhibition begins. Five main sections cover topics from the nervous system's cellular workings and its role in sensation to how our brains learn and change over time. The immensely ambitious exhibition, based on a knowledge set that is still patchy, aims to explain the human brain to an audience of all ages.

If you are new to gray matter, trying to understand everything from synapses to synesthesia in two hours can feel demoralizing, like cramming from an encyclopedia for a multiple-choice test. But at its best, the show moves away from text-heavy placards to displays that encourage you to understand the brain intuitively. Some of this science exhibition's most effective teaching tools are works of art. To explain how we perceive, Devorah Sperber's visual puzzle assembles delicately tinted spools of thread into an abstract shape that, once refracted through a glass orb, resolves into a famous portrait. Her installation offers a powerful metaphorical account of how a nervous system takes in disjointed bits of information and synthesizes them into a clear, seamless percept—and does so in a manner that feels effortless to the perceiver. Just across the way, a 1.8-m-tall homunculus with monstrously large lips, hands, and feet symbolizes the relative size of the somatosensory cortex's representation of various body parts. (Parents, do not fear: one oversized hand is strategically placed.)

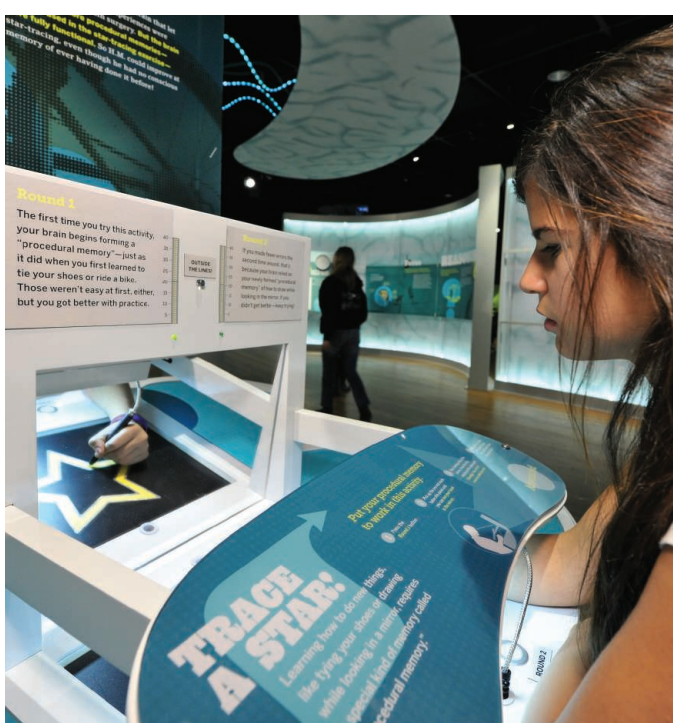
The curators often employed art effectively, so it is particularly unfortunate that they didn't better use visual cues to help unite the vast amount of information. Moving from section to section, one finds the same brain regions in panel illustrations colored differently, which forces visitors to keep track of confusing new neuro-jargon to connect concepts across the exhibition. Early on, an excellent video linking a Juilliard dance student practicing her routine to her brain's activity (illuminated in a clear model) gives a very immediate and useful overview of the brain's geography. But instead of being referenced throughout to anchor the exhibition, it stands alone, the point it so vividly conveys forgotten. More generally, we felt that the show often devotes too much time to naming brain regions without explaining why the information is important. Simply knowing where the cerebellum is, for instance, doesn't help you understand what it does.

Brain
The Inside Story
Rob DeSalle, Joy Hirsch, and Margaret Zellner, curators
American Museum of Natural History, New York, through 14 August 2011. Guangdong Science Center, Guangzhou, China, 19 November 2011 to 30 April 2012. Parque de las Ciencias, Granada, Spain, 14 July 2012 to 6 January 2013. Codie Idee per la Cultura, Torino, Italy, 2 March 2013 to 18 August 2013. www.amnh.org/exhibitions/brain/

But in a few brilliant moments, the show really succeeds in explaining why brain localization matters. At a hands-on table, you are invited to trace a star shape with a stylus while looking at your hand in a mirror. It's a clumsy, frustrating task … at least at first. Above the station, a panel lucidly teases apart why practice makes perfect: As the procedural memory of the task becomes ingrained over time, different brain areas gradually take over its execution. The more frontal ("planning/thinking") regions initially recruited to solve the problem are replaced by areas that specialize in coordinated motion, which explains why, with repetition, the task requires less and less mental effort. It has become mindless.

Some of the show's most dazzling moments occur at the end, in a section that explores advances we might look forward to thanks to this brave new science. In one video, we encounter a scientist who has developed a system for a disabled man that, by capturing his neural activity, allows him to control the motion of a virtual hand (and perhaps one day an actual prosthetic one). Another uses functional magnetic resonance imaging to link musical and athletic aptitude to brain activation patterns, exploring the notion that we, our talents, our tastes, our very selves, are nothing but the product of our nervous systems.

Despite our reservations about the exhibition's lack of unity and unnecessary difficulty in parts, we found that *Brain: The Inside Story* presents a compelling snapshot of brain science and does so without overselling researchers' claims. Some of the exhibition's most moving and successful displays are also its most simple. In a section on aging, two plasticized human brains are placed side by side—one plump and healthy and one whose cortical folds have been thinned by Alzheimer's—requiring no explanation and serving as a silent reminder of how far we have yet to go.



Tricky tracing task.

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