A Museum of Virtual Media

The brain doesn't much care whether an experience is real.

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The term "Virtual Reality" typically conjures up futuristic images of digital computer grids and intricate hardware. But virtual reality begins in the mind and requires no equipment whatsoever. Have you ever spoken face-to-face with someone whose mind wandered off in mid-conversation? Have you ever been startled out of your own reverie by someone waving her hand in front of your face and asking, "Are you in there?" Anyone who's sat through a boring meeting has experienced being somewhere else. And everyone's mind travels when they dream. Humans have toyed with and discovered numerous ways to facilitate such mind travel for tens of thousands of years. Far from being an odd hobby of geeks, virtual reality has been a large part of the human experience from our species' earliest days.

SnowWorld is a three-dimensional, virtual-reality environment that can be viewed through goggles and manipulated by means of a "cyberhand" or other tools. Developed at the University of Washington Human Interface Technology Laboratory in collaboration with Seattle's Harborview Burn Center, it gives burn victims a vivid experience to "enter" and focus on during wound care, drawing their attention away from the pain of treatment procedures.

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If a hands-on Museum of the History of Virtual Reality Technology existed, visitors would find in it many milestones in communication technology. This is not to say there

are no other important functions of communication—such as sharing information—but people have also used media to transport the mind away from grounded reality. Media tend to be safer than narcotics.

Imagine entering such a museum, perhaps first opening your bag for inspection by a security guard before proceeding to pay for admission. You pick up a floor plan and see the rooms are arranged in roughly chronological order from the distant past to the present. In each exhibit, you will encounter the tools people have created to facilitate mind wandering.

STORYTELLING In the first part of a two-room exhibit, there's an obvious spot on the floor marked "visitor," inviting you to sit. You find yourself in a group of what appear to be Stone Age men and women. One of them stands up and begins to relate a story about where the animals surrounding their camp originated, how an all-powerful spirit put them there. The other cave people seem to be listening. They're just animatronic robots, speaking in English, but you get caught up in the story and become one of the tribe.

In the second room, distinctively modern in décor, you join several other visitors sitting on couches arranged around a working fireplace. In a broadcast of his weekly radio show, *A Prairie Home Companion*, Garrison Keillor is mesmerizing everyone with his descriptions of the people and happenings in his fictional Minnesota town, "where all the women are strong, all the men are good-looking, and all the children are above average." You're getting to know the good citizens of Lake Wobegon. As you close your eyes, you can almost smell the stale beer at the Sidetrack Tap.

GRAPHICS For ancestral humans, words were not enough—so graphics were invented. The next exhibit room is a replica of part of a cave in France, where some wall paintings date back at least 30,000 years. The colorful drawings are mostly of large animals in motion. You sit on the cave floor as a video shows three archaeologists debating the meanings and functions of this primitive art. One argues that the paintings were made by ancient shamans, who went into caves, entered into trance states —perhaps with the aid of drugs—and painted their mental visions, including images of "spirit animal" guides, to share with those who would view them later. The second archaeologist argues that the paintings revealed the fantasies of adolescent males, members of the age group that may have dominated the population way back then. He

points out as proof that their "graffiti" evoked powerful animals, hunting scenes, and even sexualized depictions of women, themes akin to those of many action movies today. The third argues that the paintings were created by early humans to increase the prospects of hunting success, by magic or by the education of young hunters.

Suddenly the cave darkens, and a fur-wrapped cave dweller enters with a large burning torch, which he plants in the soft floor of the cave. The fire casts his shadow on the cave ceiling. He entertains everyone with a series of hand and finger motions, creating a panoply of moving shadow animals. This is likely the first animation technology.

SCULPTURE The date and place labels in the next gallery show that sculpture emerged in many parts of the Old World at roughly the same time as cave painting. One of the oldest known statues, a lion-headed human figurine, was found in a cave near Ulm, Germany. Scientists believe it was created about 32,000 years ago! A descriptive plaque explains that such sculptures may have been regarded as physical manifestations of the gods—or even as gods themselves. Primitive people, you conclude, may have had a misplaced sense of reality. Then, reflecting on various persisting spiritual teachings, you realize that some religions regard our physical world itself as a temporary illusion, which falls away after death to reveal a more real world.

THEATER A large exhibit re-creates the effect of an open-air theater in ancient Greece. A play is unfolding on the stage far below. The performance is complex, recorded in scripts that are passed on to later generations. Ancient playwrights produced stories that, through actors, stimulated an audience's imagination. Unfolding over time, the performances were complete with two- and three-dimensional graphics —masks, scenery, and props. (In many cultures, puppets perform the action, without breaking the spell.)

You recall once really getting into character, perhaps virtually becoming Puck in your high school's production of *A Midsummer Night's Dream*. Theater is transporting for both the actors and the audience.

MANUSCRIPTS In this gallery, you first learn about the development of tools for writing: the reeds, clay tablets, and papyrus of ancient Sumerian and Egyptian scribes; the invention of ink, said to have occurred as early as 2700 BC, and modern paper, in

the first or second century AD—both in China. The quill pen appeared around AD 700 in Europe. Scrolls and scripts facilitated the transmission of knowledge. A diorama depicts European monks busy at work on an important aspect of their calling, preserving religious tracts for the future by hand-copying and decorating them. The archives produced in this medium allowed those who read them to travel back to times of revelations and miracles.

PRINTING AND MOVABLE TYPE The prominent exhibit sign shows this one is a "must-see." In China, printing using hand-carved blocks of wood was adapted in the seventh century to printing texts and designs on paper. In the mid-eleventh century, the Chinese also experimented with movable type made of clay, but its use was constrained by the thousands of unique Chinese symbols. In the West, though, movable type was perhaps the most important innovation in communication media technology since writing. The mid-fifteenth-century invention of individual alphabetic characters is credited to the German goldsmith Johannes Gutenberg. It made the modern printing press possible. In the tradition of Western European monks, the first major work that Gutenberg printed was, appropriately enough, the Bible. You marvel at a rare original copy though a sealed glass case.

Also on display is a complete set of J. K. Rowling's *Harry Potter* books, which have been translated into more than sixty-five different languages and sold more than 450 million copies. If you think of it as one long book, this series is likely the next most printed and owned (after the Bible and the Koran) of all time! Maybe you recall watching the first *Harry Potter* movie with your daughter, who exclaimed of the fictional Hogwarts Academy, "It looks just like it's supposed to look, it's really real!"

PHOTOGRAPHY In the anteroom to this hall of the museum, the docent sheds light on the obvious—that photography was an important milestone. Many of the medium's technological forerunners are displayed up close, including early pinhole cameras and the camera obscura. You learn how chemicals interact with light to form photographs. Then you see a copy of French inventor Joseph Niépce's first photograph, developed and printed in 1826. Is it a man at a drafting table or a scene of a French village? Even when media try to capture grounded reality, there is room for interpretation.

As photography advanced through the efforts of LouisJacques-Mandé Daguerre and

William Henry Fox Talbot, popular reactions, according to photography historian Mary Warner Marien, "ranged from the exuberant to the cautious." You see the first color photograph, "Tartan Ribbon," taken by renowned physicist James Clerk Maxwell in 1861. It reminds you that it's time to scan all of those family snapshots and save them electronically for posterity.

CINEMATOGRAPHY The history of media technology leading up to photography was paralleled by an equally long history of attempts to represent the movements of animals, people, and objects. Even cave paintings often were "stills" of animals in motion. The first stop of this exhibit is a pad of paper with a drawing on the top page. Following the instructions, you riffle the stack from the lower left corner. Stick figures that were previously standing still dance as the pages fly by. Movies are conceptually similar to flipping through such pads of paper.

Modern movies began appearing in the late nineteenth century, and the first screening of a movie for a paying audience is often credited to Auguste and Louis Lumière, French brothers who in 1895 premiered the first short films. You watch one of their earliest films, titled *The Arrival of a Train at La Ciotat Station*. The forty-five-second reel plays, and you see that the camera shooting the film was placed very near the railroad tracks and captured a train's motion as it approached. Do you flinch just a little as the train bears down? As cinema legend has it, the sensation this film gave the audience of an oncoming train rushing toward them proved unbearably scary for many, and some were said to have fled the building in which the movie was screened. The realism and perspective induced what we call involuntary virtual travel: part of the viewers' minds reacted as if the train was real. They could not control their automatic, unconsciously driven fear responses.

ELECTRICITY It isn't exactly an example of communications media—but once harnessed, electricity became the driving force behind most of them. You stop by this room to learn how the discovery, production, and transmission of electricity revolutionized motion pictures, recorded music, and communication. Unlike earlier media technologies, electrified media made it possible to communicate in near real time over long distances and to multitudes of people simultaneously.

A clicking sound calls attention to Samuel Morse's telegraph and its coded two-way

communication. The first transcontinental lines were completed in America in 1861, so transmissions traveled East to West and back again in an instant. Only nineteen months after it began, the renowned Pony Express was wiped out by electricity and the telegraph. A half century later, telephone lines incorporating amplifiers linked Alexander Graham Bell's voice telephone coast to coast. But today, despite huge advances in all sorts of media technology, the "telegraph model" is still quite a successful one, as can be witnessed by the rampant use of text messaging among young people. Tap on a key and try texting 1860s-style.

BROADCAST MEDIA With the invention of the first practical vacuum tube (credited to English physicist John Ambrose Fleming in 1904), electricity begat electronics. Although vacuum tubes provided the amplification technology for long-distance phone lines, they also made short-wave and commercial radio possible. People could now broadcast sounds—and whole worlds made of sound, as in radio drama—simultaneously to very large audiences. (An audio clip plays from Orson Welles's terrifyingly believable *War of the Worlds*.) Later, the invention of television made possible the multimedia combination of audio and video transmission. You don a special pair of glasses and watch the last six minutes of the most recent NFL Super Bowl on 3-D television. It's like being on the field.

THE COMPUTER AND THE INTERNET Vacuum tubes were used to construct the first digital computer between 1939 and 1942. In 1946, the first general-purpose electronic digital computer, the ENIAC ("electronic numerical integrator and calculator"), was constructed at the University of Pennsylvania. The invention of the transistor revolutionized electronics, replacing inefficient vacuum tube–based computers with solid state–based digital computers. Ultimately, in the early 1970s, microcomputers (the forerunners of personal computers) appeared on the scene.

Software advances accompanied the miniaturization and increasing speed of computer hardware. Word processing became commercially available in the late 1970s and early 1980s, making computer users out of millions and millions of people around the world. Almost immediately, in-house local networks made the first e-mail capabilities practical, and such systems became the envy of corporations that lacked them. Soon demand drove the establishment of a network of networks, leading to then-senator Al Gore's "information superhighway" bill that helped establish the Internet.

Depending on your age, you may remember struggling to adapt when computers were first introduced into your office and home. If you are young enough, you can't imagine a world without videogames, Wikipedia, and Skype. You ponder this as you are ushered out of the museum. It is nearly closing time. Incidentally, this has been a virtual tour.

Our species is now at or slightly past the threshold of creating technologies that, for good or bad, will transform the experience of being human. Consider the telephone. When asked who's "on" the phone with you, you don't say, "Joe's digitized voice." You say, "It's Joe!" Indeed, most people are totally unconscious of the simple fact that the voice they hear during a cell-phone conversation is not the other person's actual voice but a digital reconstruction that only approximates that voice and is registered and produced nearly in real time. The fidelity of that voice is simply good enough so that our conscious powers remain quiet, never injecting doubt into our minds about the reality of the person with whom we're interacting.

Technology will soon provide levels of visual fidelity—and, later, touch and smell—comparable to the audio fidelity of the telephone. In other words, virtual worlds encompassing all of the senses (think, more or less, *The Matrix*) will at some point feel as "real" as a telephone conversation does today (think *Avatar*). Those worlds may be disorienting at first, but we can and will adapt in short order. Now that the technology has begun to catch up to the sci-fi musings of the past, we can begin to see how humankind will soon ground more and more of its reality in virtual worlds.

In a visit to our museum 300 years down the road, an exhibit of virtual-reality technology will highlight this turning point in our history. Of course, by then all "real" museums may have been replaced by virtual ones, and no one will remember actually visiting one.

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