

Afraid of Shadows

Spooky illusions trick and treat your brain

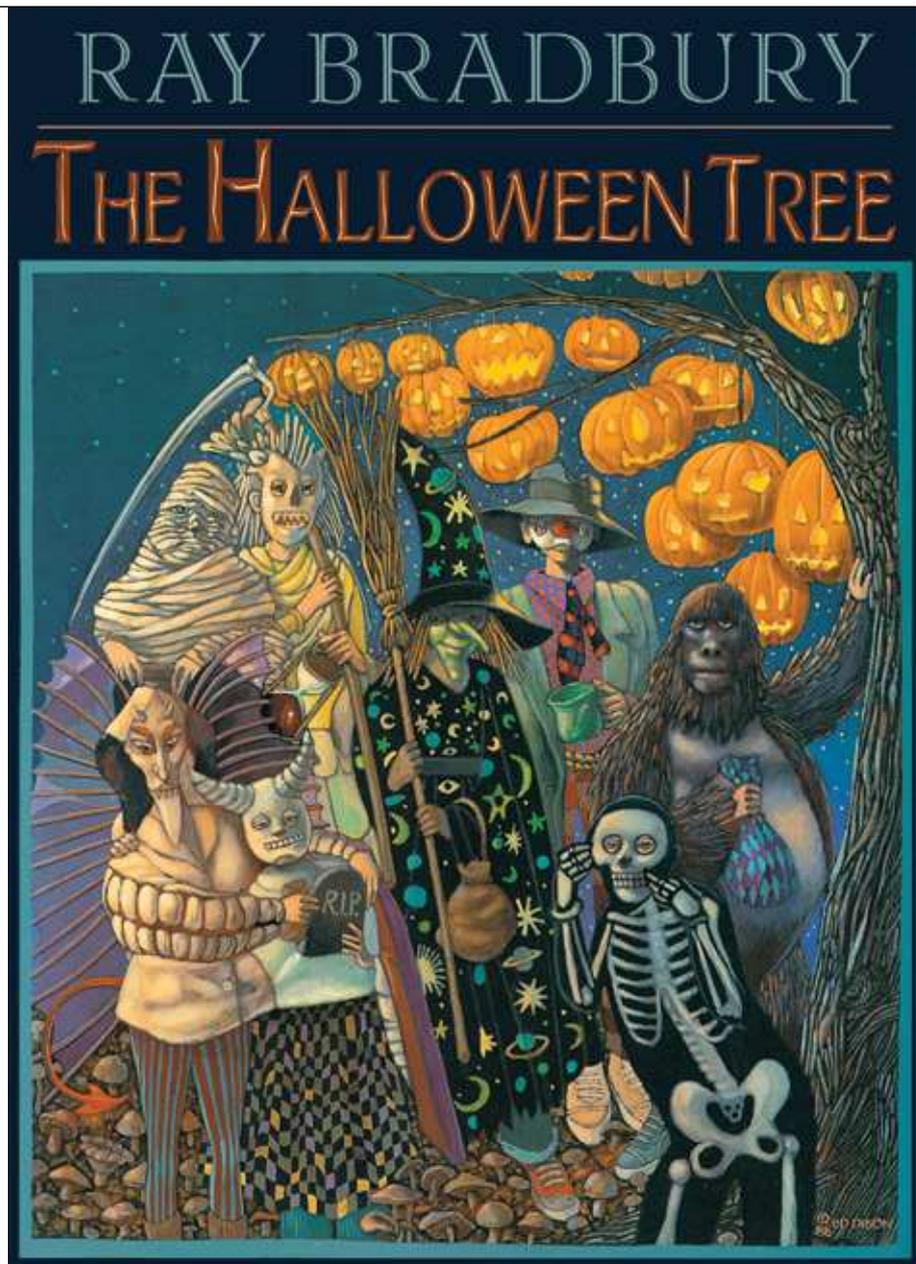
BY STEPHEN L. MACKNIK AND SUSANA MARTINEZ-CONDE

“What difference do it make if the thing you scared of is real or not?”

—Toni Morrison
Song of Solomon

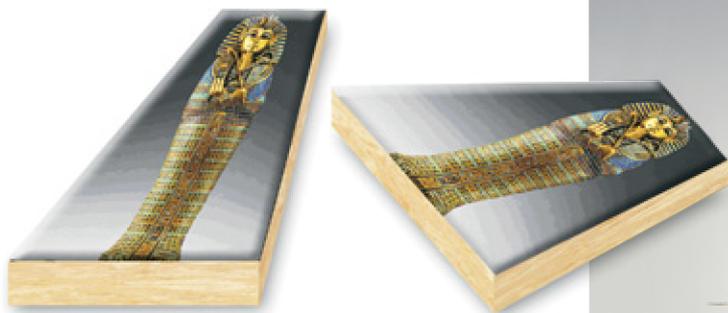
HALLOWEEN celebrates illusion. Even if we manage to ignore flights of fancy the other 364 days of the year, come October 31 we set out to enjoy trickery and pretense. We disguise ourselves, we carve malevolent expressions in bland, innocuous pumpkins and we do our best to suspend our disbelief as we enter supposedly haunted houses. We become illusion creators as well as willing victims. We seek fake fear. But costumes for our masquerades are not the only deceptions that Halloween brings you. Any emotion you experience, whether it be fright or delight, is real only in your mind. In a neural sense, all of us are afraid of “ghosts”; we all have irrational fears that are disconnected from fact (bugs and small spaces are some of our own personal phobias). With its harmless thrills and scares, Halloween pushes gently on the limits of the reality that our brain constructs. And one thing about limits, as Michael Jordan said in his Hall of Fame induction speech in 2009, is that “like fears, [they] are often just an illusion.” **M**

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TRICK-OR-TREATERS

In *The Halloween Tree*, a 1972 novel by American horror, science-fiction and fantasy writer Ray Bradbury, eight children go trick-or-treating. Can you find them in the book's cover? In this ambiguous illusion, the costumed kids, their props and the tree in the background form the shape of a skull. Step back from the scene or squint your eyes if you have trouble seeing the skull. To identify the trick-or-treaters, get close again, paying attention to the details in the image. When your perception of an ambiguous image flips back and forth between two possible interpretations, so does the underlying neural activity in the areas of your brain that are responsible for your experience.



THE CURSE OF THE MUMMY

“Wretchedness and death will befall to those who disturb the rest of the Kings!” Before you dismiss the Curse of the Twin Pharaohs as nonsense, take a careful look at the two sarcophagi and see if you can detect any signs of evil sorcery. The left sarcophagus appears longer and narrower than the one on the right, and the left mummy image is taller and skinnier than that of the other mummy. Or is this the case? Grab a pair of scissors and cut around the trapezoid shapes on top of each sarcophagus. Now rotate them and superimpose them. Both mummies and sarcophagi are exactly the same size. The effect is a variant of the classic Shepard tabletop illusion, in which two identical parallelograms with orthogonal orientations to each other appear dissimilar in shape. Images drawn inside the parallelograms, such as the mummies in the sarcophagi, are assimilated into the Shepard illusion, so that they, too, appear distorted.



WHAT LURKS IN THE SHADOWS

Gestalt psychologists famously asserted that the whole is different from the sum of its parts. British artists Tim Noble and Sue Webster's *Dark Stuff* agglutinates the bodies of 189 mummified animals, including 67 field mice, five adult rats, 42 juvenile rats, 44 garden shrews, a fox, a squirrel, a weasel, 13 carrion crows, seven jackdaws, a blackbird, a sparrow, a robin, a toad, a gecko and three garden snail shells. As anybody would agree, the outcome is so much more than the sum of its body parts.



SINKING FEELING

Acrophobia, or fear of heights, occurs even if the height is fake. According to neuroscientists Maria V. Sanchez-Vives of the August Pi I Sunyer Biomedical Research Institute in Barcelona and Mel Slater of University College London and the University of Barcelona, a virtual-reality pit (near left) and a real pit can generate



comparable psychological and physiological reactions (such as changes in heart and respiratory rate). Psychologists have started to take advantage of this idea to provide safe, but highly effective, phobia-desensitization therapies consisting of exposing patients to photorealistic virtual-reality scenarios. Artists, such as Andrew Walker, just want to scare the shizzle out of us. Walker painted an elevator floor at the Southside Shopping Center in Wandsworth, London, to suggest a multifloor vertical drop (far left). The illusion advertised a thrill ride at the Alton Towers Resort theme park. See the alarmed Londoners' reactions at www.visualnews.com/2012/02/16/3d-elevator-illusion-shocks-london-shoppers.

TOP: COURTESY OF DANIEL PICON (left); COURTESY OF TIM NOBLE AND SUE WEBSTER AND BLAIN SOUTHERN (right)
BOTTOM: COURTESY OF ALTON TOWERS RESORT (left); COURTESY OF DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL (right)



OUTRAGEOUS PUMPKINS
American sculptor Ray Villafane competed as one of four professional pumpkin carvers and bagged the Grand Prize in the Food Networks' Challenge Show, *Outrageous Pumpkins* in 2008, and *Outrageous Pumpkins Challenge II* in 2010. He has since carved pumpkins around the world, including in the president's White House quarters. For Halloween 2011 he established a new world record for carving the heaviest pumpkin ever documented. The beast, grown by Jim Bryson and his daughter Kelsey, weighed in at 1,818.5 pounds. Villafane sculpted zombies from a smaller pumpkin (weighing a mere 1,693 pounds) and staged them to create the illusion of the living dead bursting out of the colossal squash pod (far left). See the artist in action at www.visualnews.com/2011/10/29/halloween-worlds-largest-pumpkin-carving.

ALL IS VANITY

All Is Vanity, an 1892 drawing by American illustrator C. Allan Gilbert, draws on the 16th- and 17th-century European Vanitas painting tradition, in which still-life objects symbolize the transient and meaningless nature of earthly pursuits. The woman admiring herself in the mirror does not realize that her bottles of perfume, her makeup table (also called a vanity), her elegant gown, even her own youth and beauty, are fleeting illusions. Only death, represented by the skull engulfing the scene, is permanent and real. *Last Days of the Sun*, by British sculptor James Hopkins, puts a contemporary spin on the Vanitas concept. The seemingly casual arrangement of rock-star bling signifies the futility of ephemeral fame and riches. The skull emerging from the image provides the set of items with symbolic meaning.



(Further Reading)

- ◆ *Mind Sights: Original Visual Illusions, Ambiguities, and Other Anomalies, with a Commentary on the Play of Mind in Perception and Art.* R. N. Shepard. W. H. Freeman, 1990.
- ◆ *From Presence to Consciousness through Virtual Reality.* M. V. Sanchez-Vives and M. Slater in *Nature Reviews Neuroscience*, Vol. 6, No. 4, pages 332–339; April 2005.
- ◆ *Ray Villafane's Pumpkins.* R. Villafane. Gibbs Smith, 2012.

TOP: COURTESY OF VILLAFANE STUDIOS; BOTTOM: C. ALLAN GILBERT, 1892 (left); COURTESY OF JAMES HOPKINS (right)