

In Touch With Reality

Mark Lythgoe explains why touch can help us to see more clearly

“Touch functions on many levels of adaptation, first to make survival possible and then to make life meaningful.” – T B Brazelton, 1990

In 1972 John Berger pointed out in his wonderful book *Ways of Seeing* that “seeing comes before words”. That’s sight before language. But in terms of your development, touch comes before both. In fact, it may well be through the haptic sense that you learn to know and find your place in the world. Before you are born you are exploring yourself and what’s around you. As early as eight weeks gestation you respond to a gentle touch on the cheek. By twelve weeks you begin sucking your thumb and even make licking movements as you start to discover your environment. At 32 weeks you are able to decode a rich array of sensory information from the world in the form of temperature, pressure and pain, and touch is the medium for this knowledge. You are perceiving the world through touching it, or being touched by it.

In February this year I met Richard Gregory, emeritus professor of neuropsychology at the University of Bristol, and he described to me the remarkable case of a man who was blind from birth and regained his sight after a corneal graft. Following the operation he could, to Gregory’s surprise, walk down hospital corridors without holding on to walls. Soon after leaving hospital he asked the professor to take him to the Science Museum to see an exhibit of a simple lathe. With the lathe in the glass case he was unable to say anything about the object. But when the case was removed and he was allowed to run his hand over the machine, he understood everything about it. “Now that I’ve felt it

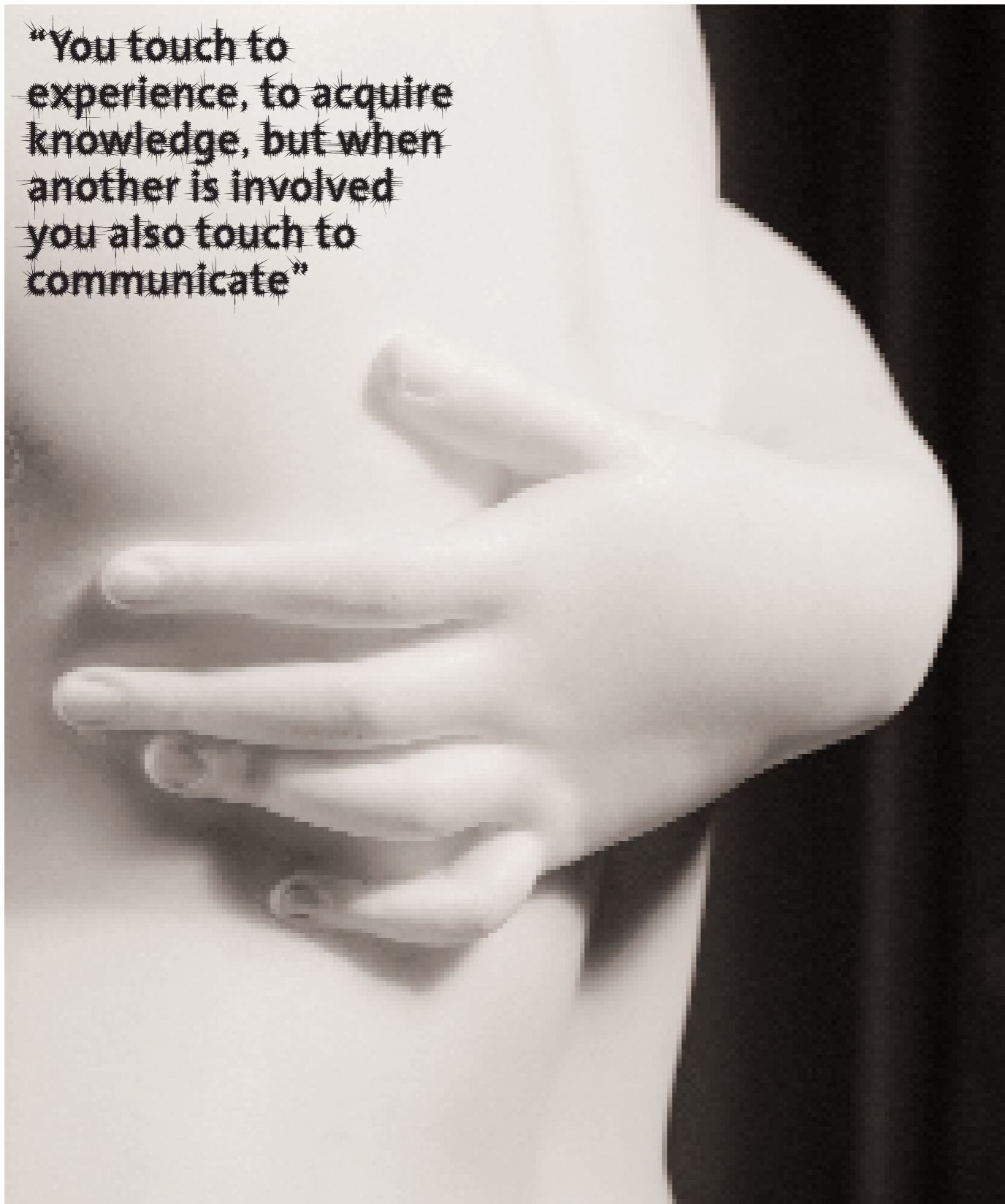
I can see,” he said. Bizarrely, he was effectively “blind” to objects he hadn’t touched: he had to make the connection between the feel and image of the lathe before he could see it. It is impossible for those of us with normal vision to imagine this predicament – to be blind to an object you can see in front of you – yet it suggests that in some way we can see with touch, even that we need touch to see. In other words, there is far more cross-talk between our senses than we might imagine.

I recently interviewed James Wannerton, a synaesthete who has a neuronal cross-wiring between two of his senses. The interview was part of a TV programme investigating the nature of Einstein’s genius and its relationship to increased connectivity in the brain.



Fiona Shaw in T S Eliot’s *The Waste Land*, Wilton’s Music Hall, London, 1997. Photo © Theatre Museum, Graham Brandon

“You touch to experience, to acquire knowledge, but when another is involved you also touch to communicate”



Antonio Canova, *The Three Graces* (detail), 1814-1817. © V&A Images

Each time James heard a word he would get a sharp, involuntary taste in his mouth, because of a mixing of his taste and hearing senses. He literally tasted the words Albert Einstein as I said them to him. “Yogurt and wafers, Albert Einstein tastes of yogurt and wafers,” he announced. This unusual cross-wiring between brain areas can cause the most peculiar sensations. Imagine mixing touch with vision, which is, of course, impossible, yet strangely not as far fetched as you might think. Professor Vilayanur Ramachandran describes the extraordinary case of a blind patient who began to notice that whenever he touched objects or read Braille his mind would conjure up vivid images or flashes of light, and another who experienced a bitter taste in his mouth when shaping hamburger patties with his hands.

It would appear that touch is not always touch; that in fact the organisation of our brain dictates how we experience our sensations. The brain has different regions that control different functions and, as you might expect, it was thought that the visual part was just for seeing. But this would seem not to be the case. If you are blind from early in life, you become good at detecting small distances between two points (as in Braille). Apparently, this “vision” is, in part, due to touch taking over, or reorganising, the visual part of the brain so that you have better touch sensitivity.

The tactile sense develops prior to others and is not as confined to discrete boundaries. But could it underpin our ability to communicate? Imagine that you are wearing a blindfold and holding two shapes, one like a piece of shattered glass with many jagged edges, the other a softly rounded blob. I’m going to give you two nonsense words, “booba” and “kiki”, and I want you to associate each with a shape. My guess is that you would partner “booba” with the rounded shape and “kiki” with the jagged one. If you did, you’d be one of the 98 per cent who would do the same. Along the same lines, we might also say that the taste of lemon is sharp; here we are associating shape and taste. Could this simple representation of the characteristics of shapes that we’ve touched (or seen) as sounds or words be the building block for language as a form of communication?

Sensations provide your conscious and subconscious with an awareness of the internal and external conditions of your body. The skin feeds you information on temperature and, if you are in danger of damaging your delicate tissue, pain or pressure. Yet you also have a kind of internal “touch”. Nineteenth-century neuroanatomist Sir Charles Bell called this the sixth sense, proprioception – your unconscious interpretation of the sensory feedback derived from muscle, tendons and joints that enables you to keep track of your body in space. You can test this sense by

placing your right hand out of sight above your head. Keeping it still, use your left index finger to touch your right thumb. It is not always easy to make an immediate connection with your thumb. If you did contact it directly, then you’ll be glad to hear it’s thanks to proprioception. This leads me to the strange case of “the disembodied woman” Christina, a patient of neurologist Oliver Sacks who had lost her proprioception. She had great difficulty walking and standing as she would “lose” her body in space. This may be similar to the feeling you get if your leg “goes to sleep”. However, as Christina’s sense of touch was unaffected, she could find her body image via touch by riding in a convertible car and letting the wind brush against her skin.

Yet touch is much more than just a mechanism by which we sense the world around us. It is a two-way process that provides a complex exchange between people: it establishes a relationship or connection and creates an instant dialogue. To start a haptic communication you literally need to be within “arm’s reach”, which is more than just an idiomatic expression, but defines a special spatial relationship. You touch to experience, to acquire knowledge, but when another is involved you also touch to communicate. Without thinking you automatically transfer information. We even use the phrase “keep in touch” as a metaphor for speaking in the near future.

Touch as communication can illicit a number of chemical and physical changes in the brain and body, and a lack of physical contact in the early years can lead to abnormal development in brain areas that deal with emotion. Young children or babies placed in environments of extreme deprivation of touch may suffer delayed development of mental and motor skills. In the saddest cases, a child could literally perish through lack of contact.

Overall, it is this relationship between touching and knowing that is possibly one of the cornerstones for our human experience and communication. Touch is many things and can be described by science in wondrous and infinite detail, yet it is the likes of the deafblind Helen Keller who bring us to a core understanding of our relationship with touch: “My hand is to me what your hearing and sight together are to you... it is the hand that binds me to the world of men and women.”

Mark Lythgoe is a neurophysiologist at the Institute of Child Health (UCL), where he uses magnetic resonance imaging (MRI) techniques to investigate brain function. He wishes to thank Robyn Haselfoot, Andrew Mitchell and Sally Dowsett for their comments and suggestions regarding this article. He is taking part in ‘Making Contact: the art and science of touch’, a discussion with Jeanette Winterson, V&A, London SW7 (020 7942 2000, www.vam.ac.uk), 17 August