

**BELL:**  
**TOUCH / TACTO**



# TOUCH

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It is hard to imagine a gesture that expresses more closeness than the caress, a caring touch that encounters just the right zone and applies tactful pressure and gentle motion. The mother's caress of a newborn is the primordial act of socialization, transitioning the neonate into a world where interaction with other animate beings is the individual's destiny. One can suppose that the unborn being has already experimented with reaching and touching even before coming fully into the world, but birth immediately foregrounds the touch of the other's skin. We know that the absence of the caress in early developmental stages leaves a trauma never quite assuaged. And later, sexual coupling would be brutish and brief were it not for the only apparently superfluous supplement of a certain pattern of touch. Finding a sexual partner is easily imagined as a return toward the original mother's caress, because that first caress is the model for biological and social interaction. To be close is to touch fellow beings, and there are few identifiable limits to experiments with touching at the earliest age, other than the limits of movement, which the infant slowly expands. The deeply formative neonate and infant experiences with coordination between the hand and the mouth, touching and grasping with the hands and then bringing an object to the mouth for further exploration, demonstrate the inti-

mate link between touching and ingesting, and ultimately between touching and speaking. To touch, to bring closer, to ingest in order to make something a part of the «I,» and then to mouth sounds with the same tongue and lips that touch and taste: these are primordial mechanisms of exploring the body's relation with the other and the world.

In a contemporary adult world, at the other end of a developmental spectrum, is the unbearable jostling in the crowded streets and transportation systems of modern urban conglomeration. Poked and pushed from all sides, the rider on a subway or bus at rush hour experiences the closeness of the other as an intrusion into a body space all the more limited by the confinement peculiar to such places. No more delight in ingesting the other here, in exploring connections through a pat or a hug, but quite the opposite: a desperate attempt to repudiate closeness and establish separation. The mental concentration necessary to maintain the spatial rift between the other and one's own embodied presence is written into the blank expression on the subway rider's face. We may believe, without reflection, that the emptiness of the stare denotes the vacuum of the mind, but in truth, the subway rider is deeply absorbed by the effort to deflect and suppress the reactions that uninvited touch would normally elicit. Such urban

experiences can easily be documented back to the eighteenth and nineteenth centuries, as the great European metropolises were constituted. The nineteenth-century French popular writer Paul de Kock's brief description of Parisians walking on newly-constructed sidewalks (a very novel urban architectural feature in Paris in the 1820s) is a humorous reminder of what it means to be in a crowd vying for the same urban space while anxiously dodging contact, that is, the touch of the other. More enervating and darker is Poe's description of the observer trailing a mysterious and anonymous stranger through the streets of London at nightfall: «It was now fully night-fall, and a thick humid fog hung over the city, soon ending in a settled and heavy rain. This change of weather had an odd effect upon the crowd, the whole of which was at once put into new commotion, and overshadowed by a world of umbrellas. The waver, the jostle, and the hum increased in a tenfold degree» (Edgar Allan Poe, *Tales*, London: Wiley & Putnam, 1846, 224.) Crashing into others—poking, pushing, or prodding to maintain our balance and trajectory—we carom through streets in throngs we cannot escape.

Touch is such an essential sense for the experience of closeness in an increasingly crowded contemporary world that it would appear to be an indispensable element to build into the new twenty-first century network of instantaneous digital communication. We are «in touch» with each other as if, we like to imagine, we were actually in the presence of one another and able to reach out physically to each other. The Unix operating system contains a command line instruction «finger»—«finger username@node.domain»—which returns information, sometimes personal, on the username sent with the command line, but the verb suggestively refers as well to the most intimate caress imaginable. The word «digital» itself, although referring principally to methods of counting fingers at the origin of number systems, gestures toward one

of the principal sites on the body containing the most delicate touch-sensing anatomical structures. Think, for example, of the haptic feedback required as we type a message on a keyboard. Nothing irritates an expert typist more than spongy or stunted key travel that does not provide confirmation of the requisite pressure applied to imprint the digital letter.

The language both of computer programming and of our ways of describing the broader organization of our correspondence with parties physically removed from us intersects tellingly with the semantics of touch. We maintain «contact» lists; we «reach out» to each other; we «stay in touch» with someone, for example. Significantly, however, developing methods for creating haptic feedback and interaction in the hardware of digital communication lags notoriously behind vision and hearing in interface development circles. (*Haptic* derives from Greek *haptikos* «able to touch or grasp,» from *haptein* «fasten.») The typical clamshell portable computer limits us to a keyboard and the increasingly ubiquitous touchpad, a smooth rectangular surface often made of hardened glass, across which a finger or two may glide to accomplish simple tasks punctuated by more forceful clicks. The caress and the poke emerge once again as preeminent gestures, but so impoverished that they are nearly unrecognizable as such. (The Basic programming language contains a command called «poke,» which inserts a value into a memory register.) The recent introduction of touch screens barely modifies the simple touching gestures already possible with the touchpad. Nor does the now ubiquitous vibration feedback of our cellphones, which signals to a cutaneous region in contact with the phone that something is happening, combining the aural and the haptic in the often-vain attempt to get our attention. The vibrating signals actually often work best if the phone is on a hard, resonant surface, which amplifies the phone's sound enough for us to hear it despite the fact that we have set it

to «silent.» Detecting the vibration against one's skin is hit-and-miss at best, because we are too distracted by other more intrusive perceptual information, which pushes the vibration against a small skin surface into the dim background of our busy preoccupations.

But what of immersive environments, those imagined and increasingly constructed contexts in which the person interacting with the created place would actually be in the midst of and moving within a representation of a scene? The great French film theorist André Bazin once spoke of the «myth of total cinema,» which inspired the dreamers and inventors of the medium, he argued, in a much more sustained way than simple technological innovations: «In their imaginations they saw cinema as a total and complete representation of reality; they saw in a trice the reconstruction of a perfect illusion of the outside world in sound, color, and relief» (André Bazin, *What is Cinema?*, trans./ed. Hugh Gray Berkeley: University of California Press, 2004, 20). Tellingly, the term «relief» refers to the impression of depth and movement both of the objects represented and of the viewer's changing relation to them, but it seems to overlook a crucial element, one that would truly immerse the viewer—the ability to reach out and touch the reliefs, to verify that the things the eye reports are actually there. The immersive experience Bazin imagined, which the great inventors of cinema sought from the beginning in his view, is missing the one element that defines immersive closeness in a primordial way, namely, touch. How immersive can an experience actually be if when I reach out to touch the image moving around me I grasp only empty space? We should not forget that the apostle Thomas, bereaved by the crucifixion, refused to believe that Jesus could have undergone it and then have risen from the dead, and he asked for confirmation in the form of touch: «Except I shall see in his hands the print of the nails, and put my finger into the print of the nails, and thrust my hand

into his side, I will not believe» (John, v. 25). When Jesus later appeared, he invited Thomas to touch his wounds in order to confirm the story. To believe is to touch, that is, to be as close as is possible to the thing whose existence is to be tested.

More generally speaking, the neonate's act of reaching out to touch is the first test of the world's reality and accompanies, if not precedes, organization into visual fields. And once those fields begin to display some regularity, measuring and rationalizing them proceeds by comparing the size of the body (the length of an arm or the length of a step, for example) to the size of the world. Abstracting from a measuring system based on reaching out to touch, and thus transitioning to a schema that is no longer intimately related to the ability to touch the object to be measured, is a conquest of abstract reasoning. The Greek philosopher and mathematician Thales set out to measure the pyramids, leveraging geometric principles in order to transport measurement to a scale that greatly exceeded the size of his own body. But in order to do this, he began with a geometry whose principles could be illustrated on a human scale before being drawn to a greater scale, eventually to estimate the heights of the pyramids of Giza or the distance of the sun from the earth. How can one measure closeness in such a way as to understand the dimensions of distance? Everything begins with touching the environment surrounding the body, with the body's intimate closeness to its environment, with an embodied cognition that incorporates touch as a principal mechanism for exploration.

Why is it so hard to replicate the sensation of touch in digital media, when sight and sound seem increasingly easy to incorporate into interfaces? What is so technologically daunting that experiments with touch often appear to be exceedingly primitive? Not that what one sees or hears while interacting with someone on a screen through a machine connection truly

recreates visual images and sounds as they are perceived and experienced in a space where animate beings are within sight and earshot of one another. The eighteenth century French *philosophe* Jean-Jacques Rousseau already emphasized the danger of distance in communication in the eighteenth century when he spoke of Geneva as an ideal political space in which citizens could interact democratically, because the city was small enough to allow them actually to see and hear one another without mediation. He might have added that they needed to touch, embrace, jostle one another if there were to be a true social body.

A way to begin answering the question about the difficulty of replicating the experience of touch in a digital medium is to remember that touch is a sense unlike any other. When Aristotle systematically described the domain and function of each of the five senses—sight, hearing, smell, taste, and touch—he immediately encountered complexities that distinguish touch from the other senses and make it a poor fit for his categories. In his struggle to establish uniformity in a presentation of the mechanisms of sensing, Aristotle creates a tripartite system: *qualities* of objects in the world traverse a *medium* and are perceived by a *sense*. This works well for sight and sound, where certain qualities are transmitted through a medium (let's simply call it air) and registered in the eye or the ear. Paradoxically, however, the sense of touch requires direct contact with the surface touched, and a question immediately arises: what and where is the transmission medium through which the qualities of things to be touched are conveyed? If the sense organ itself is in direct contact with the object to be sensed, how can there be any separation between the sense and the qualities it senses? The system of mediation collapses. And in the wake of this collapse, one understands the difficulty of introducing haptic feedback into machine interactions at a distance. Haptic feedback requires a stimulus in immediate contact with the very

body of the perceiver. Hence the impoverished reduction of the haptic to vibrations, for example, and the fundamental challenge of translating qualities like smooth/rough, wet/dry, or hot/cold, which are the very stuff of touch.

It is not enough to say that touch does not conform to the Aristotelian tripartite configuration of the perceptual experience and thereby demonstrates the limit of the philosopher's analysis. There is something deeper here. The more Aristotle delves into the problem of touch, the more it becomes apparent that touch might be at the origin of the senses, the seat of *sensation*, more broadly considered, something like the first stratum of sensation from which the other senses arise.<sup>1</sup> Touch would then be the way animate beings become self-aware. If the initial experience of the world for the neonate is the touch of a caregiver's skin, that touch is both an exploration of a world beyond the body and the first sensation of the existence of the body itself. The sense of self, the sensation of existing, cannot be cleaved from the first touch upon exit from the womb. If this is so, there is an obvious problem with *transmission* and *medium* in the case of touch. It is very hard to imagine how to transmit the intimacy, the very closeness of touch, not only as a perception but also as the sensation of being a body. Sight and hearing seem ideally suited for a digitized environment from this perspective, but might it not be precisely because the closeness they seem to vehicle (communication in image and sound joining parties over very long distances) is not one that entirely engages the being of the perceiver?

A concert violinist recently tried to explain to me what it means to perform in public before a live audience, and his comments were quite telling. Everyone imagines, he explained, that I am sculpting sounds with my instrument and emitting them into a medium, air, thus sending them to the ear of the listener. Of course, one cannot deny that there is physics involved in what I am doing and that the vibrations I impart to the

air around my instrument allow a transmission of sound and have a primordial role in the aesthetic experience I am trying to create. But I do not imagine my performance at all in this way. Instead, I think of what I am doing as reaching out to embrace the listeners, touching them with the movements of my bow, pulling them into the movements of my body as I produce music. In turn, they react to my performance, and it is in the give and take of this exchange that inspiration is located.

Much has been written about the differences between live performances and recordings, and the preceding observations most surely capture elements of the complexity of any analysis of the concert setting. At minimum, a concert is a social organization, where the closeness of the spectators, both to themselves and to the musicians, allows sound to envelop them and the space around them in ways that are not possible when simply listening to a high fidelity speaker (as accurate and «warm» as it may be), and this experience necessarily engages more than the ear as organ of perception. Ambient temperature and noise, the comfort of a seat, the «feeling» of being there: all of these elements engage the sense of touch and contribute to the violinist's own awareness that he is producing something that appeals to the touch of the listener.

Could it be that the ongoing debate between proponents of analog recordings and those who defend digital recordings is related to these remarks? Compressed by a lossless algorithm (Apple Lossless Audio Codec [ALAC], or Apple Lossless Encoder [ALE], for example) into a series of commands, the physical traces of a performance, their tangible connection to the performance itself, cannot be fully transported through the algorithm. Analog recordings reproduce sounds through the pits and peaks in a groove on a vinyl disk tracked by a stylus. Might one not say that the stylus is somehow touching a remnant of the original performance, the asperities it left on a vinyl surface, in a way that

digital technologies simply cannot? A tangible (through the stylus) trace of the performance recorded somehow remains, and this very remainder is often described as the warmth of the reproduction. The term «warmth» is invoked to render the sense that one might be in touch with the performers in some way. One of the quintessential qualities measured by the system of touch, namely, temperature (warm or cold), is the only way to express the quality of what would seem at the surface to be simply a listening experience. And the closeness of the concert experience is the touchstone against which all reproductions are measured.

A return to our violinist's observations is important here. How can one analyze the touching to which he appeals to explain his performance? The notion of *gesture* will help us here. In his *Essay on the Origin of Languages*, Jean-Jacques Rousseau makes the following remark:

The general means by which we can act upon the senses of others are limited to two: namely, movement and voice. Movement is immediate through touch or is mediate through gesture; the first, having an arm's length for its limit, cannot be transmitted at a distance, but the other reaches as far as the line of sight.

Jean-Jacques Rousseau, *Essay on the Origin of Languages and Writings Related to Music*, in *The Collected Writings of Rousseau*, ed./trans. John T. Scott (Hanover and London: University Press of New England, 1994), 7:290.

If we are to follow Rousseau's argument, the gesture is a variation on the act of touching and is capable of creating an affect in another being within a field of vision. It represents an extension of the notion of touch, suggesting that we can touch the other beyond the reach of our body. Moreover, what might have been a distance of a few feet when Rousseau was writing in the eighteenth century has now become countless miles, since we can transmit images over vast distances

in the context of our present technologies.<sup>2</sup> As Yves Citton argues, the gesture is a movement whose expressivity is not at all equivalent to language, but rather, it is a supplement, a nuance, a type of movement that is uniquely personal and yet also beyond the conscious control of the individual: it is what defines the singularity of the individual and is recognizable as a style. It is also what creates an affect within the other in social and cultural exchange—beyond any meaning that we may attempt to impart through language. Rousseau extends his reasoning in this direction:

The passions have their gestures, but they also have their accents, and these accents, which make us tremble, these accents, from which we cannot shield our body, penetrate to the bottom of our heart, and in spite of us carry to it the movements that generate them, and make us feel what we hear.

Rousseau, «Essay», 7:292, translation slightly modified.

We always go beyond the attempt to understand what others are saying, we are also touched by the what Rousseau calls their «accents,» the nuance in the gestures that accompany any exchange and penetrate to our hearts, inducing us to feel while we are also trying to understand. Denis Diderot expresses this idea in a related way in his article on the term *Affection* in the great eighteenth century Enlightenment *Encyclopédie*, for which he was a major editor and contributor:

Such are we fashioned that in a certain emotional state, when we feel love or hate, or attraction or aversion, to something, movements of the muscles are produced in our bodies, depending, it would appear, on the intensity or the remission of these feelings. [...] In this way, we resemble musical instruments whose strings are tuned in diverse ways. External objects act like bows on these strings, and we all generate sounds at various pitches.

[My translation]

The body is an instrument that vibrates physically with others, in sympathy with them through reactions that access the muscle system creating movements of rejection or acceptance, hate or love, which go beyond the level of understanding and link individuals in corporeal resonances, the sensations at the very center of every social exchange—what Aristotle called aesthetics.

Think for a moment of a spectator's reaction to a classic horror movie scene. As we anticipate the stealthy arrival of the killer behind one of the unsuspecting protagonists, our hair stands on end. Hair follicles are one of the marvelously complex systems of touch embedded in our skin, composed of different types of nerve endings. One of those nerve endings in the hair follicles is extremely sensitive to air currents, because they put pressure on the individual hairs on our skin. As they bend, the nerve endings sense the pressure of the air currents, which might suggest the presence of other bodies moving nearby, thus creating a perception of a possible threat. The sympathetic activation of this subsystem of touch is what we experience as we anticipate the stealthy approach of the murderous threat to the horror film's unsuspecting protagonist. More broadly speaking, the discovery and exploration of mirror neurons in recent neuroscience research provides a level of physiological confirmation for what Rousseau and Diderot described in the eighteenth century. When we observe someone accomplishing a gesture that we recognize because we have practiced it in our own way, the cluster of neurons that control such movement in us fire in sympathy with the observed gesture: we imitate it with a physiological reaction in neuronal form even if we do not actually perform the gesture we have perceived.

In short, the violinist was describing a version of this extended system of touch made possible by the resonances in the physical gestures that accompany social and cultural interaction: the particular phrasing of the music produced by a concert violinist (intimately tied to the way

she or he moves while playing), the particular and personal brush strokes of a painter, the singular nuance of the way a dancer reproduces a classic ballet step, and so forth. If indeed the earliest social interaction of the neonate is the touch of the mother's skin, this is a prelude to the construction of an extraordinarily complex system of touch, which combines both the immediate contact with objects and people in the world, but also the sympathetic resonances that Rousseau and Diderot described. And the latter accompany any social or cultural interaction in ways that perhaps precondition our receptiveness to the perspectives on the world that others attempt to share with us. The most logical argument imaginable, impregnable from a philosophical perspective, might be deployed in vain if our muscles and our heart react with rejection rather than acceptance because of the gestures and style displayed by our interlocutor. We sometimes catch ourselves thinking (internally) that we simply cannot stomach what is being said and the nuance of how it is being expressed.

Perhaps, then, the terms we so often employ to describe our relations with distant interlocutors in our present world of instant technological communication—contact, touch, reaching out—are not quite as metaphorical as they first seem to be. Our gestures, visible at a distance and deeply embedded in shared resonances, are mediate extensions of immediate physical touch. And thus perhaps research on haptic feedback occasionally takes touch too literally, nostalgic for a time when the world was smaller and we were closer in a different way. Even Jean-Jacques Rousseau, who argued so passionately for small political organizations in which people were able physically to touch each other, understood and ultimately allowed for interactions at a distance beyond physical touch, for the power of shared gestures, «these accents, which make us tremble, these accents, from which we cannot shield our body.»

## NOTAS

- 1 Daniel Heller-Roazen, *The Inner Touch: Archaeology of a Sensation*, Reprint edition (New York; Cambridge, Mass: Zone Books, 2009) contains a wonderfully erudite analysis of the notion of sensation in Aristotle and later classical philosophers.
- 2 Yves Citton, *Gestes d'humanité: Anthropologie sauvage de nos expériences esthétiques* (Paris: Armand Colin, 2012) develops the notion of gesture in detail and is indispensable.